



The 19th International Scientific Conference
“DEFENSE RESOURCES MANAGEMENT
IN THE 21st CENTURY”
Braşov, November 7th-8th 2024



NATIONAL DEFENSE UNIVERSITY „CAROL I”
REGIONAL DEPARTMENT OF DEFENSE RESOURCES
MANAGEMENT STUDIES



DEFENSE RESOURCES MANAGEMENT IN THE 21ST
CENTURY

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ATTENDANCE ORGANIZED BY THE REGIONAL DEPARTMENT OF
DEFENSE RESOURCES MANAGEMENT STUDIES

7th- 8th November 2024, Braşov

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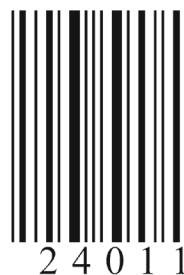
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THE BUDGET MANAGEMENT BY OBJECTIVES IN TUNISIA

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Abstract:

The case of the Republic of Tunisia may be interesting to conduct this type of analysis, since non classified budgetary data for a relatively long time frame, a decade, is available. Furthermore the metamorphosis that occurred in the region emphasized the role of its Armed Force in performing their role in defending the Territory and maintaining its integrity. Since the Revolution for Dignity of 2011, Tunisia has embarked on a considerable transformation of its State and its administrative organization which is also related to its financial management.

The budgetary management by objectives is part of the establishment of a new mode of management of the State budget based on the principle of good governance which aims to improve efficiency and ensure transparency in the execution of the state budget.

Thus, budget management by objective allows for better spending, improve the efficiency of public action and strength of transparency and optimize the financial management of public expenditure.

For this purpose, this paper is organized as follows: the first chapter highlights the Tunisian management reform while the second chapter presents Budget management by objectives. The third and final chapter depicts Budget management by objectives in the Ministry of national Defense.

Key words: management; budgeting; efficiency; transparency;

1. Introduction

For twenty years, the Tunisian State and administration have undertaken a major step towards financial modernization. To overcome the rigidities of the system of public finance, as early as 1996, a decree authorized ministers to set up management units by objectives with a view to carrying out specific projects. This decree led to the establishment of several units intended for the execution of specific projects, such as the construction of a hospital, a university establishment, a dam, or a highway.

A decree in November 2003 established a unit responsible for preparing budget management by objectives for a period of five years. For its part, the organic law of May 2004, modifying the LOB (Law Organic Budget), went in the direction of introducing the concept of management by objectives, based on the allocation of credits according to programs and missions. This evolution aims for the best overall allocation of available resources, and is not irrelevant to the concern for the profitability of public action. Now Article 11, paragraph 2 of the LOB provides that “the finance law may authorize the allocation of credits according to programs and assignments. It being understood that “the programs include the credits allocated to an action or a set of homogeneous actions charged to each head of administration with a view to achieving specific objectives and results that can be evaluated” and that “the missions include a set of concurrent programs to achieve a strategy of national interest”.

This reform really began to be implemented in 2007. Ministries pilots have been designated and some have done remarkable work in a short time mapping (breakdown of the budget into programs) and definition of objectives with performance indicators. The goals of setting up a true BMBO (Budget Management by Objective) include increasing the effectiveness



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of public action, sustaining the pace of development projected within the framework of economic and financial balances. They also tend to better allocate resources according to the orientations and priorities adopted and improve the performance of public expenditure and the clarity of the objectives of the budget.

The Revolution for Dignity of 2011 has clearly revealed the crisis of the model of development and the fragility of the country's public finance situation.

The Tunisian public administration has reflected user dissatisfaction with the quality of services provided and the rise in unemployment among highly qualified workers, the widening of the deficit in the balance of current payments, the increase in public sector debt, the granting of poor-quality loans by the banking sector and the frequent use of credit checks.

As a result, structural reforms are necessary to create the conditions for inclusive and private sector-led growth, as well as to protect the most vulnerable segments of the population. It is time to clean up, as soon as possible, the financial sector and to strengthen the budgetary frameworks and monetary policies, as well as developing a comprehensive program of structural reforms aimed at increasing productivity and making growth more sustainable and inclusive.

The 2014 constitution responded to popular expectations and aspirations through relation to public administration and reflects the desire to transform it into a modern and efficient administration, “at the service of the citizen and the general interest”, which guarantees the right of fair and access to public services, and which respects the principles of good governance under international standards.

This movement of change in public finances appears to be the concrete of the desire expressed to introduce management by objectives into the country (MBO),

Within this framework, our work is to present an overview of the transformation that Tunisia has undergone from the application of a classic administrative and financial system to the budget management by objectives.

2. Tunisian Armed Forces and budget System

In Tunisia has always deemed the choice to keep a small size military. The total force in 2004 was about 35,000 men. Its land forces had a total of 84 tanks, 149 AIFV's, 268 APC's, and 117 pieces of towed artillery. Its air force possessed 29 combat aircraft and 7 attack helicopters as a defensive military power, the naval forces had 6 missile craft and 13 patrol boats. These small equipment assets make Tunisia an exception to the “militarism” of most North African states.

The armed forces are designed for border defense, internal security, and protection of key economic facilities. Some other missions were assigned to the Tunisian military such as disasters relief, participating in economic development through the management of some National projects and professional training.

The Organization is conventional and under command structure, with a Minister of Defense and an Army Chief of Staff, and an army, navy and air force. Logistic support, supply, maintenance services, administrative and financial affairs, military medical services and social welfare are organized in directorates referring directly to the minister of defense (integration).

The newly ratified Tunisian Constitution provides only a few details about the budget process, mainly focusing on the approval stage (Article 66).The different stages of the budget process are described in detail in the Organic Budget Law (OBL) of 2004, which modernized the



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budget management and structure. The 2004 organic budget law provides a detailed description of the rules and procedures governing the budget cycle, sets the rules organizing the legislative review and approval of the proposed budget, the execution of the budget, and budget reporting and government discharge.

The budget is structured around three main categories of expenses, called titles; titles are divided into sections which are also divided into parts:

- Title I or recurrent expenditures and interest on public debt: includes five parts and encompasses recurrent spending (wages, salaries and departments wherewithal) and public debt interest payments. The state's resources for Title I include ordinary fiscal and non-fiscal revenue.
- Title II or expenditures for investment and public debt Reimbursement: includes five parts related to capital investment expenditure and reimbursement of the public debt. State's resources for title II are extraordinary revenue and borrowing.
- Title III: includes the treasury funds and the contribution funds that are budgetary resources designated for specific projects performed by designated departments.

Title I : Recurrent expenditure and interest on public debt	Section 1: recurrent expenditures	Part 1: Public remuneration
		Part 2: Current departments wherewithal
		Part 3: Public contribution
		Part 4: Unexpected expenses
Title II : investment and public debt	Section 2: Interest on public debt	Part 5: Interest on public debt
		Part 6: Direct investment
		Part 7: Public financing
		Part 8: unpredicted development expenses
	Section 3: Capital investment expenditure	Part 9: Development expenses from external resources allocated
Title III : Special Funds	Section 4: Reimbursement of principal public debt	Part 10: Reimbursement of principal public debt
		Part 11: Treasury fund
		Part 12: contribution fund

Table: - Structure of the Tunisian BudgetSystem (Expenditures)-



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Budget Management by Objectives in Tunisian army

MBO stands for **Management by Objectives** and is a framework designed to manage businesses based on their needs and goals. MBO goals are tailored to meet the needs of today's fast-growing businesses and fast-paced work environments.

Management by objectives (MBO) is a process in which a manager and an employee agree on specific performance goals and then develop a plan to reach them. It is designed to align objectives throughout an organization and boost employee participation and commitment.

MBO can help department managers determine the results to be achieved in their departments and what funds are needed to achieve those results. Department managers communicate these needs to administrators via decision packages--packages that in turn enable administrators to make budgeting decisions.

Management by objectives (MBO) is a strategic management model that aims to improve the performance of an organization by clearly defining objectives that are agreed to by both management and employees. According to the theory, having a say in goal setting and action plans encourages participation and commitment among employees, as well as aligning objectives across the organization.

There are five steps: Define objectives, share them with employees, encourage employees to participate, monitor progress, and finally, evaluate performance and reward achievements.

1. Either determine or revise organizational objectives for the entire company. This broad overview should be derived from the firm's mission and vision.
2. Translate the organizational objectives to employees. In 1981, George T. Doran used the acronym SMART (specific, measurable, acceptable, realistic, time-bound) to express the concept.
3. Stimulate the participation of employees in setting individual objectives. After the organization's objectives are shared with employees from the top to the bottom, employees should be encouraged to help set their own objectives to achieve these larger organizational objectives. This gives employees greater motivation since they have greater empowerment.
4. Monitor the progress of employees. In step two, a key component of the objectives was that they are measurable for employees and managers to determine how well they are met.
5. Evaluate and reward employee progress. This step includes honest feedback on what was achieved and not achieved for each employee.

The intent of this study is not to explain the MBO technique in detail but rather to review the basic concept for its relevancy to today's Army management. Nevertheless, it is necessary to briefly discuss the MBO technique in this context. MBO is more than a firm set of rules, procedures or methods for management. It really involves a particular way of thinking about management that adds vitality to the organization by stressing personal involvement throughout the organizational hierarchy. According to Anthony Raia, MBO is one of the better known management techniques to structure a goal setting process in organizations. He posits that MBO is a management philosophy consisting of interdependent and interrelated steps.

Dale McConkey poses a series of questions regarding the organizations to which affirmative answers to some of them might indicate that MBO could be a possible management tool:

1. Does the organization have a mission to perform? Is there a valid reason for it to exist?



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2. Does management have assets (money, people, plant and equipment) entrusted to it?
3. Is management accountable to some person or authority for a return on the assets?
4. Can the operation be planned?
5. Can responsibilities of key personnel be pinpointed?
6. Is it possible to evaluate the performance of key personnel?
7. Is management receptive to improved methods of operation?

The answer to these questions is generally positive in most military organizations. The overall goal of the Army is to maintain combat, combat support and combat service support units and organizations in the highest possible state of combat readiness. To accomplish this each organization has a mission, resources, and a line of authority or chain-of-command where each soldier is accountable to some higher authority. In all cases operations not only can be planned but for the most part depend on a detailed planning process.

The Army has long been in the business of establishing goals to improve the readiness of combat forces and its equipment and supply objectives require management functions similar to those of industry. There are similarities in the type work done by middle and lower managers in the Army and those at comparable levels in other government agencies and in industry.

The annual performance projects (APP) is designed to better reflect the results of the public action, based on a model drawn up by the BMBO unit and the working group on program management based on performance.

The APP contains indicators aimed at monitoring the three dimensions of performance of a program relating to:

- Management efficiency.
- The quality of the services provided to the user.

The ministries drew up the annual performance report at the end of management.

The APP and the APR are presented according to an identical structure in order to facilitate reconciliation of documents. As important as the presentation of the results, the analysis and interpretation of these: explanation of the differences between objectives (or targets) and achievements, weight of the context, new action levers to be mobilized.

In order to prepare the APR, it is important to put in place a method for monitoring and evaluation of APP in the ministries.

Multi-year programming:

Its objectives are:

- ✓ Support the sustainability of public policies by ensuring the compatibility of their future budgetary impact with the financial possibilities of the State.
- ✓ Strengthen the efficiency of the intersectoral allocation of budgetary resources by strengthening the link between sector strategies and the annual budget.
- ✓ Improve operational performance by granting better visibility to managers to manage their programs by providing a medium-term tool for monitoring the performance of public policies.

The new organic budget law is based on medium-term expenditure programming for a period of three years.

The management charter:

The management charter is a document which formalizes the relations between the actors of a program and this by the consultation, the coordination and the engagement which it propels within the chain of responsibility in order to achieve results under the fixed objectives.



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Budget calendar:

The finance law must be prepared according to a calendar set by order of the minister responsible for finance. The latter was published on March 15, 2019. It details the different phases of preparation of the finance law.

Management dialogue:

The new approach to budget management by objectives has just made more precise the different levels of responsibility at the level of the perimeter of each public policy. It creates a new chain of responsibility within the framework of the public administration.

List of information systems:

IS Performance: The head of the mission and The program manager needs to have a dashboard merging the operational results of the structures in charge of the execution of public policies, and giving him the possibility of an instantaneous follow-up of the evolutions relating to the strategic results of the mission and program at which he is accountable.

Enterprise Resources Planning :(ERP):

The ERP aims to standardize the state financial IT system and to comply with the new provisions introduced by the LOB (organic budget law promulgated in February 2019). Concretely, it is a question of simplifying a very heterogeneous existence, grouping several applications by an information system which allows an integrated financial management.

INJEZ: The program manager needs to have instantaneous information about the projects which are inscribed in the (APP). This system can provide an instant report on the financial and physical realization of the projects.

The Programmatic declination and challenges:

The Budget Management According to Objectives Unit was created by Governmental Decree no. 2018-232 dated March 13, 2018, related to the creation of the Objective Management Unit at the Ministry of National Defense to implement a project to develop the management of the state budget and to regulate its organization and methods of operation.

This resulted in a number of tasks assigned during the project completion period, which extend over five years.

1. The Programmatic declination

Since the beginning of its activities, the budget management unit has worked on defining a map of programs that represent public policies that all structures contribute to achieving, including public actors. This process is based on a set of programmatic division rules that set for each program a clear performance framework emanating from the mission strategy and directions for the program in the medium term.



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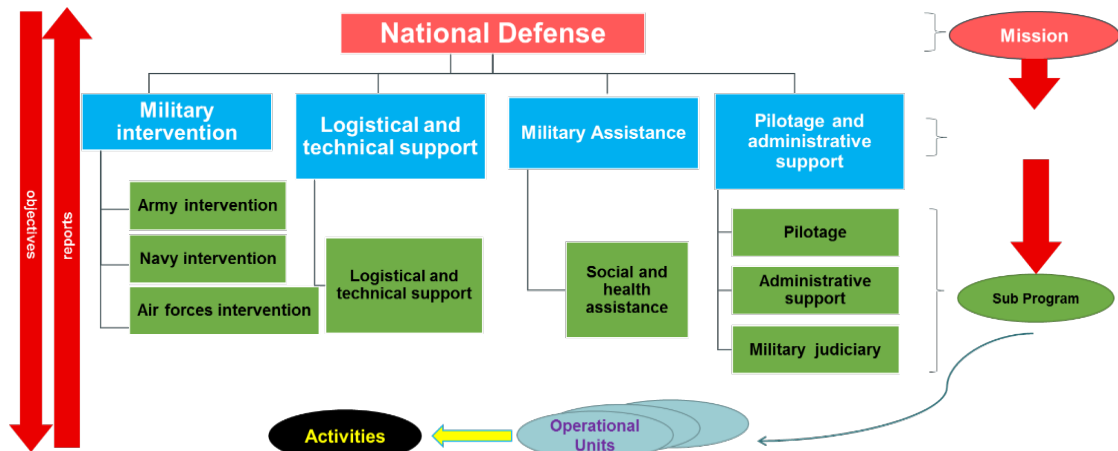


Fig.1: – The programmatic declination,
Source (Ministry of Defense)

The vertical dialogue: between the program manager and the operational managers responsible for its implementation

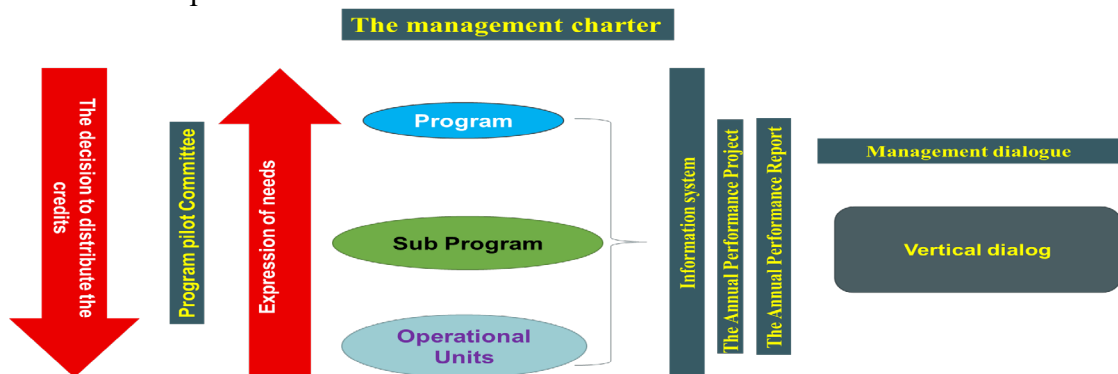


Fig.2: The vertical dialogue,
Source (Ministry of Defense)

The horizontal dialogue: between the program manager and the directors participating in the program or in charge of support services (business financial, human resources, etc.) as well as the authority responsible for monitoring and evaluation.



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Fig.4: – The horizontal dialogue,
Source (Ministry of Defense)

The budget management by objectives challenge:

The focus of an internal control system:

It can be defined as the set of procedures and operations adopted by the different levels of responsibility aimed at reducing the risks that present obstacles to the achievement of the objectives set for any organization.

As part of this new approach, program managers are called to put in place an internal control system, the objective of which is to provide reasonable assurance on the objectives set annually as part of the annual performance project.

The focus of the Ministerial management control Unit:

It has for mission to steer the work of the organization, to monitor the progress and quality of operations, and to evaluate the results and performance of the organization and to provide reasonable assurance that management's objectives are being achieved.

The focus of the internal audit unit:

It's mission is to examine the management processes to ensure that they allow the production of sincere and transparent information.

3.Conclusions

MBO is a useful management technique that has been successfully applied in many areas. It has practical application in both the private and public sectors where it has been credited with improving management performance, management attitudes, and organizational planning. There are, however, some very real constraints that limit MBO in practice. To make MBO work, it takes time and dedicated effort on the part of knowledgeable managers at all levels who are willing to give their full support to the program and also assume a degree of personnel risk. Further, there are many pitfalls, most of which are inherent in improper use of the technique that must be carefully considered before MBO is implemented in any organization. The MBO process has many attractive features which are suitable for Army management at almost any level depending upon the particular organization's missions and functions. Before implementation, the MBO process must be assessed in terms of the many distinctly different types of Army organizations and management environments, as well as the different management/ leadership/command styles involved in running the organization. The Army is simply too large and functionally diverse to implement MBO Army-wide as a matter of policy. One final caution is that any



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management technique used in Army organizations during peacetime must also be functional on the battlefield. If MBO, or any other management technique, fails to meet these criteria, it must be summarily discarded.

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HUMAN RESOURCES IN SCIENCE AND TECHNOLOGY IN EU COUNTRIES – AN OVERVIEW

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Abstract:

In this paper we have analyzed the evolution of the human resources in science and technology (HRST) in EU Countries. This evolution is important for the high-tech industry and knowledge-intensive services, both being part of the Science, Technology and Digital Society branch in the EUROSTAT Database. We studied the absolute chain increment for each country emphasizing the minimum and the maximum values.

Key words: indicator; evolution; absolute chain increment; HRST; EU Countries; trend; education.

1. Introduction

Human Resources in Science and Technology (HRST) encompasses two main categories: people with tertiary education and those working in science and technology jobs that typically require this level of education. HRST is defined by either educational achievement (completion of tertiary education) or occupation (working in science and technology roles that usually demand tertiary-level qualifications), regardless of current job title. The HRST concept covers both individuals who have completed tertiary education and those employed in science and technology positions where such qualifications are typically required, focusing primarily on educational attainment rather than current occupation.

To better study the evolution of people who are part of HRST, we calculated the absolute chain increment over 10 years for EU countries. The formula used was:

$$\Delta Y = Y_i - Y_{i-1} \quad (1)$$

In the tables below the countries are presented using the two letters abbreviation, as follows: EU-27 (European Union 27 countries), AT (Austria), BE (Belgium), BG (Bulgaria), CY (Cyprus), CZ (Czechia), DE (Germany), DK (Denmark), EE (Estonia), EL (Greece), ES (Spain), FI (Finland) FR (France), HR (Croatia), HU (Hungary), IE (Ireland), IT (Italy), LT (Lithuania), LU (Luxembourg), LV (Latvia), MT (Malta), NL (Netherlands), PL (Poland), PT (Portugal), RO (Romania), SE (Sweden), SI (Slovenia), SK (Slovakia).

2. Data analysis

a. Persons with tertiary education (ISCED) and/or employed in science and technology

The first indicator analyzed is the absolute chain increment of the persons with tertiary education and/or employed in science and technology.



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In EU-27, the smallest increase of this indicator was in 2020 compared to 2019 (780.9 thousand people), while the highest increase was in 2023 compared to 2022 (2,859.4 thousand people), in Austria the smallest increase was in 2020 compared to 2019 – 27.3 thousand people and the highest increase was in 2022 compared to 2021 – 91.8 thousand people.

We will now present the maximum and minimum values for all 27 EU countries, separated in 4 tables. We note that the negative values show a decrease in the number of people.

Belgium: -22.3 thousand people in 2015 compared to 2014 and 154.6 thousand people in 2017 compared to 2016 (Table 1a); Bulgaria: -62.2 thousand people in 2019 compared to 2018 and 35.1 thousand people in 2015 compared to 2014; Cyprus: -2 thousand people in 2015 compared to 2014 and 25.7 thousand people in 2023 compared to 2022; Czechia: -38.4 thousand people in 2022 compared to 2021 and 74.2 thousand people in 2021 compared to 2020; Deutschland -233.3 thousand people in 2020 compared to 2019 and 686.6 thousand people in 2016 compared to 2015.

Absolute chain increment	EU-27	AT	BE	BG	CY	CZ	DE
y2015 - y2014	2024.2	44.5	-22.3	35.1	-2	9.5	414.4
y2016 - y2015	2246.8	65.9	38.9	-2	5.1	59.5	686.6
y2017 - y2016	2268.7	55.2	154.6	21.5	7.9	69.5	311.6
y2018 - y2017	2218.1	30.1	50.2	12.1	11.6	41.4	320.6
y2019 - y2018	2572.3	50.2	37.7	-62.2	9.7	-8	638.9
y2020 - y2019	780.9	27.3	94.9	13.6	1.8	23.6	-233.3
y2021 - y2020	2359.1	29.7	133	2.6	15.4	74.2	448.3
y2022 - y2021	2722	91.8	90.4	2.3	13.6	-38.4	399.6
y2023 - y2022	2859.4	72.2	-17.8	17.5	25.7	-0.2	633.1

Table 1a The evolution of number of persons with tertiary education (ISCED) and/or employed in science and technology (thousand persons; from 15 to 74 years; EU-27 – DE)

For the second group of countries, the minimum and maximum values of the absolute chain increment are as follows (Table 1b): Denmark: 12.4 thousand people in 2020 compared to 2019 and 56.7 thousand people in 2017 compared to 2016; Estonia: -3.8 thousand people in 2015 compared to 2014 and 16 thousand people in 2019 compared to 2018; Greece: -11.3 thousand people in 2023 compared to 2022 and 107.7 thousand people in 2022 compared to 2021; Spain: 25.7 thousand people in 2020 compared to 2019 and 409.2 thousand people in 2023 compared to 2022; Finland: -86.7 thousand people in 2021 compared to 2020 and 56.2 thousand people in 2018 compared to 2017; France: 175.3 thousand people in 2017 compared to 2016 and 461.5 thousand people in 2023 compared to 2022; Croatia: -24.5 thousand people in 2019 compared to 2018 and 51.2 thousand people in 2023 compared to 2022.

Absolute chain increment	DK	EE	EL	ES	FI	FR	HR
y2015 - y2014	29.5	-3.8	29.4	240.1	12.9	268.1	19.7
y2016 - y2015	35.5	4.1	80.8	260.2	12.5	245.3	2.3
y2017 - y2016	56.7	11.8	56.7	309.9	36.4	175.3	21.9
y2018 - y2017	39.9	7.2	51.2	299.9	56.2	366	27.6
y2019 - y2018	35.1	16	40.5	369.1	39.6	353.2	-24.5
y2020 - y2019	12.4	-0.3	22.8	25.7	37.1	329.5	0.6
y2021 - y2020	39.4	15.3	84.6	383.8	-86.7	334.9	-2.1
y2022 - y2021	43	12	107.7	382.8	36.4	437.8	2.5
y2023 - y2022	33.9	8.7	-11.3	409.2	16	461.5	51.2



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Table 1b The evolution of number of persons with tertiary education (ISCED) and/or employed in science and technology (thousand persons; from 15 to 74 years; DK – HR)

For the third group of countries (Table 1c), the indicator has the following minimum and maximum values: Hungary: 17.2 thousand people in 2017 compared to 2016 and 146 thousand people in 2021 compared to 2020; Ireland: 28.6 thousand people in 2018 compared to 2017 and 124.4 thousand people in 2021 compared to 2020; Italy: -212.6 thousand people in 2021 compared to 2020 and 512 thousand people in 2023 compared to 2022; Lithuania: -4.9 thousand people in 2017 compared to 2016 and 50.4 thousand people in 2022 compared to 2021; Luxembourg: -8.2 thousand people in 2015 compared to 2014 and 16 thousand people in 2021 compared to 2020; Latvia: -5.8 thousand people in 2023 compared to 2022 and 19.3 thousand people in 2015 compared to 2014; Malta: 4.4 thousand people in 2016 compared to 2015 and 13.4 thousand people in 2018 compared to 2017.

Absolute chain increment	HU	IE	IT	LT	LU	LV	MT
y2015 - y2014	39.7	41.4	163.7	25.6	-8.2	19.3	4.8
y2016 - y2015	25.9	39	146.4	13.7	5.1	5.6	4.4
y2017 - y2016	17.2	60.1	249.5	-4.9	0.7	7.4	9.3
y2018 - y2017	47.8	28.6	157.4	17.7	14.2	4.4	13.4
y2019 - y2018	56.8	45.9	95.8	24.3	13.2	18.2	8.7
y2020 - y2019	67.3	45.7	-115.6	2.2	5.9	1.3	5.7
y2021 - y2020	146	124.4	-212.6	21.4	16	-3.5	7.2
y2022 - y2021	44.4	97.3	221.4	50.4	7.5	13	6.4
y2023 - y2022	32.8	63.1	512	23.6	3.9	-5.8	9.3

Table 1c The evolution of number of persons with tertiary education (ISCED) and/or employed in science and technology (thousand persons; from 15 to 74 years; HU – MT)

The minimum and maximum values of the absolute chain increment indicator for the forth group of countries (Table 1d) are as follows: Netherlands: 70.3 thousand people in 2023 compared to 2022 and 334.3 thousand people in 2021 compared to 2020; Poland: 96.3 thousand people in 2022 compared to 2021 and 547.5 thousand people in 2023 compared to 2022; Portugal: 20.8 thousand people in 2023 compared to 2022 and 110.1 thousand people in 2021 compared to 2020; Romania: -139.9 thousand people in 2023 compared to 2022 and 122.1 thousand people in 2015 compared to 2014; Sweden: 24.8 thousand people in 2021 compared to 2020 and 127.5 thousand people in 2022 compared to 2021; Slovenia: -62.2 thousand people in 2023 compared to 2022 and 41 thousand people in 2021 compared to 2020; Slovakia: -5.8 thousand people in 2023 compared to 2022 and 76.9 thousand people in 2021 compared to 2020.

Absolute chain increment	NL	PL	PT	RO	SE	SI	SK
y2015 - y2014	83.3	237.4	91.1	122.1	87.3	13.4	28.6
y2016 - y2015	94	161.7	74.1	27.6	115.3	10.3	28.8
y2017 - y2016	123.5	249.2	58.7	59.2	89	24.1	37
y2018 - y2017	177.4	192.8	75.8	14.3	104.3	8	47.7
y2019 - y2018	224.7	382.9	59.7	32.1	65.1	10.3	39.4
y2020 - y2019	186	114.7	35.7	-9.6	37.3	26.4	22.5
y2021 - y2020	334.3	197.5	110.1	2.7	24.8	41	76.9
y2022 - y2021	248.3	96.3	76.5	111	127.5	-2.2	43.2



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y2023 - y2022	70.3	547.5	20.8	-139.9	89.7	-62.2	-5.8
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Table 1d The evolution of number of persons with tertiary education (ISCED) and/or employed in science and technology (thousand persons; from 15 to 74 years; NL – SK)

b. Persons with tertiary education (ISCED)

The second indicator analyzed is the absolute chain increment for the number of persons with tertiary education employed in science and technology. In Table 2a we can find the next values – minimum and maximum: EU-27: 1437.4 thousand people in 2020 compared to 2019 and 2604.4 thousand people in 2021 compared to 2020; Austria: 12.4 thousand people in 2020 compared to 2019 and 69.8 thousand people in 2022 compared to 2021; Belgium: -32.5 thousand people in 2023 compared to 2022 and 151.9 thousand people in 2021 compared to 2020; Bulgaria: -51.2 thousand people in 2019 compared to 2018 and 31.9 thousand people in 2015 compared to 2014; Cyprus: -1.8 thousand people in 2015 compared to 2014 and 23.9 thousand people in 2023 compared to 2022; Czechia: -20.5 thousand people in 2023 compared to 2022 and 90.5 thousand people in 2021 compared to 2020; Deutschland: 205.7 thousand people in 2017 compared to 2016 and 574.5 thousand people in 2023 compared to 2022.

Absolute chain increment	EU-27	AT	BE	BG	CY	CZ	DE
y2015 - y2014	1924.1	45.6	1.4	31.9	-1.8	39.6	333.7
y2016 - y2015	1891.6	67.5	46.8	1.5	5.1	54.7	510.2
y2017 - y2016	2045.7	49.3	142.1	9.9	6.9	51.7	205.7
y2018 - y2017	2094.2	22.2	59.5	7.3	11.9	32.8	211.8
y2019 - y2018	2434.7	55.6	20.7	-51.2	9.7	-17.4	476
y2020 - y2019	1437.4	12.4	94.6	20.6	2.4	11.3	226.2
y2021 - y2020	2604.4	31.2	151.9	11.9	14.4	90.5	505.5
y2022 - y2021	2196	69.8	84.8	5.1	13.1	-7.4	217.8
y2023 - y2022	2467.7	67.2	-32.5	13.9	23.9	-20.5	574.5

Table 2a The evolution of number of persons with tertiary education (ISCED) (thousand persons; from 15 to 74 years; EU-27 – DE)

In Table 2b we can distinguish the next minimum and maximum values: Denmark: 17.1 thousand people in 2020 compared to 2019 and 41.5 thousand people in 2019 compared to 2018; Estonia: -3.2 thousand people in 2020 compared to 2019 and 12.4 thousand people in 2021 compared to 2020; Greece: -29.3 thousand people in 2023 compared to 2022 and 87.5 thousand people in 2021 compared to 2020; Spain: 71.1 thousand people in 2020 compared to 2019 and 380.6 thousand people in 2021 compared to 2020; Finland: -119.1 thousand people in 2021 compared to 2020 and 45 thousand people in 2018 compared to 2017; France: 224.2 thousand people in 2017 compared to 2016 and 552.9 thousand people in 2021 compared to 2020; Croatia: -25.8 thousand people in 2019 compared to 2018 and 52.2 thousand people in 2023 compared to 2022.

Absolute chain increment	DK	EE	EL	ES	FI	FR	HR
y2015 - y2014	41.1	-2.6	36.8	194.5	15.5	272	23.9
y2016 - y2015	23.5	4.4	67.3	241.7	9.1	284.1	5.2
y2017 - y2016	32.9	7.8	52.5	271.5	30.5	224.2	19.1
y2018 - y2017	37.2	2.6	61.7	298.4	45	441.4	28.4
y2019 - y2018	41.5	9	33.8	367.1	35	409.1	-25.8



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y2020 - y2019	17.1	-3.2	18.7	71.1	37.4	389.8	6.1
y2021 - y2020	40	12.4	87.5	380.6	-119.1	552.9	2.8
y2022 - y2021	35.6	11.9	81.9	337.3	26.8	387.5	6.6
y2023 - y2022	37	8.3	-29.3	359.4	5.3	328.9	52.2

Table 2b The evolution of number of persons with tertiary education (ISCED)
(thousand persons; from 15 to 74 years; DK – HR)

In Table 2c we have the following minimum and maximum values: Hungary: 5 thousand people in 2016 compared to 2015 and 163.3 thousand people in 2021 compared to 2020; Ireland: 27.1 thousand people in 2018 compared to 2017 and 113.4 thousand people in 2021 compared to 2020; Italy: 0.1 thousand people in 2020 compared to 2019 and 396.9 thousand people in 2023 compared to 2022; Lithuania: -1.7 thousand people in 2017 compared to 2016 and 43.4 thousand people in 2022 compared to 2021; Luxembourg: -11 thousand people in 2017 compared to 2016 and 29.9 thousand people in 2018 compared to 2017; Latvia: -1 thousand people in 2023 compared to 2022 and 16.6 thousand people in 2016 compared to 2015; Malta: 2.7 thousand people in 2016 compared to 2015 and 10.4 thousand people in 2018 compared to 2017.

Absolute chain increment	HU	IE	IT	LT	LU	LV	MT
y2015 - y2014	45.3	49.1	190.6	26.2	-10.6	13.8	2.9
y2016 - y2015	5	27.4	119.5	16.8	-0.7	16.6	2.7
y2017 - y2016	6.7	57.3	314.3	-1.7	-11	1.5	7
y2018 - y2017	53.1	27.1	175.2	17.4	29.9	6.3	10.4
y2019 - y2018	42.7	27.7	101.5	28.7	14.8	13.3	8
y2020 - y2019	48.4	54.4	0.1	4.6	3	6.4	6.3
y2021 - y2020	163.3	113.4	49.1	16	16.6	2.1	5
y2022 - y2021	25.8	94.7	127.9	43.4	9.3	7.2	4.2
y2023 - y2022	17.1	54.1	396.9	8.3	4.5	-1	9.6

Table 2c The evolution of number of persons with tertiary education (ISCED)
(thousand persons; from 15 to 74 years; HU – MT)

Table 2d show us the next minimum and maximum values: Netherlands: 23.8 thousand people in 2023 compared to 2022 and 204.7 thousand people in 2022 compared to 2021; Poland: 91.7 thousand people in 2022 compared to 2021 and 650.6 thousand people in 2023 compared to 2022 Portugal: 32.6 thousand people in 2020 compared to 2019 and 105.3 thousand people in 2021 compared to 2020; Romania: -127.3 thousand people in 2023 compared to 2022 and 135.7 thousand people in 2015 compared to 2014; Sweden: 24.9 thousand people in 2020 compared to 2019 and 121.6 thousand people in 2022 compared to 2021; Slovenia: -59.1 thousand people in 2023 compared to 2022 and 36.1 thousand people in 2021 compared to 2020; Slovakia: -5.2 thousand people in 2023 compared to 2022 and 62.4 thousand people in 2021 compared to 2020.

Absolute chain increment	NL	PL	PT	RO	SE	SI	SK
y2015 - y2014	84	176.5	61.1	135.7	71.9	17.3	28.4
y2016 - y2015	55.6	123.9	59.3	11.6	97.9	8.1	27.2
y2017 - y2016	134.3	224.8	41.3	42.2	63	24.2	37.5
y2018 - y2017	128.4	167.7	73.6	4	93.8	5.8	41.2
y2019 - y2018	193	390.9	73.3	57.7	66.1	11.7	42.3



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y2020 - y2019	200.8	121.2	32.6	-12.8	24.9	30.1	13
y2021 - y2020	118.8	93	105.3	-23	83.9	36.1	62.4
y2022 - y2021	204.7	91.7	73	77.6	121.6	-1.4	45.2
y2023 - y2022	23.8	650.6	38.4	-127.3	68.8	-59.1	-5.2

Table 2d The evolution of number of persons with tertiary education (ISCED)
(thousand persons; from 15 to 74 years; NL – SK)

c. Persons employed in science and technology

The third indicator analyzed is the absolute chain increment of the persons employed in science and technology in tables 3a to 3d. The minimum and the maximum values are as follows: EU-27: 247.7 thousand people in 2020 compared to 2019 and 2344 thousand people in 2023 compared to 2022; Austria: 16.2 thousand people in 2019 compared to 2018 and 62.5 thousand people in 2023 compared to 2022; Belgium: -9.6 thousand people in 2015 compared to 2014 and 115.1 thousand people in 2017 compared to 2016; Bulgaria: -34 thousand people in 2019 compared to 2018 and 31.9 thousand people in 2015 compared to 2014; Cyprus: -2.9 thousand people in 2015 compared to 2014 and 20.1 thousand people in 2023 compared to 2022; Czechia: -45.7 thousand people in 2022 compared to 2021 and 61.9 thousand people in 2017 compared to 2016; Deutschland: -769.3 thousand people in 2020 compared to 2019 and 718.1 thousand people in 2021 compared to 2020.

Absolute chain increment	EU-27	AT	BE	BG	CY	CZ	DE
y2015 - y2014	1445.7	22.9	-9.6	31.9	-2.9	-6.6	360.4
y2016 - y2015	1702.9	34.9	21.8	-0.2	-0.4	50.5	507.6
y2017 - y2016	1520.1	42.7	115.1	10.9	7.9	61.9	233.2
y2018 - y2017	1547.7	39.8	34.2	13.9	6.7	34	262.6
y2019 - y2018	1924.5	16.2	25	-34	3.4	-4.3	503.4
y2020 - y2019	247.7	32.8	67	20	2.8	40.1	-769.3
y2021 - y2020	2100.6	21.1	58	12.3	13.8	46	718.1
y2022 - y2021	1782.9	60.2	50.1	-10.8	8.7	-45.7	328
y2023 - y2022	2344	62.5	-0.2	16.7	20.1	15.7	463

Table 3a The evolution of number of persons employed in science and technology (thousand persons; from 15 to 74 years; EU-27 – DE)

From Table 3b we extracted the minimum and the maximum values: Denmark: -3.9 thousand people in 2021 compared to 2020 and 44.7 thousand people in 2022 compared to 2021; Estonia: -3.7 thousand people in 2015 compared to 2014 and 21.7 thousand people in 2021 compared to 2020; Greece: 7.8 thousand people in 2023 compared to 2022 and 68.6 thousand people in 2022 compared to 2021; Spain: 74.5 thousand people in 2020 compared to 2019 and 317.3 thousand people in 2023 compared to 2022; Finland: -74.4 thousand people in 2021 compared to 2020 and 56.4 thousand people in 2020 compared to 2019; France: 80.6 thousand people in 2017 compared to 2016 and 513.3 thousand people in 2023 compared to 2022; Croatia: -16 thousand people in 2019 compared to 2018 and 40.2 thousand people in 2023 compared to 2022.

Absolute chain increment	DK	EE	EL	ES	FI	FR	HR
y2015 - y2014	7.6	-3.7	17	138.3	1.8	198	6.3
y2016 - y2015	28.3	4.6	43.2	216.2	7	181	1.7
y2017 - y2016	44.5	13.5	19.2	158.5	37.5	80.6	17.1



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y2018 - y2017	38.2	6.7	14.2	153.5	43.3	191.1	19.8
y2019 - y2018	24.3	12.9	22.6	272.4	41	195.8	-16
y2020 - y2019	17.9	3.8	47.3	74.5	56.4	236.3	4
y2021 - y2020	-3.9	21.7	21.4	190.3	-74.4	459	-7.4
y2022 - y2021	44.7	7.2	68.6	198.1	39.5	249.4	-0.9
y2023 - y2022	28.1	7.3	7.8	317.3	11.8	513.3	40.2

Table 3b The evolution of number of persons employed in science and technology (thousand persons; from 15 to 74 years; DK – HR)

Next minimum and maximum values of this indicator are in Table 3c and are as follows: Hungary: 13.9 thousand people in 2022 compared to 2021 and 105.7 thousand people in 2021 compared to 2020; Ireland: 19.8 thousand people in 2018 compared to 2017 and 78.3 thousand people in 2021 compared to 2020; Italia: -281.1 thousand people in 2021 compared to 2020 and 422.5 thousand people in 2023 compared to 2022; Lithuania: -6.8 thousand people in 2015 compared to 2014 and 36.2 thousand people in 2022 compared to 2021; Luxembourg: -6.2 thousand people in 2015 compared to 2014 and 10.2 thousand people in 2018 compared to 2017; Latvia: -10.9 thousand people in 2023 compared to 2022 and 16.6 thousand people in 2015 compared to 2014; Malta: 3.1 thousand people in 2021 compared to 2020 and 7.9 thousand people in 2018 compared to 2017.

Absolute chain increment	HU	IE	IT	LT	LU	LV	MT
y2015 - y2014	19.4	26.2	79.7	-6.8	-6.2	16.6	4.1
y2016 - y2015	21.5	30.2	133.5	8.4	1.7	7.6	3.5
y2017 - y2016	21.9	26.2	141.2	-5.1	3.4	-0.7	5.3
y2018 - y2017	27.7	19.8	93.1	9.1	10.2	-6.6	7.9
y2019 - y2018	69.6	37.8	102.7	7.5	9.3	13.2	6.1
y2020 - y2019	79.3	34.2	-95.9	10.5	7.1	7.5	4.3
y2021 - y2020	105.7	78.3	-281.1	23.3	10	-7	3.1
y2022 - y2021	13.9	54.2	110	36.2	4.2	13.8	4.3
y2023 - y2022	16.5	47.4	422.5	27.1	8.3	-10.9	4.1

Table 3c The evolution of number of persons employed in science and technology (thousand persons; from 15 to 74 years; HU – MT)

Table 3d shows the next minimum and maximum values: Netherlands: 63.3 thousand people in 2017 compared to 2016 and 340.2 thousand people in 2021 compared to 2020; Poland: 22.7 thousand people in 2022 compared to 2021 and 299.3 thousand people in 2023 compared to 2022; Portugal: -13.7 thousand people in 2023 compared to 2022 and 85.2 thousand people in 2015 compared to 2014; Romania: -77.9 thousand people in 2023 compared to 2022 and 79.1 thousand people in 2015 compared to 2014; Sweden: 2.5 thousand people in 2021 compared to 2020 and 116 thousand people in 2022 compared to 2021; Slovenia: -50.9 thousand people in 2023 compared to 2022 and 47 thousand people in 2021 compared to 2020; Slovakia: 0.6 thousand people in 2023 compared to 2022 and 44.5 thousand people in 2021 compared to 2020.

Absolute chain increment	NL	PL	PT	RO	SE	SI	SK
y2015 - y2014	88.4	214.3	85.2	79.1	75.3	3.7	5.2
y2016 - y2015	134.7	60.9	50.1	39.7	90	8.7	16.4
y2017 - y2016	63.3	195.4	52.2	62.4	66.7	21.8	23.4



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y2018 - y2017	178.2	178.3	52.6	5.6	81.9	5.1	26.8
y2019 - y2018	157.6	293.1	20.6	43.2	62.3	8	30.5
y2020 - y2019	147.6	101.3	64.8	-26.2	46.5	17.6	16.1
y2021 - y2020	340.2	183.6	53.6	20.5	2.5	47	44.5
y2022 - y2021	244.5	22.7	62.5	69.5	116	-0.1	34
y2023 - y2022	80.7	299.3	-13.7	-77.9	87.6	-50.9	0.6

Table 3d The evolution of number of persons employed in science and technology (thousand persons; from 15 to 74 years; NL – SK)

d. Persons with tertiary education (ISCED) and employed in science and technology

The forth indicator analyzed is the absolute chain increment for the number of persons with tertiary education and employed in science and technology. The minimum and maximum values for each country are presented in Tables 4a to 4d: EU-27: 904.1 thousand people in 2020 compared to 2019 and 2345.9 thousand people in 2021 compared to 2020; Austria: 17.8 thousand people in 2020 compared to 2019 and 57.5 thousand people in 2023 compared to 2022 Belgium: -14.9 thousand people in 2023 compared to 2022 and 102.8 thousand people in 2017 compared to 2016; Bulgaria: -23 thousand people in 2019 compared to 2018 and 28.6 thousand people in 2015 compared to 2014; Cyprus: -2.7 thousand people in 2015 compared to 2014 and 18.3 thousand people in 2023 compared to 2022; Czechia: -14.7 thousand people in 2022 compared to 2021 and 62.3 thousand people in 2021 compared to 2020; Deutschland: -309.9 thousand people in 2020 compared to 2019 and 775.4 thousand people in 2021 compared to 2020.

Absolute chain increment	EU-27	AT	BE	BG	CY	CZ	DE
y2015 - y2014	1345.6	24	14	28.6	-2.7	23.5	279.8
y2016 - y2015	1347.8	36.5	29.6	3.5	-0.4	45.7	331.2
y2017 - y2016	1297	36.8	102.8	-0.9	7	44.1	127.3
y2018 - y2017	1423.7	31.9	43.4	9.2	6.9	25.5	153.8
y2019 - y2018	1787.1	21.6	8.1	-23	3.5	-13.7	340.5
y2020 - y2019	904.1	17.8	66.6	27	3.4	27.7	-309.9
y2021 - y2020	2345.9	22.7	76.9	21.6	12.7	62.3	775.4
y2022 - y2021	1257	38.1	44.6	-7.9	8.2	-14.7	146.1
y2023 - y2022	1952.2	57.5	-14.9	13	18.3	-4.6	404.5

Table 4a The evolution of number of persons with tertiary education (ISCED) and employed in science and technology (thousand persons; from 15 to 74 years; EU-27 – DE)

The minimum and maximum values for the next countries are: Denmark: -3.3 thousand people in 2021 compared to 2020 and 37.5 thousand people in 2022 compared to 2021; Estonia: -2.5 thousand people in 2015 compared to 2014 and 18.9 thousand people in 2021 compared to 2020; Greece: -10.1 thousand people in 2023 compared to 2022 and 43.2 thousand people in 2020 compared to 2019; Spain: 92.7 thousand people in 2015 compared to 2014 and 270.5 thousand people in 2019 compared to 2018; Finland: -106.8 thousand people in 2021 compared to 2020 and 56.7 thousand people in 2020 compared to 2019; France: 129.6 thousand people in 2017 compared to 2016 and 677 thousand people in 2021 compared to 2020; Croatia: -17.5 thousand people in 2019 compared to 2018 and 41.2 thousand people in 2023 compared to 2022.



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Absolute chain increment	DK	EE	EL	ES	FI	FR	HR
y2015 - y2014	19.2	-2.5	24.6	92.7	4.4	201.8	10.5
y2016 - y2015	16.3	4.8	29.5	197.7	3.4	219.8	4.6
y2017 - y2016	20.8	9.6	15.1	120.1	31.7	129.6	14.3
y2018 - y2017	35.3	2	24.7	152	32	266.6	20.7
y2019 - y2018	30.8	6	15.9	270.5	36.5	251.6	-17.5
y2020 - y2019	22.5	0.8	43.2	119.8	56.7	296.6	9.7
y2021 - y2020	-3.3	18.9	24.2	187.1	-106.8	677	-2.6
y2022 - y2021	37.5	7.2	42.9	152.6	29.9	199.1	3.2
y2023 - y2022	31.1	6.7	-10.1	267.5	1	380.6	41.2

Table 4b The evolution of number of persons with tertiary education (ISCED) and employed in science and technology (thousand persons; from 15 to 74 years; DK – HR)

Table 4c shows the following minimum and maximum values: Hungary: -4.8 thousand people in 2022 compared to 2021 and 123.1 thousand people in 2021 compared to 2020; Ireland: 18.3 thousand people in 2018 compared to 2017 and 67.3 thousand people in 2021 compared to 2020; Italia: -19.5 thousand people in 2021 compared to 2020 and 307.3 thousand people in 2023 compared to 2022; Lithuania: -6.1 thousand people in 2015 compared to 2014 and 29.4 thousand people in 2022 compared to 2021; Luxembourg: -8.6 thousand people in 2015 compared to 2014 and 26 thousand people in 2018 compared to 2017; Latvia: -6.7 thousand people in 2017 compared to 2016 and 18.6 thousand people in 2016 compared to 2015; Malta: 0.9 thousand people in 2021 compared to 2020 and 5.4 thousand people in 2019 compared to 2018.

Absolute chain increment	HU	IE	IT	LT	LU	LV	MT
y2015 - y2014	25.1	33.9	106.6	-6.1	-8.6	11	2.4
y2016 - y2015	0.4	18.5	106.7	11.4	-4.1	18.6	1.8
y2017 - y2016	11.5	23.5	206	-1.8	-8.4	-6.7	2.9
y2018 - y2017	33	18.3	110.8	8.7	26	-4.7	4.9
y2019 - y2018	55.5	19.6	108.4	12	10.8	8.4	5.4
y2020 - y2019	60.4	42.9	19.8	12.8	4.2	12.6	4.9
y2021 - y2020	123.1	67.3	-19.5	17.8	10.6	-1.4	0.9
y2022 - y2021	-4.8	51.6	16.6	29.4	6.1	8.1	2.1
y2023 - y2022	0.7	38.4	307.3	11.7	8.9	-6.2	4.4

Table 4c The evolution of number of persons with tertiary education (ISCED) and employed in science and technology (thousand persons; from 15 to 74 years; HU – MT)

In Table 4d we can find the next minimum and maximum values: Netherlands: 34.2 thousand people in 2023 compared to 2022 and 200.8 thousand people in 2022 compared to 2021; Poland: 18.1 thousand people in 2022 compared to 2021 and 402.3 thousand people in 2023 compared to 2022; Portugal: 3.7 thousand people in 2023 compared to 2022 and 61.6 thousand people in 2020 compared to 2019; Romania: -65.3 thousand people in 2023 compared to 2022 and 92.7 thousand people in 2015 compared to 2014; Sweden: 34 thousand people in 2020 compared to 2019 and 110 thousand people in 2022 compared to 2021; Slovenia: -48 thousand people in 2023 compared to 2022 and 42 thousand people in 2021 compared to 2020; Slovakia: 1.3 thousand people in 2023 compared to 2022 and 36 thousand people in 2022 compared to 2021.



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Absolute chain increment	NL	PL	PT	RO	SE	SI	SK
y2015 - y2014	89.1	153.4	55.2	92.7	60	7.7	5.1
y2016 - y2015	96.3	23.2	35.3	23.7	72.6	6.6	14.7
y2017 - y2016	74.2	171	34.8	45.4	40.7	21.8	23.9
y2018 - y2017	129.2	153.1	50.3	-4.7	71.5	2.8	20.4
y2019 - y2018	125.8	301.1	34.3	68.8	63.2	9.5	33.4
y2020 - y2019	162.4	107.9	61.6	-29.4	34	21.3	6.6
y2021 - y2020	124.8	79.1	48.8	-5.2	61.8	42	29.9
y2022 - y2021	200.8	18.1	59.2	36.1	110	0.9	36
y2023 - y2022	34.2	402.3	3.7	-65.3	66.7	-48	1.3

Table 4d The evolution of number of persons with tertiary education (ISCED) and employed in science and technology (thousand persons; from 15 to 74 years; NL – SK)

e. Scientists and engineers

The fifth and last indicator analyzed is the absolute chain increment for the number of scientists and engineers employed in science and technology. The minimum and the maximum values for the first group of countries are as follows (Table 1a): EU-27: 298.5 thousand people in 2015 compared to 2014 and 1175.3 thousand people in 2021 compared to 2020; Austria: -2.2 thousand people in 2019 compared to 2018 and 119.7 thousand people in 2018 compared to 2017; Belgium: -5.5 thousand people in 2023 compared to 2022 and 40.7 thousand people in 2017 compared to 2016; Bulgaria: -9.9 thousand people in 2019 compared to 2018 and 14.3 thousand people in 2022 compared to 2021; Cyprus: 0.2 thousand people in 2016 compared to 2015 and 7.3 thousand people in 2023 compared to 2022; Czechia: 2.4 thousand people in 2017 compared to 2016 and 21.4 thousand people in 2021 compared to 2020; Deutschland: 5 thousand people in 2018 compared to 2017 and 295 thousand people in 2021 compared to 2020.

Absolute chain increment	EU-27	AT	BE	BG	CY	CZ	DE
y2015 - y2014	298.5	19.7	16.4	9.2	0.8	19.5	87.8
y2016 - y2015	490.4	10.1	32.4	-3.2	0.2	8.5	169.7
y2017 - y2016	420.2	11.1	40.7	4.1	3.9	2.4	54
y2018 - y2017	570.8	119.7	7.1	9.6	1.3	14	5
y2019 - y2018	700.5	-2.2	15.1	-9.9	0.5	14.7	94.5
y2020 - y2019	614.3	5.9	16.5	9	0.6	18.8	74.3
y2021 - y2020	1175.3	14.7	30.2	-2.8	5	21.4	295
y2022 - y2021	612.9	22.5	-2.4	14.3	7.2	6.3	68.5
y2023 - y2022	882.1	16.1	-5.5	13.8	7.3	15.6	158.5

Table 5a The evolution of number of scientists and engineers (thousand persons; from 15 to 74 years; EU-27 – DE)

For the next group of countries the minimum and maximum values of the indicator are (Table 5b): Denmark: -1.5 thousand people in 2015 compared to 2014 and 16.9 thousand people in 2016 compared to 2015; Estonia: 0.3 thousand people in 2017 compared to 2016 and 7.7 thousand people in 2022 compared to 2021; Greece: -3.1 thousand people in 2015 compared to 2014 and 49.5 thousand people in 2022 compared to 2021; Spain: 19.5 thousand people in 2015 compared to 2014 and 152.8 thousand people in 2023 compared to 2022; Finland: -31.1 thousand people in 2021 compared to 2020



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and 33 thousand people in 2020 compared to 2019; France: -15.3 thousand people in 2015 compared to 2014 and 443.6 thousand people in 2021 compared to 2020; Croatia: -5.4 thousand people in 2015 compared to 2014 and 14.6 thousand people in 2018 compared to 2017.

Absolute chain increment	DK	EE	EL	ES	FI	FR	HR
y2015 - y2014	-1.5	3.8	-3.1	19.5	6.8	-15.3	-5.4
y2016 - y2015	16.9	2	21.1	70.9	2.2	48.3	-2.2
y2017 - y2016	9.1	0.3	12.9	42.6	14.4	33.8	6.2
y2018 - y2017	13.4	1	-1.9	31.3	12.1	61.5	14.6
y2019 - y2018	13	7.5	4.5	80.3	16.6	97.8	1.6
y2020 - y2019	4.8	1.1	21.2	57.1	33	170	8
y2021 - y2020	5.3	5.5	28.9	25.3	-31.1	443.6	-3.6
y2022 - y2021	9.2	7.7	49.5	21.5	14.2	83.3	0.8
y2023 - y2022	12.7	2.9	13.2	152.8	-1.7	236.7	9.7

Table 5b The evolution of number of scientists and engineers
(thousand persons; from 15 to 74 years; DK – HR)

The minimum and maximum values of the indicator for the next group of countries are (Table 5c): Hungary: -10.2 thousand people in 2023 compared to 2022 and 54.9 thousand people in 2020 compared to 2019; Ireland: 5.2 thousand people in 2015 compared to 2014 and 26 thousand people in 2021 compared to 2020; Italia: -9.2 thousand people in 2021 compared to 2020 and 87.3 thousand people in 2023 compared to 2022; Lithuania: -0.2 thousand people in 2020 compared to 2019 and 14.9 thousand people in 2021 compared to 2020; Luxembourg: -2.6 thousand people in 2015 compared to 2014 and 6 thousand people in 2021 compared to 2020; Latvia: -0.4 thousand people in 2018 compared to 2017 and 9.7 thousand people in 2022 compared to 2021; Malta: 0.2 thousand people in 2020 compared to 2019 and 4.1 thousand people in 2019 compared to 2018.

Absolute chain increment	HU	IE	IT	LT	LU	LV	MT
y2015 - y2014	11.8	5.2	20.8	3	-2.6	-0.4	0.7
y2016 - y2015	0.1	8.4	20.9	1.6	1.1	1.5	2
y2017 - y2016	9.2	17.9	5.1	1.9	1.7	1.8	1.9
y2018 - y2017	16.1	7.3	41.6	4.5	1.7	-0.4	2.2
y2019 - y2018	24.7	9	42.4	5.7	3.9	2.1	4.1
y2020 - y2019	54.9	12.6	-8.2	-0.2	0.9	6.7	0.2
y2021 - y2020	9.7	26	-9.2	14.9	6	0.2	2.2
y2022 - y2021	-3.5	23.3	1.3	10.8	0.4	9.7	0.5
y2023 - y2022	-10.2	25.5	87.3	12.1	1.5	3.5	1.8

Table 5c The evolution of number of scientists and engineers
(thousand persons; from 15 to 74 years; HU – MT)

For the last group of countries (Table 5d) we have the next minimum and maximum values of the indicator: Netherlands: 5.8 thousand people in 2023 compared to 2022 and 142.7 thousand people in 2021 compared to 2020; Poland: 4.8 thousand people in 2016 compared to 2015 and 153.9 thousand people in 2023 compared to 2022; Portugal: -27.2 thousand people in 2021 compared to 2020 and 43.2 thousand people in 2020 compared to 2019; Romania: -54.4 thousand people in 2023 compared to 2022 and 45 thousand people in 2022 compared to 2021; Sweden: -4.2 thousand people in 2023 compared to



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2022 and 54.2 thousand people in 2022 compared to 2021; Slovenia: -18 thousand people in 2023 compared to 2022 and 20.8 thousand people in 2021 compared to 2020; Slovakia: -3.5 thousand people in 2015 compared to 2014 and 13.1 thousand people in 2020 compared to 2019.

Absolute chain increment	NL	PL	PT	RO	SE	SI	SK
y2015 - y2014	27.5	10.2	21.3	14.3	23.2	9.3	-3.5
y2016 - y2015	17.5	4.8	6.1	15.1	36.7	-1.2	-1.5
y2017 - y2016	21.5	56.2	22.3	13.1	19.5	1	11.9
y2018 - y2017	61.8	51	37.4	13.4	30.9	5	9.4
y2019 - y2018	66.8	113.5	35	5.9	40.9	2.1	10.1
y2020 - y2019	31.3	10.5	43.2	0	19.8	9.8	13.1
y2021 - y2020	142.7	70.8	-27.2	31.7	44.8	20.8	4.2
y2022 - y2021	91.8	28.5	37.2	45	54.2	0.6	10.4
y2023 - y2022	5.8	153.9	33.4	-54.4	-4.2	-18	12.1

Table 5d The evolution of number of scientists and engineers
(thousand persons; from 15 to 74 years; NL – SK)

3. Conclusions

Concerning the evolution of number of *persons with tertiary education (ISCED) and/or employed in science and technology* we can draw the following conclusions:

Overall EU-27 Trends: steady growth from 2014 to 2019 (2000-2500K annual increase), sharp decline in 2020 (780.9K) due to pandemic, strong recovery post-2020, reaching highest growth in 2023 (2859.4K).

Major Country Contributors: Germany (DE): largest volatility (-233.3K to +686.6K); France (FR): most consistent growth (175.3K to 461.5K); Poland (PL): dramatic recent growth (547.5K in 2023); Spain (ES): steady upward trend (240.1K to 409.2K).

Regional Patterns: Western Europe: generally stable growth (FR, DE), Eastern Europe: more volatile (PL, RO), Southern Europe: mixed performance (ES positive, IT variable), Northern Europe: moderate, steady growth (SE, DK).

Impact Periods: Pre-pandemic (2014-2019): stable growth across most countries; Pandemic (2019-2020): universal slowdown or decline; Recovery (2020-2023): varied recovery patterns: strong: PL, FR, ES; moderate: DE, NL; weak: some smaller countries.

Country Size Impact: larger countries (DE, FR, ES, PL) show larger absolute changes, smaller countries (MT, LU, CY) show more modest but often stable growth, medium-sized countries show varied patterns.

Key findings from the *tertiary education* data: Overall EU-27 Trends: generally positive growth throughout the period; notable dip in 2019-2020 (1437.4K vs. 2434.7K previous year); strong recovery in 2020-2021 (2604.4K); relatively stable in recent years around 2200-2500K annual increase.

Country-Specific Patterns: Major Contributors: Poland (PL): dramatic increase in 2022-2023 (650.6K), previously showing declining trend, high volatility in numbers; Germany (DE): consistent contributor, strong performance in 2022-2023 (574.5K), relatively stable pattern with periodic peaks; France (FR): steady growth, peak in 2020-2021 (552.9K), generally stable



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contributor; Italy (IT): highly variable pattern, near-zero growth in 2019-2020, strong recovery in 2022-2023 (396.9K).

Regional Patterns: Northern Europe: Sweden: moderate but stable growth; Denmark: consistent small positive increments; Eastern Europe: notable volatility (Poland, Romania), Romania showing recent decline (-127.3K in 2023); Southern Europe: Spain: strong consistent growth; Italy: volatile but generally positive; Western Europe: France and Germany: most stable large contributors; Netherlands: consistent growth until recent slowdown.

Pandemic Impact and Recovery: clear impact in 2019-2020 across most countries; variable recovery patterns: some immediate (France), some delayed (Italy), some still struggling (Romania).

Recent Trends (2022-2023): strong positive: Poland (650.6K), Germany (574.5K), Italy (396.9K); negative trends: Romania (-127.3K), Slovenia (-59.1K), Slovakia (-5.2K); mixed performance in smaller countries.

Based on the data and visualization on *persons employed in science and technology*, here are some key observations: Overall EU-27 Trend: shows generally positive growth with significant year-to-year variations; largest increase was in 2023 (+2,344,000 persons); Notable dip in 2020 (likely due to COVID-19 pandemic) with only +247,700 increase.

Major Country Patterns: Germany (DE) showed high volatility, with a major decrease in 2020 (-769,300); France (FR) has shown consistent growth, particularly strong in recent years; Italy (IT) experienced significant fluctuations, including negative growth in 2020-2021; Poland (PL) shows variable but generally positive growth.

Notable Events: 2020 impact: many countries showed reduced or negative growth; strong recovery: most countries showed significant rebounds in 2021-2023; Recent trends: 2023 showed particularly strong growth in several countries.

Conclusions after analyzing the number of *persons with tertiary education (ISCED) and employed in science and technology*: Education Level Trends: a large proportion of new science and technology jobs are filled by those with tertiary education; the gap between total and tertiary-educated employment growth varies by country and year; in some cases, tertiary-educated growth exceeds total growth, suggesting possible job requirement upgrades.

Country-Specific Patterns: Germany (DE): shows similar patterns in both datasets but with smaller amplitude in tertiary education; France (FR): often shows higher growth in tertiary-educated positions than total positions; Poland (PL): shows strong growth in tertiary education, particularly in 2023 (+402,300).

Crisis and Recovery: 2020 (COVID-19 impact): tertiary-educated positions were more resilient, showing positive growth (+904,100) while total employment growth was much lower (+247,700); 2021 recovery: both categories showed strong growth, with tertiary education growing even more than total employment.

Recent Trends (2022-2023): most countries show continued growth in both categories; the proportion of tertiary-educated workers continues to increase; some countries (e.g., Slovenia, Latvia) show recent decreases in both categories.

Key findings from analyzing *scientists and engineers* data in comparison with previous datasets: Overall Trends: scientists and engineers show more stable growth compared to total S&T employment; the number of scientists and engineers was less affected by the 2020 crisis, showing continuous positive growth (+614,300); the proportion of scientists and engineers within total S&T employment has been increasing.



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Country-Specific Patterns: France shows strong recent growth in scientists/engineers (+236,700 in 2023); Germany maintains steady growth but with more moderate numbers; Poland shows significant increase in 2023 (+153,900); some smaller countries show decline or stagnation (Hungary, Slovenia).

Notable Changes: 2021 saw the largest increase (+1,175,300 EU-wide); most recent data (2023) shows strong growth (+882,100); several countries show contrasting patterns between total S&T employment and scientists/engineers.

Regional Variations: Western European countries generally show more stable growth; Eastern European countries show more volatile patterns; Southern European countries (especially Spain and Italy) show recent strong growth.

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**BUDGET RESOURCES MANAGEMENT: THE TUNISIAN
BUDGET MANAGEMENT APPROACH IN THE DEFENSE
CONTEXT**

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Abstract:

In historical terms, defense management emerged as a topic of interest for the defense sector not too long ago. It has been no more than five decades since some Western nations introduced the concept of managing defense to address issues such as allocating financial or human resources, solving strategic or operational problems in a comprehensive manner, or using business-like tools to govern the defense sector. Such an enterprise requires excellence at all levels and in every department of the defense establishment. One proven way of achieving this is by applying Management by Objectives, which may contribute to maximizing the operational performance of armed forces. The budget management by objectives is part of the establishment of a new mode of management of the State budget based on the principle of good governance which aims to improve efficiency and ensure transparency in the execution of the state budget. This paper provides an overview of different aspects of budget management by objectives in Tunisia, especially in the Ministry of National Defense, to provide a clear feature and develop an understanding of its major trends and issues. For this purpose, the paper is organized as follows: The first chapter presents a general overview of budget management by objectives, while the second chapter explains the concepts and principles of BMO. The third and final chapter highlights the BMO inside the Tunisian Ministry of Defense.

1. Introduction

The originality of the public finance reform in which Tunisia has been engaged since 2004 is that it was initiated by the executive (ADMINISTRATION) and began with a phase of experimentation and design. It was conducted according to a progressive, participatory, and experimental approach that resulted in the definition and implementation of the different components of this new approach even before the vote of the organic budget law (31 January 2019) which legally dedicates the BMO and confirms the will to move forward in this reform.

The direct consequence of this approach is not only an easy transition from experimentation to the effective application of BMO through the implementation of the Budget Organic Law (1 January 2020), but, above all, all the achievements that will allow the various actors to be more engaged and to progress more securely way in this reform.

The urgency of this reform is underscored by the deteriorating financial situation marked by increasing government spending exceeding the Gross Domestic Product (GDP) and a rising public debt.

This initiative is a part of the budget reforms that Tunisia has begun, notably the 2004 changes to the Basic Law. Collaborative efforts with international organizations, including the World Bank, have contributed to the formulation of the Master Plan of June 3, 2010, outlining the development of targeted budgeting in Tunisia.

So, Budget Management by Objectives represents a novel approach centered on tangible results to achieve predefined goals and objectives corresponding to the services provided. The



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objective is to establish a new form of administration that demands a heightened level of transparency in the country's financial system.

This approach involves defining budgets created through programs that align with public policy and incorporate performance indicators. It enables the measurement of goal achievement and evaluation of the contribution of program managers, who are accountable not only for resource utilization but also for service outcomes.

The creation of a modern and efficient public administrative system was considered a priority for all the Romanian Governments at the time.

Another option for the old structures could only be a democratic society, based on the rule of law and market economy, on decentralization and local autonomy, the state giving up levers and functions specific to centralism.

2. General overview of budget management by objectives

Budget management by objectives (BMO) is a new approach to managing the State budget. It aims to manage financial and human resources efficiently and effectively to achieve specific objectives and provide greater transparency in the budget execution of public policies, enhance the efficiency of public activities and elevate performance through a focus on results in budget management, and move towards a new mode of management with new requirements in the area of governance and greater transparency.

The origin of this approach is the refocusing and reduction of regulations which set obligations of means for the benefit of management tools which define obligations of results.

The BMO fundamentally reforms the budget and management of the State. It establishes optimized management of State finances through the introduction of objectives and performance indicators. By developing a culture of results, the BMO makes it possible to spend better and improve the effectiveness of public action for the benefit of all. It is a process that serves to better manage public funds by rationalizing public choices, but to guarantee good management of public finances, reliable and exhaustive financial and budgetary information must be accessible and promptly on time.

The BMO aims at a new mode of management that requires a degree of transparency of the financial mechanisms of the State, in the sense that it allows the implementation of a budget established by programs translating the public policies with performance indicators allowing to measure the achievement of the assigned objectives and to appreciate the contribution made by those in charge of the programs, the latter are required to account not only for the use of resources but also for the results of their services. This makes it possible to strengthen the effectiveness of public action and increase performance by directing the budget towards results, such are the aims of this reform.

In BMO mode, the budget will be presented by missions, programs, and sub-programs. When the program structure is established, an effort must be made to transcribe the budget into the program nomenclature, by drawing up a transition table.

BMO: How?

- Orienting public management towards a results-based approach by:
- Making managers more accountable for objectives with greater freedom (fungibility).



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- For each program: a strategy, objectives, and performance indicators.
- Measuring the results of performance in order to achieve better use of appropriations.
- Medium-term forecasts.
- Making public policy understandable and comprehensible to everyone by:
- Definition of priorities and allocation of resources: presentation of the budget by public policy program.
- Establishing a link between appropriations and public policy priorities. Moving from a nomenclature by type of expenditure to a nomenclature by purpose or destination of expenditure.
- Improving the transparency of budgetary information and parliamentary control by modernizing of the State's accounts which means moving from cash-based budget accounting for revenue and expenditure to 3-dimensional accounting:
 - Budgetary, General, Cost Analysis.
 - Drawing up the State's financial statements, which will be certified.
 - Accounting in line with international standards.

Budgetary management by objectives implies the construction of a new chain of responsibilities that promotes the mobilization of actors at all levels around the notion of performance. As defined for each program. This chain includes central, decentralized and regional services as well as public establishments.

Under the guidance of the head of the mission, the program manager is the central link in this new chain. He is the national guarantor of the implementation and performance of the program, and he has a managerial responsibility that coexists with his classic hierarchical responsibility. At the operational level, he delegates management to a sub-program manager, either central, regional or inter-regional.

The sub-program manager, after consultation and dialogue with the program manager, commits to operational objectives directly or indirectly related to the strategic objectives of the program. It is responsible for the management of the sub-program and distributes the means at its disposal between the various operational units (OU) which implement the activities defined for the sub-program.

The chain of responsibility goes beyond the public administration perimeter (central and decentralized) to integrate public operators, who in addition to their statutes of public establishments receiving or not receiving subsidies from the State budget, contribute to the achievement of the objectives of the program and their commitment in this context is formalized through performance contracts.

The new approach to budget management by objectives has just made more precise the different levels of responsibility at the level of the perimeter of each public policy. It creates a new chain of responsibility within the framework of the public administration.

Due to the change brought by this reform, management dialogue has become an essential working technique that helps all those in charge to achieve the level of performance committed and subsequently to concretize the effectiveness of public action.

In fact, the management dialogue is an information exchange and decision-making process led and facilitated by the program manager. It can be established vertically with all stakeholders in the realization of its public policy or horizontally with all other external stakeholders either belonging to the perimeter of the mission or from outside.



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The program manager, as part of the operational implementation of his policy, necessarily delegates to the managers of the sub-programs the possibility of also leading management dialogue sessions at their level.

The reform of public finance management through budget management by objectives allows the administrative culture to evolve from a culture based on means to one based on objectives and results, thereby promoting greater accountability among managers.

Budget management by objectives entails several goals, including:

- Making public policies in terms of financial management transparent and understandable to all stakeholders.
- Emphasizing the importance of transparency in budget information and enhancing control mechanisms.
- Shifting the management approach towards one based on objectives and performance indicators.
- Contributing to the fight against corruption.
- Supporting the responsibility and accountability of managers and program administrators.
- Ensuring budgetary discipline by adhering to budgetary sustainability, including the alignment of budget and expenditure programs with macroeconomic objectives.

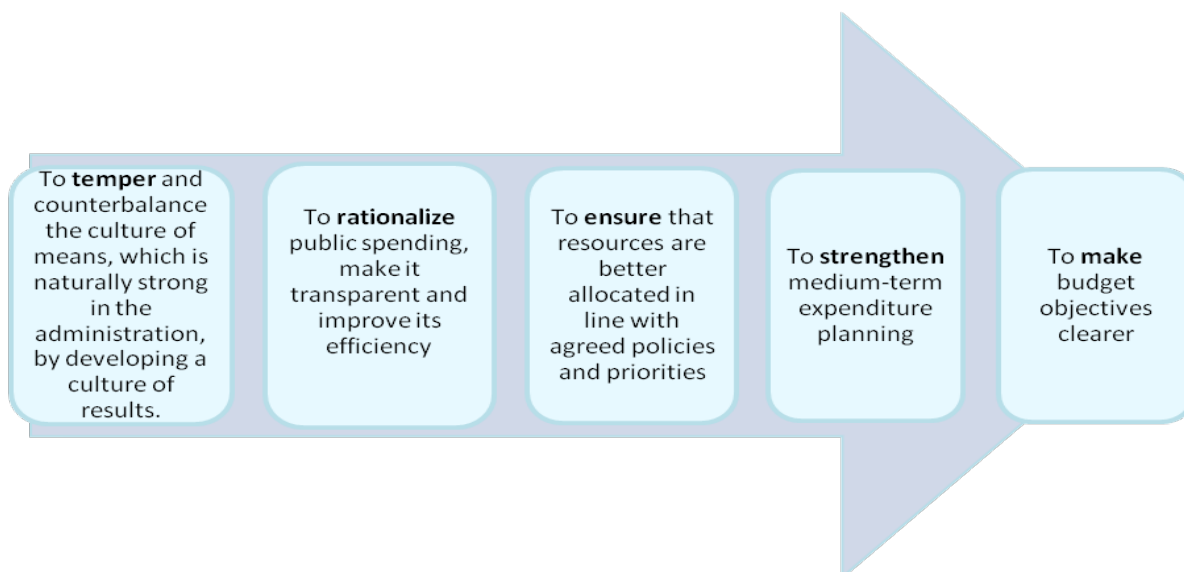


Fig1: Objectives.

Chapter 2: Concepts and principles:

- **The mission:**

It contains a set of programs that contribute to the achievement of specific public policies. It gathers together all the appropriations made available to each head of mission.

- **The program:**

It reflects a specific public policy within the same remit and brings together a homogeneous set of sub-programmes and activities directly contributing to the



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achievement of the public policy objectives of the program. In the sense of the BMO is more specific than the meaning commonly given to this word. Within the framework of BMO, the “program” is a grouping of appropriations intended to implement a coherent set of activities of a department, pursuing the same purpose and placed under the responsibility of a senior manager, “program manager” with which a “performance dialogue” can be initiated. Each program is associated with specific objectives, indicators and performance targets, the actual achievement of which will be assessed. A program can encompass multiple administrative departments and even multiple branches; it can also be a portion of a service only.

- **The sub-program:**

Is a variation of the program in some cases, it may correspond to the functional or operational breakdown of the decentralized departments responsible for implementing the program. It includes all the appropriations intended to cover either a specific measure or a specific category of beneficiaries.

- **The Program Manager:**

He is the person responsible for steering the program, he is designated “Program Manager” by the Head of Mission. The program leader shall ensure that the budget is prepared according to objectives and indicators guaranteeing equity and equality of opportunity between men and women and generally between the different social categories, without discrimination, and will be evaluated on this basis.

- **Management dialogue:**

Means the process of exchanges and decisions established between an administrative level and its subordinate levels, concerning the means made available to subordinate entities, the implementation of actions and the objectives assigned to them, and more generally the concept of performance applicable to the public policies considered. We also talk about “management facilitation”. The Program Lead is the custodian and facilitator of the management dialogue, which is both horizontal and vertical.

The management dialogue makes it possible to reform the administrative structure while inserting interactivity and the participation of all departments in administrative action. In addition, a management dialogue serves to concretize the new modes of management, new techniques aimed at reducing public management. But also a reliable and continuous flow of information to the various levels of administrative services; central and decentralized services are the conditions for the success of the management dialogue.

- **Objectives:**

Each program has a number of objectives set in accordance with public policy objectives.

- **The performance indicator:**

It is a quantitative or qualitative measure depending on the case, which makes it possible to assess the degree of achievement of a given objective.



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It is a numerical representation that measures the achievement of an objective and makes it possible to assess as objectively as possible the achievement of a performance. The time table for an indicator is used to represent the achievements of past years and the targets that the program is targeting for the current year and for the projection years.

- **The Annual Performance Project (APP):**

It includes the programmatic breakdown adopted for each mission, the strategic orientations and all the objectives and indicators adopted for each program. The performance indicators are grouped into annual performance projects associated with each program and annexed to the draft finance law on which managers undertake to report. In this respect, managers can submit proposals to improve and develop performance for each program. The APP is prepared by each department. The presentation of the APP follows a breakdown of the ministry's activity by program, with the objectives and performance indicators corresponding to each program.

- **The Annual Performance Report (APR):**

Highlights the performance achieved compared to the objectives and indicators set out in the annual performance project for the same budget year. The APR is annexed to the Budget Closure Act and presented in the same manner for the presentation of the annual performance project with the aim of comparing the two documents (the report and the annual performance project).

Budget Management by Objectives is based essentially on five major principles which are: Responsibility – Transparency – Stability - Accountability and Performance.

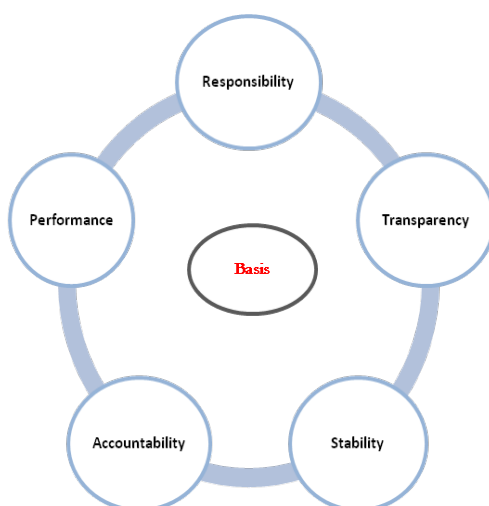


Fig 2: Principles.



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Responsibility: Program managers play a crucial role in executing the budget to achieve defined objectives. They are responsible for steering their program, developing strategy and objectives in line with the mission, preparing the draft budget, and ensuring budget preparation based on objectives and indicators promoting equality.

Transparency: The organic budget law emphasizes a clear and exhaustive budget structure in line with international standards. It necessitates clarifying the roles of all involved in public action, providing relevant information for citizen and parliamentary participation.

Stability: Budgets and public debt are aligned with regularly updated medium-term fiscal frame works, ensuring stability in tax rates and evaluation criteria.

Accountability: Program managers are committed to achieving specific goals, accountable to the mission director. They submit status reports every four months and discuss the program's budget and implementation framework with relevant authorities

Performance: Performance is pivotal in objective budgeting, with finance law outlining expected outcomes and evaluations based on principles of economic efficiency.

Chapter 3: BMO inside the Tunisian Ministry of Defense

Tunisia has adopted an evolutionary approach in installing a new budget management model. Indeed, management by objectives, draws its source from a 1996 decree authorizing the ministers to set up management units by objectives with a view to the realization of well-defined projects. On the basis of this decree several management units by objectives have been created for the execution of well-defined projects.

Then, few years later, the 11th chapter of the 2004 organic budget law introduced for the first time the notion of budget management by objectives. This same article provides that the finance law can authorize the allocation of credits according to programs and missions, where the programs include credits in order to achieve predefined objectives.

It is necessary to specify that at this time, there were some ministers who adopted this management model and especially those called to carry out big projects like ministry of equipment. Finally, it is from 2019 that we can really talk about the reform in terms of budget management by objectives after the Tunisian parliament adopted a new organic budget law on February 13, 2019.

This new organic law has brought many concept that must be followed when preparing the budget. In addition to dividing and clarifying the tasks of each stakeholder, it also devoted the principle of responsibility and accountability in order to further improve transparency and integrity in the management of public funds.

Since then, all administrations have been obliged to follow this approach and a lot of work has been started to install all its components.

The Tunisian armed forces, founded on June 30, 1956, have always been a defensive military power. The military participates in civilian development activities and the fight against natural disasters and in military peacekeeping operations under United Nations control. After the so-called Arab Spring since 2011, new challenges arise which are mainly the fight against terrorism and smuggling. Given the various security challenges that the country has experienced in recent years and to better meet the requirement, the budget allocated to the Ministry of National Defense has more than doubled over the past five years, registering an increase of 106% between 2017 and 2021.



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Thus, the defense budget increased from 1.642 million dinars in 2018 to 3.390 million dinars in 2021, as shown in the following table:

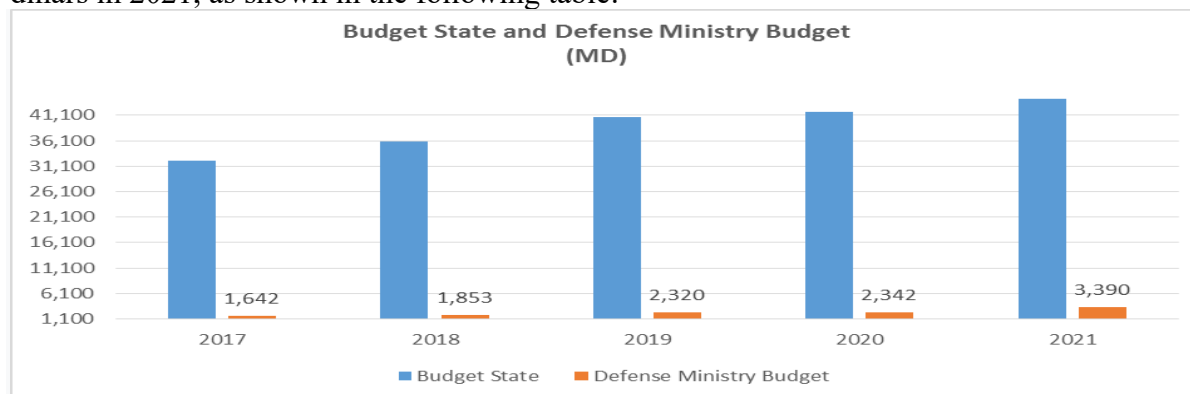


Fig.3: Budget state and defense ministry budget

Budget nomenclature and calendar:

- **Nomenclature:** The budget nomenclature is classified and based on both expenditure destination and economic nature of expenditure:
 - Nomenclature by destination of expenditure: This encompasses expenditures by program, sub-program, operational unit, and activities.
 - Nomenclature by economic nature of expenditure: This adopts a hierarchical structure with parts, paragraphs, and sub-paragraphs. The nomenclature functions as a classification system, adhering to international expense classification standards and integrating into global budget and accounting information systems with diverse classifications.
- **Calendar:** Crucial dates in the budgeting process include:
 - March: Development of the medium-term macroeconomic framework by the Ministry of Development.
 - Before April 20: Publication of sectoral medium-term expenditure framework projects and annual performance reports from ministries.
 - May 15: Review of last year's implementation, update of the current year's budget, and consultations with ministries on sectoral projects of the medium-term expenditure framework.
 - May 25: Council of Ministers approves the medium-term budget framework.
 - May 31: Notification of approval to ministries.
 - September 30: Council of Ministers approves Finance law.
 - October 15: The draft Finance Law is submitted to the People's parliament.
 - December 10: Deadline for the Finance Law to be passed by the People's Deputies.

As all ministries and administrations, the ministry of National Defense mission is composed of four programs and eight subprograms that contribute to fulfilling the mission's strategic goals.

- The minister of national defense leads the MoD mission.
- The general director of the administration and finance affairs leads the pilotage and support program.
- The general director of the military health leads the military assistance program.
- The general director of ammunition and armaments leads the logistical and technical support program.



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- The chief of the cabinet of the MoD leads the military intervention program. The structure of the Tunisian Ministry of Defense's programs typically reflects its strategic priorities, national security objectives, and resource allocations
- The programmatic division of the mission is presented as follows:

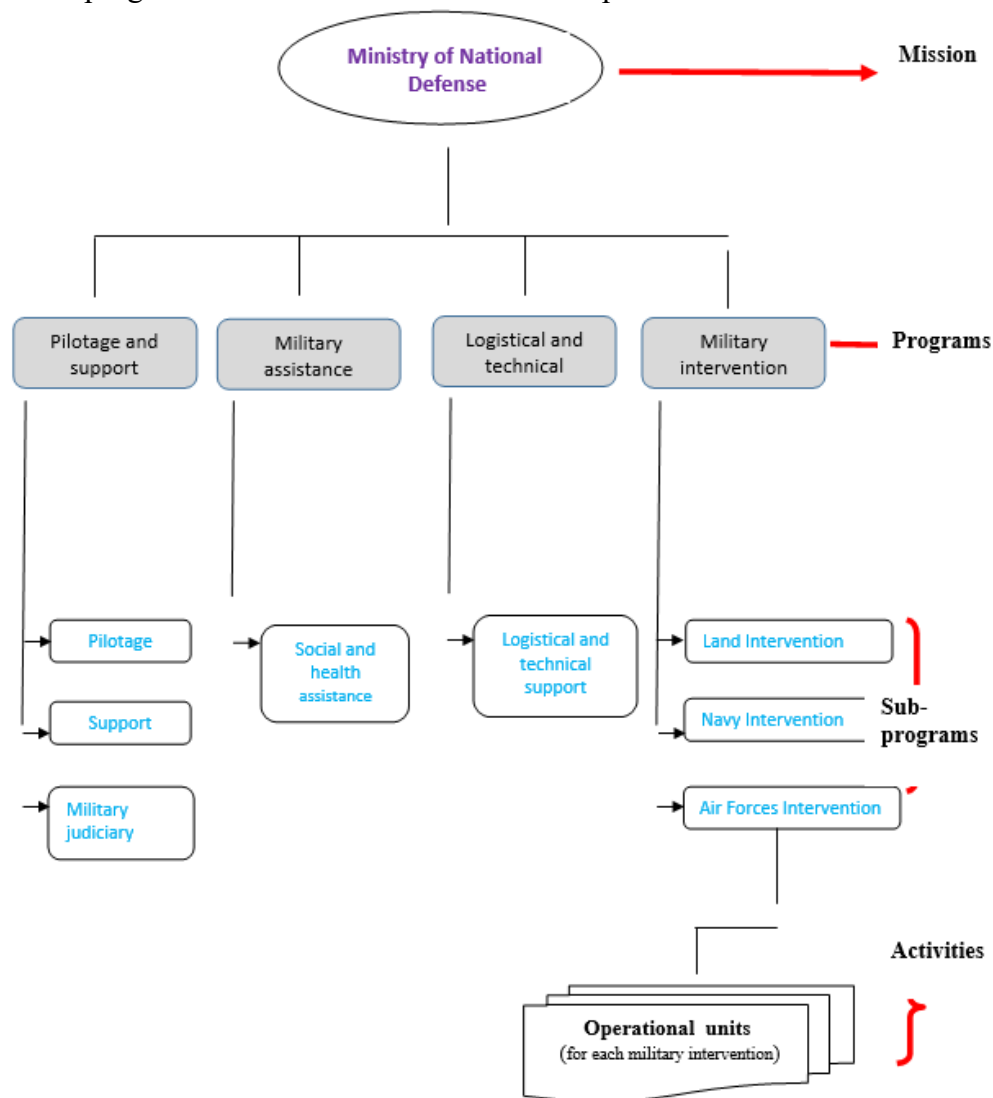


Fig4: Program structure.

- The Missions and programs leaders is presented as follows:



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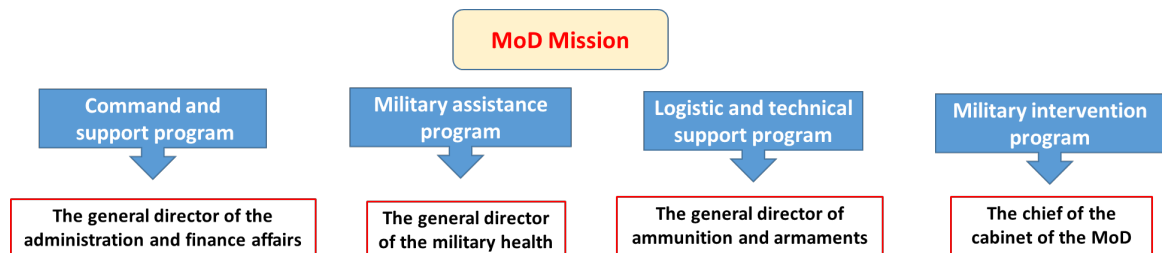


Fig5: Mission and programs leaders.

3.Conclusions:

The adoption of this approach not only facilitates the seamless transition from experimentation to the effective implementation of Budget Management by Objectives (BMO) with the enactment of the Budget Organic Law on January 1, 2020 but also underscores the array of accomplishments that will empower stakeholders to engage more effectively and advance securely within this reform framework.

This reform represents a significant leap towards modernizing the state, bolstering the efficiency of public administration, and fundamentally reshaping it to enhance the efficacy of public endeavors. While this reform represents a pivotal step in establishing a reinvigorated public administration, the journey is far from over.

Several actions need to be taken to complete the process, including expediting training initiatives for all stakeholders, activating the provisions outlined in Article 27 of the Institutional Budget Law concerning the establishment of the national general account, and amplifying the role of oversight bodies like the Court of Accounts.

Budget Management by Objectives not only introduces a novel approach necessitating new techniques but also entails establishing a new organizational structure and regulatory framework conducive to fostering a new cultural paradigm.

It presents an opportunity to invigorate the modernization of the State and fortify the performance of public management, fundamentally transforming public governance to enhance the efficacy of public endeavors and orient Tunisia's public finances towards a managerial culture that serves development and citizen well-being.

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**RESEARCH ON STRATEGIC COMMUNICATION AND
HUMAN SECURITY: ANALYSIS FROM HUMANITARIAN
COMMUNICATION PERSPECTIVE**

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Abstract:

Being listed among the priority issues by the United Nations (UN), human security necessitates a wide and interlinked framework based on reducing vulnerability, sustaining human progress, and building resilience on a global scale. Most recent military operations and protracted crises have become concrete examples that highlight the increasing power of communications while new terms such as strategic communication are directly linked to national security and defense. Since humanitarianism has become a component of global governance and transnational power, humanitarian communication has emerged as an interdisciplinary field based on humanitarianism, media, and communication. Therefore, by broadly focusing on human vulnerability as a part of public concern, humanitarian communication has gained significance with respect to communication strategies designed for humanitarian aid and development. Based on selected international cases, this study aims to portray the relationship between strategic communication and human security from a humanitarian communication perspective.

Key words: humanitarian communication; human security, security studies, strategic communication.

1. Introduction

Humanitarian communication's most visible domain is disasters since the whole crisis process includes images of all types of emergencies and their associated destruction which also becomes highly visible on social media [1]. Therefore, humanitarian communication is defined as a type of communication that focuses on the fact that human vulnerability is a cause for public concern. It compasses humanitarian aid, development, humanitarian rights, and humanitarian war processes [2].

Major disasters often are met with global media coverage which takes the attention of transnational actors while mobilizing immediate response [3]. A vast array of media and communicative coverage by several actors is also examined through the lens of crisis communication that provide critical information during disasters for individuals and communities to survive and facilitate relief activities [4].

Being a relatively new concept, human security was introduced in the Human Development Report in 1994. The term stands for protecting individuals' freedom, preventing chronic threats such as poverty and hunger, and disasters [5]. Therefore, human security necessitates a wide and interlinked framework based on reducing vulnerability, sustaining human progress, and building resilience on a global scale. Accordingly, based on selected international



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cases, this study aims to portray the relationship between strategic communication and human security from a humanitarian communication perspective.

2. The Relationship between Strategic Communication and Human Security

Strategic communication can be broadly defined as communicating purposefully to advance the mission of the organization which implies that people will engage in intentional communication practices on behalf of organizations, causes, and social movements [6]. Communication strategies play an important role in shaping the messages that states convey to the global public and in the process of providing international support. In this process, states use strategic communication while coping with complex crises and shape the balance of power through regional cooperation. Therefore, strategic communication is considered an important process including information management and public opinion manipulation skills at both international and regional levels [7].

In today's world, strategic communication has become an effective tool for states and organizations to achieve their goals at national and international levels. This concept covers planned, long-term, and target-oriented communication strategies to influence a state's domestic and foreign policies and direct public opinion. Effective use of strategic communication is of great importance in many areas, from national security to foreign policy, from trade to cultural diplomacy and crisis management [8].

Strategic communication is originally perceived as an essential component synchronized with national power in the process of supporting national interests. The term was previously used in terms of security-related issues. After the terrorist attacks of September 11, 2001, it has become a highly popular term used in more than a hundred disciplines, subdisciplines, pseudo-disciplines, and professions indicating smart thinking, strategic planning, and coordination [9].

On the other hand, the concept of human security is defined by the United Nations (UN) as security against chronic threats such as hunger, disease, and oppression, as well as protection against sudden and negative disruptions at homes, work environments, or daily life patterns [10]. Since 2017, the UN Security Council has placed the issue of climate change and human security on its priority agenda and started to organize training to raise awareness on this issue and encourage the participation of all its stakeholders.

Upon the establishment of the Commission on Human Security (2001), the human security concept has become a part of international politics providing a human-centered perspective with a focus on protecting individuals. Therefore, a broader understanding of security has emerged and necessitated an essential strategic communication process in which human rights are preserved in addition to traditional issues. Recent nature-related disasters such as the Haiti and Japan earthquakes have shown that these disasters can cause major struggles similar to armed conflicts causing “want” (i.e. lack of water, food, and shelter) and “fear” (i.e. deteriorating social order). By applying strategic communication strategies both in post-disaster and post-conflict situations, multiple actors get engaged in providing bottom-up and holistic humanitarian response.

3. Revisiting the Term Humanitarian Communication

Humanitarian communication can be defined as “*the collection and dissemination of critical, time sensitive, lifesaving information among crisis affected populations and humanitarian agencies, to enable a more effective response to emergencies*” [11]. In recent years, the humanitarian response has become an agent of solidarity, global governance, and transnational power thanks to the centrality of media in human communication [2].



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While humanitarian response is based on impartiality, human rights, and neutrality principles, increasing role of military actors in peacekeeping operations, protracted crises, and disasters has complicated the crisis management process. Therefore, strategic communication may offer new tools for humanitarian communication since it also encompasses crisis communication as well.

4. Conclusion

Albeit being a universal concept, human security is relatively new and still requires special attention for its development as an academic discussion field. In addition to civil-military relations, human security encompasses policy development, developing and implementing resilience measures, as well as strategic communication strategies. Some scholars perceive strategic communication as the management of public relations that is based on social communication. On the contrary, this study examines strategic communication within the framework that focuses on how to deal with threats leading to conflicts and deploying the broad spectrum of necessary resources associated with national power.

Since disasters necessitate the need for a broad perspective for reconsidering human security, a multidisciplinary perspective including both social sciences and the natural sciences would provide essential strategies for disaster risk management while ensuring human security. Herein, by applying a security-based approach, strategic communication would facilitate a more effective crisis management process. Therefore, being directly linked to national security and defense, strategic communication holds the potential to enhance humanitarian communication in the process of ensuring human security in both military and non-military operations.

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**SECURITY AND CLIMATE CHANGE: A RESEARCH FROM
RESILIENCE PERSPECTIVE**

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Abstract:

According to the recent Intergovernmental Panel on Climate Change (IPCC) reports, human security has been exposed to threats such as food insecurity and forced migration as climate change continues at this pace. Therefore, being a threat multiplier, climate change necessitates multilayered precautions to be taken on a global scale. Herein, resilience research offers a useful application-based framework for climate-related hazards. The concept is defined as the development of the ability to act, resist, and adapt comfortably against crises, extraordinary events, and man-made or nature-related disasters. Accordingly, this study aims to examine the relationship between human security and climate change while discussing the potential precautions from a resilience-based perspective.

Key words: climate change; disaster resilience; human security; risk management.

1. Introduction

Being a relatively new concept, human security refers to safety from threats related to “want” (i.e. lack of water, food, and shelter) and “fear” (i.e. deteriorating social order). Climate change and its associated risks have increasingly been impacting human security on a global scale. Storms, floods, sea-level rise, and droughts have forced more than 20 million people to abandon their living places [1]. That’s why climate change is seen as a threat multiplier. It is also expected that climate change will intensify resource scarcity and worsen current environmental, economic, and social factors.

Based on recent developments, this study examines the relationship between human security and climate change from disaster resilience perspective. Therefore, this study aims to discuss the potential precautions for ensuring human security during disasters from a resilience-based perspective.

2. The Relationship between Climate Change and Human Security

The definition of human security differs according to different disciplines. That’s why this study focuses on the definition in the context of climate change in which individuals are protected and yet there are threats to livelihoods, political stability, and culture. There are specific dimensions of human security such as food security, livelihoods, public health and well-being, and regional perspectives [2].

The United Nations (UN) defines human security as security against chronic threats such as hunger, disease, and oppression, as well as protection against sudden and negative disruptions at home, work environments, or daily life patterns [3]. The concept has been placed on the priority agenda by the UN Security Council since 2017. Besides, the Commission on Human Security was established in 2011. They started to organize training to raise awareness on this issue and encourage the participation of all its stakeholders and the human security concept has become a part of international politics providing a human-centered perspective with a focus on



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protecting individuals. Human security has four essential characteristics, and they can be seen in Figure 1 below.



Figure 1. Essential Characteristics of Human Security [4]

Several studies focus on the relationship between climate change and human security; and how climate change affects individuals and communities in terms of how economic, cultural, political, and demographic forces interact with climate change-related impacts [5], [6], [7]. It is found that climate-related disasters pose a risk of poverty and large human losses [8], [9]. It is also suggested that climate-related disasters affect economic stability and human health while posing significant challenges for adaptation. The next session further discusses human security from a resilience perspective.

3. Rethinking Human Security Concept from a Resilience Perspective

Nature-related disasters have forced more than 24 million people to abandon their homes in 2016. The term resilience was initially defined in 1975. The concept mainly refers to available preventive measures for mitigating hazards and disaster risk, improving response concurrently [10]. The significance of resilience has been highlighted since the Hyogo Framework in 2005 upon being further encapsulated as a term in 1999 [11]. Therefore, it is possible to mitigate risks through preventive measures such as resilient urban planning and effective evacuation plans. In order to enhance human security against disasters, the resilience perspective offers adaptation strategies for reducing vulnerability [12].

Recent reports summarize important climate-related risks to human security such as warming trends, extreme temperatures, drying trends, extreme precipitation, damaging cyclones,



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storm surges, sea levels, ocean acidification, and carbon dioxide fertilization [2]. These risks have become priorities for risk reduction and ensuring adaptation as well. On the other hand, the cultural background of the communities is directly linked to the level of impact. For instance, in the Sahel region, farmers are concerned about whether weather-related extremes pose a risk to their livelihoods [13] while Tuvalu people are more concerned about migration rather than climate change [14]. Accordingly, priorities and preventive measures related to human security vary from one culture to another which necessitates different strategies and frameworks for planning.

4. Conclusions

In recent years, the negative effects of climate change have transformed even basic concepts such as security, disaster, and resilience. While the UN's call for immediate preventive measures to be taken on a global scale highlights the urgency of the issue, response strategies of different states underline different approaches based on cultural backgrounds. Therefore, uniting these resilience efforts have become as essential as implementing new ones. This study examines the relationship between human security and climate change and aims to discuss potential precautions from a resilience-based perspective. Being defined as the development of the ability to act, resist, and adapt comfortably against crises, extraordinary events, and man-made or nature-related disasters, the resilience framework offers application-based risk mitigation. Therefore, the dynamic resilience framework, which is given in Figure 2, is suggested for mitigating human security risks. Since this framework focuses on extreme weather, cyber risks, as well as geo-spatial analysis, it is concluded that it can be an application-based model for addressing climate change while mitigating security risks.

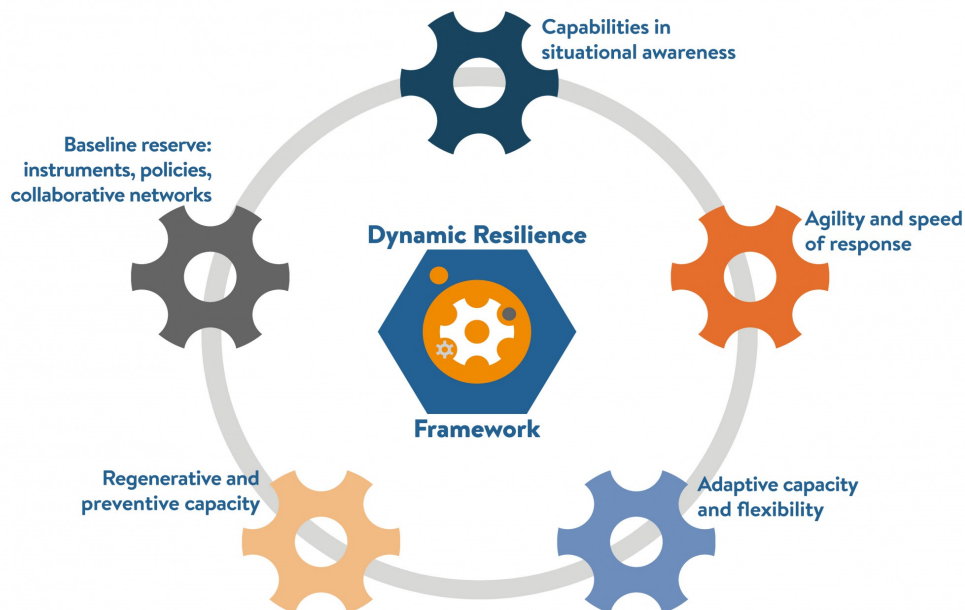


Figure 2. Dynamic Resilience Framework [15]



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CYBER DEFENSE INNOVATIONS IN THE MILITARY DOMAIN

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Abstract:

In an era where cyber warfare has become a critical battlefield, military strategies are rapidly evolving to include cutting-edge innovations in cyber defense. The traditional concepts of national security now extend far beyond land, sea, and air, into cyberspace, where adversaries can exploit digital vulnerabilities to disrupt operations, compromise sensitive data, and even cripple entire infrastructures. The military's role in defending critical infrastructure, communications, and even weapon systems from cyberattacks is paramount to national security. Several key innovations and trends have emerged in recent years.

Key words: cybersecurity; cyberspace; cyber warfare; electronic warfare; security

1.Introduction

In response to this evolving threat, military forces around the world are investing heavily in cyber defense innovations. These innovations are designed to protect critical infrastructure, detect and mitigate cyber threats, and maintain operational superiority in an increasingly digitized environment. Key areas of focus include the development of advanced threat detection systems, artificial intelligence (AI) for cybersecurity, quantum cryptography, offensive cyber capabilities, and enhanced training programs for cyber warfare.

As adversaries continue to develop sophisticated cyber techniques, the military's role in cyberspace is rapidly transforming. Cyber defense has become integral to military strategy, not only for protecting national security but also for ensuring the resilience and effectiveness of military operations across all domains.

As the global military landscape evolves, the domain of warfare has significantly expanded to include cyberspace. Modern military operations now depend heavily on digital infrastructure, from communication networks and surveillance systems to command-and-control operations. This reliance on interconnected technology makes military systems vulnerable to cyberattacks, which can disrupt critical operations, compromise sensitive data, and undermine national security.

To address these vulnerabilities, military organizations are prioritizing cyber defense innovations. These innovations aim to enhance the protection of military networks, infrastructure, and sensitive information against a rapidly growing and increasingly sophisticated range of cyber threats.

In this new era of warfare, cyber defense is now as critical as traditional arms. By leveraging cutting-edge technology, military organizations aim to maintain their operational superiority, protect critical assets, and ensure the resilience of their defense systems against emerging cyber threats.



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2. Airspace Classes Artificial Intelligence (AI) and Machine Learning (ML) for Threat Detection

There AI and ML are revolutionizing the way cyber threats are detected and mitigated. These technologies are being leveraged to develop autonomous systems capable of analyzing vast amounts of data in real time to identify potential threats before they manifest into full-scale attacks. For instance, AI can detect anomalous patterns of behavior in network traffic, signaling an intrusion attempt or a malware infection. This proactive approach drastically reduces response time and enhances situational awareness.

The evolution of Artificial Intelligence (AI) and Machine Learning (ML) has significantly transformed industries worldwide, and one of the most critical sectors to benefit from these advancements is defense and military. The complexities of modern warfare, coupled with the speed and volume of data produced on the battlefield, have led military forces to turn to AI and ML technologies to enhance threat detection capabilities.

In traditional military operations, threat detection relied heavily on human interpretation of intelligence data, sensor inputs, and pattern recognition. However, as technology advanced and adversaries began employing more sophisticated techniques, the limitations of human-centric methods became apparent. AI and ML now offer powerful solutions, improving accuracy, efficiency, and response times for detecting potential threats, thereby providing tactical superiority on the battlefield.

1) Role of AI and ML in Military Threat Detection

Data Analysis and Pattern Recognition, one of the primary applications of AI and ML in military threat detection is in the analysis of large datasets. Modern military operations generate enormous quantities of data from sensors, satellites, surveillance systems, and communication channels. AI algorithms, particularly those based on ML, are capable of processing this data rapidly, identifying patterns that may indicate potential threats. These patterns can include unusual movement in satellite images, irregular communication signals, or abnormal behaviors of vessels and aircraft.

Autonomous Surveillance and Reconnaissance, autonomous drones, equipped with AI and ML, represent a leap forward in military reconnaissance and surveillance. These systems can patrol large areas, analyze live video feeds, and detect suspicious activities in real time without the need for constant human monitoring. AI algorithms, trained on vast amounts of battlefield data, enable drones to recognize potential threats such as hidden weapon caches, enemy movements, or camouflage tactics that would be difficult for human eyes to detect.

Cybersecurity and Information Warfare, in the age of digital warfare, AI and ML have become crucial tools for defending against cyber threats. These technologies can identify and neutralize malicious software, detect abnormal network activity, and predict cyberattacks before they occur. By analyzing vast amounts of network traffic data, AI systems can discern patterns



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that indicate potential breaches or malware infiltrations, enabling military forces to take preventive measures in real-time.

2) Applications of AI and ML in Specific Military Threats

Identifying Hostile Entities, AI and ML models can be trained to analyze facial recognition data, behavior patterns, and biometrics to identify hostile individuals or entities. This is particularly useful in counter-terrorism operations and border security, where the identification of suspects must be done quickly and accurately in environments where false positives can have serious consequences.

Detecting and Neutralizing IEDs, improvised Explosive Devices (IEDs) are a significant threat in modern asymmetric warfare. AI and ML can enhance detection systems by analyzing environmental changes and detecting signatures associated with IEDs. Autonomous robots and drones, equipped with AI-driven threat detection systems, can then neutralize these devices without risking human life.

Challenges in AI and ML Integration, While AI and ML provide significant advantages, their integration into military systems poses challenges. These include ensuring data integrity, reducing bias in AI models, and maintaining trust between human operators and autonomous systems. The complexity of real-world battlefield environments also requires AI systems to be highly adaptable and resilient to changing conditions, which is an ongoing technical challenge.

Ethical Implications of Autonomous Systems, the use of AI in military applications raises ethical concerns, particularly regarding the deployment of autonomous weapons systems. Questions around accountability, decision-making, and the potential for unintended consequences, such as civilian casualties or friendly fire, require careful consideration. Ensuring that human oversight remains an integral part of AI-driven operations is critical to addressing these ethical concerns.

There are many applications for AI, including Chabot's, automated drones, facial recognition, virtual assistants, cognitive automation, fraud detection, autonomous vehicles, and applications for predictive analytics. However, regardless of how AI is applied, each of these applications has something in common. Despite the variety of applications, people who have created hundreds or even thousands of AI projects know that every AI use case falls into one or more of seven categories, as shown in Figure 1.

The seven patterns of artificial intelligence are goal-driven systems, autonomous systems, conversational/human interactions, predictive

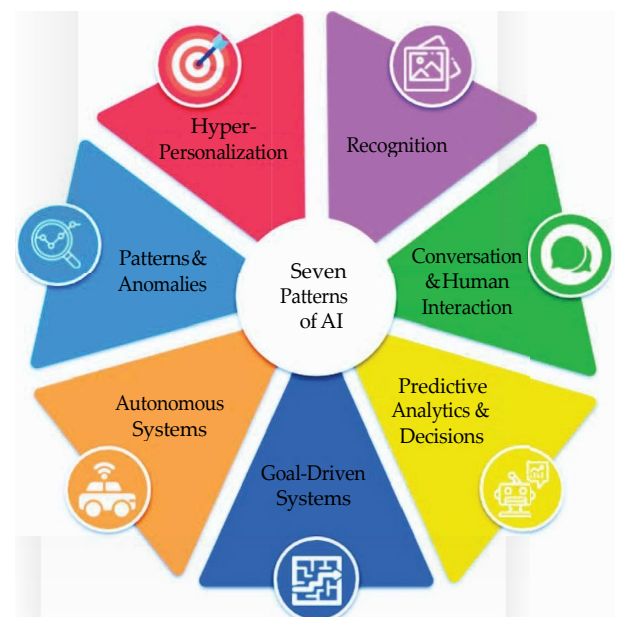


Figure 1: Seven patterns of AI.



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analytics, hyper personalization, and decision support. These seven patterns of AI have revolutionized military operations in recent years, offering new capabilities and applications for tasks such as object detection, decision support, and conversational interactions. The current and future potentials for AI algorithms in the military are examined, with the hope of providing a comprehensive overview of the capabilities, applications, and challenges of using AI in this context.

Any personalized approach to AI will require programming and design because, no matter how these trends and the above innovations are blended, they all follow similar principles. Ten, these seven patterns are employed alone or in various combinations, depending on the specific issue to that AI is being applied.

Example of the artificial intelligence and machine learning for threat detection it is DARPA's Cyber Grand Challenge, it highlights how autonomous systems can detect, patch, and counteract vulnerabilities without human intervention. The challenge showcased the potential of AI and machine learning in enhancing cybersecurity, emphasizing the need for rapid response capabilities in an increasingly complex threat landscape. By demonstrating that machines could perform tasks traditionally requiring human expertise, the Cyber Grand Challenge paved the way for future advancements in automated cybersecurity solutions. This shift promises to improve the speed and efficiency of threat detection and mitigation, ultimately strengthening overall cybersecurity defenses.

3. Cyber Resilience and Deception Technologies

In an increasingly interconnected and digitized world, cyber resilience has emerged as a critical focus area for military organizations. The rising number of sophisticated cyber threats targeting military systems, infrastructure, and data demands the development of robust strategies to defend against these adversaries. While traditional cybersecurity measures such as firewalls and encryption play a vital role, modern military operations are incorporating more advanced techniques, including deception technologies, to enhance cyber resilience and outmaneuver adversaries in the digital battlefield.

Cyber resilience refers to the ability of an organization or system to continue functioning and recover quickly in the face of cyberattacks or disruptions. For military operations, cyber resilience is vital due to the critical nature of missions that depend on secure communications, operational readiness, and data integrity.

Military cyber resilience strategies focus on ensuring that essential services and information remain available and operational even during a cyber intrusion. This includes anticipation of threats, resistance to attacks, absorption of impacts, and recovery from disruptions. Key elements include:

- **Redundancy:** Building redundant systems to prevent single points of failure.
- **Rapid Response Capabilities:** Developing real-time detection and mitigation strategies.



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- **System Hardening:** Ensuring that military networks and critical systems are robust against attacks by limiting attack surfaces.

1) Deception Technologies in Cyber Defense

Deception technologies form a crucial part of a modern military's cyber defense, providing a means to confuse, delay, and deter adversaries. Unlike traditional defenses that simply aim to block threats, deception technologies actively engage attackers, leading them into controlled environments and providing misleading data.

Honeypots are decoy systems set up to resemble real assets such as databases, network servers, or weapon control systems. These honeypots attract attackers by simulating valuable or vulnerable targets. Once engaged, the attackers unknowingly reveal their techniques and motives, allowing military cybersecurity teams to study their behavior and strategies.

Honeynets, a collection of honeypots, simulate entire military networks, creating complex environments where adversaries become increasingly tangled in layers of deception. These systems can also initiate automated responses to attackers, logging their every move and analyzing their actions in real-time.

Deceptive Software and Fake Data, in the cyber domain extends beyond honeypots. Militaries use deceptive software to plant misleading data within systems. This misleads adversaries about the true state or capabilities of military systems, creating false narratives and wasting enemy resources. For example, a deceptive software might simulate vulnerabilities, luring adversaries into exploiting them, while the actual systems remain secure.

Distributed Deception Platforms, deception technologies create dynamic, adaptive networks in which every part of the system can act as a decoy. These platforms deploy fake system artifacts, false network traffic, and simulated user interactions across a military's IT environment, confusing adversaries and making it difficult to distinguish between real and fake assets.

2) The Role of Deception in Cyber Resilience

Deception technologies, when integrated with cyber resilience strategies, provide the military with both offensive and defensive capabilities. Rather than waiting for attacks to happen, military cyber defenders can proactively mislead attackers, gaining intelligence on their tactics, techniques, and procedures (TTPs).

Proactive Threat Engagement: Deception serves as an early warning system, as attackers targeting decoy assets reveal themselves before they reach actual mission-critical systems. By engaging threats in a controlled manner, military cyber defense teams can delay, analyze, and neutralize threats before they cause significant damage.

Operational Continuity Through Deception: The confusion and delay caused by deception allow military systems to maintain operational continuity during cyber incidents. While attackers spend time and resources interacting with decoy systems, critical systems remain functional, giving military forces the time to either neutralize the threat or initiate recovery protocols.



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Real-Time Intelligence Gathering: One of the significant advantages of cyber deception is that it turns an attack into a learning opportunity. By diverting attackers to honeypots and decoy networks, military cyber units can gather valuable intelligence on their methods and intentions. This intelligence can then inform both defensive strategies and offensive cyber operations.

3) Military Applications and Case Studies

NATO's Cyber Defense Strategy: NATO has incorporated deception technologies into its cyber defense strategies to protect its member nations' critical military infrastructure. Honeypots and distributed deception platforms are deployed across NATO's networks, simulating communications and missile defense systems. These systems have successfully diverted cyberattacks from hostile actors, providing valuable insights into their tactics and helping NATO harden its actual defenses.

Cyber Deception in Red and Blue Team Exercises: Military exercises that involve Red Teams (acting as adversaries) and Blue Teams (defending military systems) often incorporate deception to simulate real-world cyber threats. These exercises utilize honeypots, fake credentials, and decoy networks to test how well defenders can detect and respond to adversaries. Red Team operators often spend critical time attacking decoy assets, only to find themselves in a controlled trap, revealing their methods to Blue Team defenders.

Deceptive Malware for Counterintelligence: Militaries sometimes deploy deceptive malware that appears as a vulnerability or exploitable system within critical networks. This malware allows adversaries to believe they have successfully penetrated the system, when in reality they are engaging with controlled traps that record their every move. Such deceptive malware has been used in counterintelligence operations to track adversary activity and mislead them into making critical errors.

Example: The Israeli military uses advanced deception technologies as part of its cyber defense strategy to neutralize adversaries before they can inflict damage. These deception tactics, which include deploying honeypots, decoy networks, and false data streams, are designed to

CYBER RESILIENCE GUIDANCE FOR MILITARY SYSTEMS

1. Design to a cyber adversary like you design to a kinetic one.
2. Design out vulnerabilities as much as possible.
3. Increase the cost for the adversary to get into your system.
4. Increase the cost for the adversary to get around inside your system.
5. Know what is going on in the system at all times.
6. Decrease the impact of the attack.
7. Include recovery and reconstitution of the system in your resilience scheme.
8. Assess and test constantly.
9. Protect the system as you build it.



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mislead attackers, diverting them away from critical infrastructure while gathering valuable intelligence on their methods. This proactive approach allows the military to not only protect key assets but also gain insights into adversarial tactics, techniques, and procedures (TTPs), enhancing their overall cyber resilience.

Blockchain for Secure Data Integrity

Blockchain technology has rapidly evolved from its inception in cryptocurrency systems to a versatile tool used in various sectors, including military applications. At its core, blockchain is a decentralized, distributed ledger technology designed to ensure data integrity through immutability and consensus mechanisms. Unlike traditional databases that rely on centralized control, blockchain's distributed nature makes it resistant to tampering and corruption, ensuring that any data recorded on the blockchain remains transparent, traceable, and secure.

For military organizations that handle vast amounts of sensitive information, the integrity of data is paramount. The use of blockchain ensures that information is both accessible and immutable, providing an unprecedented level of security in an era where cyber threats are constantly evolving.

1. Blockchain in Military Systems

In military environments, the need for secure, tamper-proof communication and data storage is critical. Blockchain technology provides an ideal solution to many challenges faced by modern defense forces. Its decentralized nature eliminates single points of failure, making it harder for adversaries to attack or manipulate the system. Key benefits include:

- **Data Integrity:** Blockchain's immutability ensures that once data is entered, it cannot be altered, providing reliable information for mission-critical decisions.
- **Decentralization:** Information is distributed across multiple nodes, preventing unauthorized access and reducing the risk of insider threats.
- **Enhanced Trust:** Blockchain fosters trust between allied forces and military departments by ensuring all parties access the same verifiable data.

2. Data Integrity and Supply Chain Security

One of the most critical applications of blockchain in the military is supply chain security. Military supply chains are complex, involving the procurement, storage, and transportation of materials ranging from simple equipment to advanced weaponry. Traditional systems are susceptible to tampering, fraud, and inefficiency, which can compromise operations. Blockchain technology offers:

- **Transparent Tracking:** Every transaction along the supply chain can be recorded on the blockchain, allowing for the real-time tracking of goods.
- **Verification of Authenticity:** Blockchain can verify the origin and authenticity of military assets, ensuring that counterfeit or substandard equipment does not enter the supply chain.
- **Auditability:** Blockchain provides an immutable audit trail, making it easier to trace and identify issues if any component is tampered with or goes missing.



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3. Secure Communication and Intelligence Sharing

Blockchain's cryptographic foundations enhance the security of communications within and between military units. The decentralized ledger can be used to encrypt and securely share sensitive intelligence data, reducing the chances of interception or tampering. Blockchain applications in this area include:

- **Encrypted Messaging:** Blockchain can be employed to protect communications channels, ensuring that messages are securely delivered and traceable, with a clear record of who accessed them.
- **Intelligence Sharing Among Allies:** Trusted allies can use blockchain to share intelligence data securely. Each party can verify the data's integrity, reducing risks associated with data manipulation during transmission.

4. Blockchain for Decentralized Command Structures

In high-stakes military operations, command structures are typically centralized, making them vulnerable to disruptions if the central command is compromised. Blockchain can enable decentralized command structures where decisions and orders are securely transmitted to all relevant parties without relying on a single point of failure. Blockchain's role here includes:

- **Resilient Command Systems:** Decentralized blockchain systems ensure that even if part of the network is compromised, operations can continue without interruption.
- **Secure Command Execution:** Blockchain can provide a tamper-proof record of command orders, ensuring that only authenticated and authorized commands are executed.

5. Cybersecurity Enhancements

The threat of cyberattacks on military infrastructure is constantly increasing. Blockchain technology can play a significant role in fortifying the cybersecurity posture of military systems. By its very design, blockchain is resistant to common attacks such as data breaches, man-in-the-middle attacks, and tampering. Some key features:

- **Tamper-proof Data Storage:** Blockchain's immutable ledger ensures that sensitive military data, once written, cannot be altered or deleted without leaving a trace.
- **Access Control and Authentication:** Blockchain can be used for managing identity and access controls, ensuring that only authorized personnel can access certain parts of the system.

Blockchain technology is gaining traction as a means to ensure the integrity and traceability of sensitive military data. Its decentralized nature makes it resilient to tampering, and it can be used to secure supply chains, track logistics, and ensure the authenticity of communications.

Example: The U.S. Department of Defense is exploring blockchain to secure weapons systems and military supply chains from tampering or counterfeit parts. A key example of blockchain in military use comes from the U.S. Department of Defense (DoD), which is actively exploring blockchain technology to secure its weapons systems and military supply chains. By



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leveraging blockchain, the DoD aims to ensure that critical components, such as parts for weapons and equipment, are authentic and have not been tampered with or counterfeited.

Blockchain enables the tracking of each item in the supply chain from its origin to its final destination, creating an immutable record that cannot be altered. This ensures that every transaction, from manufacturing to delivery, is transparent and verifiable. For weapons systems, this means blockchain can protect against the insertion of counterfeit parts that could compromise functionality or pose security risks. The transparency and traceability provided by blockchain enhance both the security and efficiency of supply chain operations, helping to safeguard military assets and ensure mission readiness.

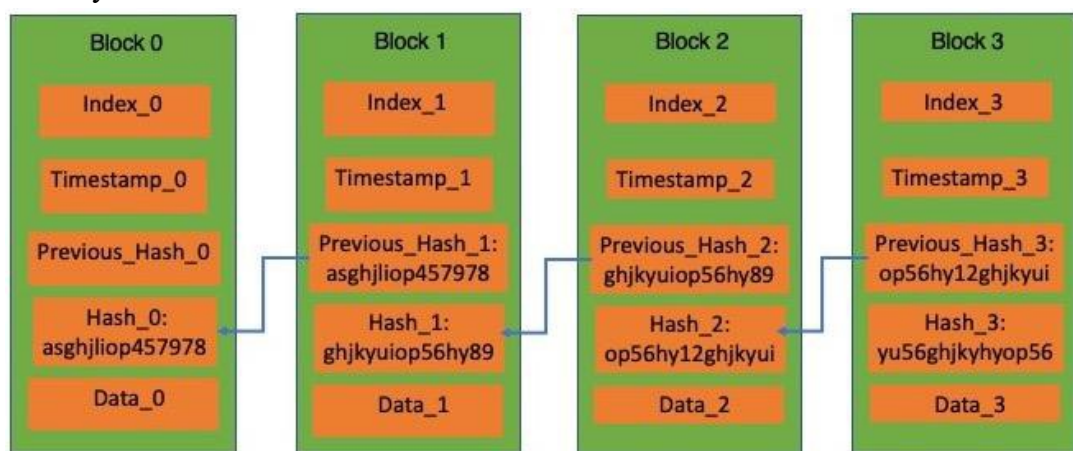


Figure 2. **Blockchain structure**

4. Conclusion

Cyber defense has become an essential element of military strategy, driven by the increasing dependence on digital systems and the growing complexity of cyber threats. The capacity to protect military networks, critical infrastructure, and sensitive data is now integral to maintaining national security. As cyberattacks grow in frequency and sophistication, militaries worldwide are embracing innovative solutions to stay ahead of adversaries.

Emerging technologies have proven transformative in reshaping cyber defense. Artificial Intelligence (AI) and Machine Learning (ML) have enabled real-time threat detection and predictive capabilities, allowing military organizations to anticipate and respond to attacks with greater efficiency. Blockchain technology has introduced new methods for securing communication channels and ensuring the integrity of sensitive data, while the advancements in quantum cryptography have set the stage for future-proofing military networks against the quantum computing era.

Adopting proactive cybersecurity frameworks has fundamentally changed how military organizations approach security. This shift toward identity-based security marks a critical evolution in military cyber defense strategies.



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Collaboration between military organizations and international partners has become increasingly important in the fight against cyber threats. Cyber threat intelligence sharing, multinational defense initiatives, and joint cybersecurity exercises have fostered a global defense network, allowing allied nations to coordinate their responses to cyberattacks and bolster their collective security postures.

Looking ahead, the future of military cyber defense will rely on autonomous defense systems, AI-driven threat responses, and quantum-resistant encryption methods. As cyber warfare becomes a defining element of modern conflict, military organizations must remain agile, technologically advanced, and globally coordinated to defend their digital frontiers.

In conclusion, the innovations in cyber defense are vital for securing military operations in an increasingly digital world. By leveraging emerging technologies, adopting advanced security architectures, and fostering international collaboration, military organizations can build the resilience needed to protect national security in the face of ever-evolving cyber threats.

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**CIVIL PROTECTION - COMPONENT PART OF STATE
SECURITY**

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Abstract:

This article is dedicated to the management (directing) of the civil protection forces - a component of state security. The purpose of the Civil Protection management (CP) is the orientation of the public administration activity, branch offices, local public administration, the heads of economic objects, as well as of other management bodies and civil protection specialists in order to maintain the Civil Protection in a state of readiness for the performance of the entrusted tasks and their practical implementation in cases of exceptional situations. The organizational and the technical basis of the Civil Protection management is constituted by the management system, which includes the command points and the means of transmissions. Communication is the main means of management with the Civil Protection, which is organized in accordance with the decision of the Chair of the Commission for Exceptional Situations (CES), the instructions of the head of the department (section) CP of the district, municipality, and the instructions regarding the communication of the superior management body.

Key words: management (conducting); exceptional situation; natural disaster; civil protection; armed conflict; broadcasting.

1. Introduction

The actuality of the theme consists in the evidence of some important factors regarding ensuring the security of the population from the point of view of management in the conditions of exceptional situations of a non-conflictual, but also conflictual nature, in particular, having a military conflict in the immediate vicinity of our borders, the military conflict in Ukraine directly affects the security of the states in the Black Sea region, as well as neighboring countries. Analyzing the current political-military situation in Ukraine, we come to the conclusion that every state in the world, especially those in the space of the former USSR - must be able to guarantee the security (protection) of its population. Thus Civil Protection is a component part of state security. We refer to the possibilities of the state to react correctly and promptly in the initial phase of the escalation of Exceptional Situations with a conflictual nature (combat actions).

The protection of the population in case of exceptional situations (conflictual and non-conflictual) from the damaging factors of natural and technological catastrophes and the uninterrupted work of the objects, are tasks of great significance for all local public management bodies, executive bodies and leaders of the objects of the national economy. The protection of the population presents a complex of measures, which aim to exclude or minimize the action of harmful factors of crisis situations on the population. In order to fulfill these measures, an effective leadership (management) is necessary with the human, economic, financial and material resources available. The direct management of the civil protection system is the responsibility of the General Inspectorate for Emergency Situations. [2, art. 8]. The fulfillment of the service within the Service by the citizens of the Republic of Moldova is carried out in accordance with the legislation in force [4, art.2]. But we must not forget the obligations of each



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citizen for personal protection and those around him in the event of exceptional situations, for example a fire, which can have very serious consequences. In this sense, every citizen is obliged to know and comply with fire protection regulations at the workplace and at home, to provide the possible help in preventing and extinguishing fires. [3, art. 12].

2. Analysis and statistics of Civil Defense and Emergency Situations

The exceptional situations (fires) that occurred in the Republic of Moldova during the months of January-December of 2023.

According to the statistical data of the General Inspectorate for Emergency Situations in the period from January to December of 2023, **237 ES** were registered, compared to 206 from the same period of 2022.

The total material damage in the period of 2023 following SE is in the amount of **708 million 535 thousand 200 lei**, compared to the same period of 2022, when a material damage was recorded, in the amount of 5 billion 125 million 911 thousand 100 lei (there is a decrease of 86%).

From the total of **237** registered ES:

- **175 man-made ES** (166 ES from the same period of 2022), as a result of which a material damage of 400 thousand lei was recorded (1 million 380 lei in 2022).

- **55 ES of a natural nature** (34 ES in the same period of 2022), as a result of which a material damage of 678 million 944 thousand 400 lei was recorded (5 billion 118 million 872 thousand 300 lei in 2022).

- **7 ES of a biological-social nature** (6 SEs in the same period of the year), when a material damage of 29 million 94 thousand 800 lei was registered (5 million 738 thousand 900 lei in 2022).

As a result of exceptional situations, in the months of january-december of 2023, **8 people** died on the territory of the Republic of Moldova.

Also, during the reporting period, there were 1666 fires (1745 in 2022), resulting in the death of **119 people**, including **2 children**, (120 people, including 2 children, in 2022), the material damage constituting the amount of **106 million 115 thousand 200 lei** (83 million 713 thousand 100 lei in 2022).

As a result of the fires, the following were destroyed:

- objectives – **284**;
- technical units – **96**;
- fodder – **1681 t**.

324 people and material goods in the amount of **360 million 154 thousand lei** were saved from the fires, compared to 252 people saved and 370 million 939 thousand 500 lei in 2022.

3. Conducting (directing) Civil Protection

The unique and efficient organization and coordination of the forces and means intended to carry out the correct actions in exceptional situations (ES) for the purpose of preventing and protecting people, material goods, as well as to remove the consequences of ES, is one of the main tasks of the management.



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The management of Civil Protection is organized and carried out on the basis of Law "On Civil Protection" no. 271 of 09.11.1994, Decisions and decisions of the Government of the Republic of Moldova, the provisions of the General Inspectorate for Emergency Situations, central administration bodies and local public administration, the orders and decisions of the heads of the Objects of the National Economy (ONE), as well as of the educational institutions.

It constitutes the technical-organizational basis for directing the CP management system, which includes:

- governing bodies;
- directing points;
- means of transmission.

In order to ensure the uninterrupted management of the Civil Protection, the organization of the notification of the governing bodies of the CP forces and the population, for the execution of rescue works, the management and notification systems are formed in advance and are kept in permanent working order.

The protection of the population in the event of exceptional situations in peacetime is organized and carried out in accordance with the following principles, namely:

1. The organization and uninterrupted management of the population protection activity by the public management bodies, the heads of the ministries, departments and objects of the national economy;
2. Planning ahead of time and carrying out measures to protect the population throughout the entire territory of the republic;
3. Population protection measures are planned and carried out simultaneously with the measures carried out by the Ministry of Defence, the Ministry of Internal Affairs, the General Inspectorate for Emergency Situations, the Intelligence and Security Service, etc.;
4. Population protection measures are planned and carried out in conjunction with the economic and social development plans of the republic, the municipality, the district and the object of the national economy.

The fundamental conditions for the activity of the Civil Protection in exceptional situations are reflected in the military doctrine of the Republic of Moldova, especially its strict defense character and the principle of reflecting sufficient measures for the defense of the country.

Thus, the **Civil Protection** of the Republic of Moldova represents a system of measures and actions, undertaken on the scale of the entire state in times of peace and war, in order to ensure the protection of the population, property in the conditions of natural and ecological calamities, accidents and catastrophes, epiphytotia, epizootics, fires, as well as in the case of the application of modern means of destruction (hereinafter referred to as exceptional situations). [1, art.1].

Civil Protection training is mandatory.

In the training process in the field of civil protection, the following are trained:

- a) heads of public administration authorities (hereinafter - presidents of commissions for exceptional situations);
- b) employees of public administration authorities, including those empowered to solve problems related to the prevention and liquidation of the consequences of exceptional situations (hereinafter - empowered employees);



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c) persons trained in the sphere of production and service, who are part of the civil protection formations (hereinafter - the personnel of the civil protection formations);

d) persons trained in the sphere of production and service, who are not part of the governing bodies and formations of the civil protection (hereinafter - the population employed in the field of work);

e) persons not trained in the sphere of production and service (hereinafter - the population not employed in the field of work);

f) persons who study in educational institutions, regardless of profile, type of property and organizational-legal form (hereinafter - pupils and students);

g) owners and administrators of reservoirs/ponds. [6, art.1].

In addition to training, the development of civil protection aims to develop and implement in life a substantiated and coordinated policy at the state level regarding the technical-material, economic and financial. Directing the Civil Protection is a very important element in ensuring the protection of the population and their material assets in the event of exceptional situations, including an armed conflict.

Steering must be uninterrupted, firm, stable and flexible.

The purpose and tasks of the CP management consist in keeping the CP in readiness for the fulfillment of measures to prevent and liquidate the consequences of ES.

The goals of CP training – to minimize human casualties, material damage in ES.

Also, the CP preparation requires the presence at the time of ES occurrence of local resources for immediate assistance to the victims with their own means.

One of the principles of CP preparation is the creation of such a structure, which could lead and direct effectively with CP measures in case of occurrence of ES and liquidation of SE consequences.

financial assurance of civil protection. [7, ch. 3, p. 4.].

The management of the Civil Protection represents a very important element in ensuring the protection of the population and their material assets in the event of exceptional situations, including an armed conflict.

Steering must be uninterrupted, firm, stable and flexible.

The purpose and tasks of the CP management consist in keeping the CP in readiness for the fulfillment of measures to prevent and liquidate the consequences of ES.

The goals of CP training – to minimize human casualties, material damage in ES.

Also, the CP preparation requires the presence at the time of ES occurrence of local resources for immediate assistance to the victims with their own means.

One of the principles of CP preparation is the creation of such a structure, which could lead and direct effectively with CP measures in case of occurrence of ES and liquidation of ES consequences.

In accordance with the Law "Regarding civil protection", the management of CP performs the following:

- in municipalities, districts, cities and at ONE - the heads of local public administration bodies and objects;

- in ministries, departments, educational institutions - the leaders of the respective ministries, departments and institutions.

These leaders are the presidents of the CES of the corresponding structures.

The basic tasks of CP routing are:



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- ensuring the permanent training of CP bodies and forces to solve tasks in exceptional situations;
- elaboration and timely correction of CP Plans;
- elaboration of the perspective and annual planning for the improvement of the PC and ensuring its execution;
- organization of the work for securing in time the fund of collective protection constructions and the means of individual protection;
- ensuring the stability of the activity in the objects of the national economy;
- the organization of multilateral training in the CP field of the governing body, CP formations and the population in general for actions in case of exceptional situations.

The governing bodies are:

- CES and the teams of the command points (work groups) of the ministries, departments, general institutions, districts, municipalities, town halls and objects of the national economy
- The CP service and the operative groups of the CP services of the districts, municipalities, town halls and CP sections.

In the conditions of daily activity, PC leadership is organized from the permanent workplaces (offices) of the governing bodies.

For directing in exceptional situations, the following are formed:

- **reserve points**, and if necessary
- **auxiliary driving points**;
- **permanent**;
- **mobile**.

The directing point (**DP**) is the place from where the governing bodies direct civil protection measures. The routing point must ensure uninterrupted routing of the trust link with:

- the higher governing bodies of the CP;
- the subordinate and reciprocal bodies of the CP;
- notifying workers, employees and the population

about the danger and the occurrence of exceptional situations, receiving information about the created situation, receiving decisions and bringing dispositions to the attention of subordinates.

To ensure the stable and uninterrupted management of the DP, the DP team is formed, which is the working body of the CES. The PD teams start their activity with the installation of the strengthened work regime, after the appearance of the ES.

Thus the DP team switches to the 24-hour work schedule.

For the execution of separate tasks, operative groups are created.

The main tasks of the DP team are:

- * the accumulation, analysis and generalization of information about the created situation;
- * informing the executors of the dispositions and controlling their execution,
- * elaboration of work maps, record books of situations.

There are two groups in the DP team of the town hall (ONE):

- 1. generalization and planning group;**
- 2. group of directions.**

The composition of the groups is usually 2-4 people, and if necessary it can be increased. The basis of management is the decision (decision) of **the president of the CES**.



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He is responsible for directing subordinate forces and successfully completing assigned tasks. He must know the defense methods in exceptional situations, the basis of CP organization, be able to quickly make decisions and demand their execution.

A component part of the steering is the transmission system.

Broadcasting is the main means of directing civil protection, which is organized in accordance with the decision of the president of the CES and the provisions of the higher governing body in the field of civil protection.

The transmission is of particular importance, because it determines the preparation of the civil protection management structure.

The loss of the transmission leads to the loss of direction and simultaneously - to the failure to fulfill the assigned tasks.

At enterprises, institutions, objects of the national economy (ONE), the direct responsibility for organizing and ensuring the permanent preparation of transmissions and notices is entrusted to one of the CES members.

The main tasks of the transmission are:

- ensuring the transmission of provisions (orders) and bringing the civil protection system to different levels of preparation;
- informing the population, civil protection management bodies about the emergence of the danger of an exceptional situation;
- ensuring the management of subordinates of civil protection bodies and forces;
- the exchange of information between the mutual management bodies of the civil protection;
- ensuring direction during the execution of rescue works.

To ensure routing, the following types of links are used: wire, radio relay, mobile and signal communication.

The main requirements assigned to the transmission are:

- installation of the transmission on time;
- speed and transmission of correct information;
- the reliable and closed thing under the conditions of using means of destruction and radio-electronic influence.

They ensure the timely planning and deployment of means of communication, the complex use of different means of communication, the knowledge of all leaders how to use different means of communication.

In all conditions, the leader is obliged to have means of communication with subordinates and superiors.

4. Conclusion

Exceptional situations with a non-conflictual but also conflictual character, especially armed conflicts, were, are and, obviously, will be in the future in different parts of the globe. Wars or armed conflicts always have great negative effects due to the loss of human lives, injury or maiming of absolutely innocent people, destruction of material assets and create major dysfunctions in the life and activity of the population. Considering the political-military situation in our region, especially the military activities in the neighboring country - Ukraine, which result in many victims, including civilians



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(from mass media sources), it is necessary to draw special attention to protection (security) the population in the event of exceptional conflict situations.

In order to ensure the protection of the population and their material assets in crisis situations, along with the military forces, the non-militarized formations of the civil protection are also trained, which are forces intended for the liquidation of the consequences of natural calamities, accidents and catastrophes, as well as for the implementation of preventive protection measures civilians in order to reduce the losses from the environment of the population, to reduce the damage caused to the economy by these consequences and in the case of military actions. [8, p.2].

An important role in this respect belongs to the management (management) of the Civil Protection forces. The organizational-technical basis of civil protection management is the management system, which includes management bodies, management points and means of transmission. The emergency management center of the Commission for Exceptional Situations of the Republic of Moldova has tasks in the field of decision support, in the field of coordination, in the field of information management, in the field of communication and notification, as well as in the field of public information.

Thus, the fulfillment of the tasks of the Civil Protection - a component part of the state security, is directly dependent on the quality and stability of the management of the Civil Protection, which, being well prepared, insured and organized, will increase the security of the population in various Exceptional Situations, including those of a conflict nature.

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**CULTURAL CHALLENGES AND OPPORTUNITIES OF
TRANSFERRING STUDENT-CENTERED LEARNING
CONCEPTS, IDEAS AND PRACTICES IN TEACHER-
CENTERED EDUCATIONAL ENVIRONMENTS**

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Abstract:

Student-centered learning (SCL) promises improved learning outcomes and the development of critical 21st-century skills. However, the implementation of SCL in traditionally teacher-centered educational environments presents a unique set of cultural challenges and opportunities. This article explores the complexities of transferring SCL concepts, ideas, and practices into educational systems rooted in teacher-centered paradigms by focusing on the cultural dimensions described by Gert Hofstede. It also highlights the challenges and opportunities offered by the concept of educational transfer. Drawing on unstructured ethnographic observation as a method, we examine the sustainability of educational transfer when faced with cultural barriers that often hinder the adoption of SCL in teacher-centered contexts. The article will conclude with a proposed framework for navigating the cultural challenges and leveraging the opportunities presented by this educational transformation. This framework emphasizes the importance of cultural sensitivity, continuous dialogue, and adaptive implementation strategies. By addressing both the challenges and opportunities inherent in this transition, this article contributes to the ongoing global conversation about effective educational reform and provides practical insights for educators, policymakers, and researchers working towards more student-centered learning environments.

Key words: student-centered learning; teacher-centered education; cultural challenges; educational reform, andragogy.

1.Introduction

Student centered learning is an educational paradigm developed in Western educational contexts. Its transfer into educational environments deeply rooted in teacher-centered approaches and hierarchically constructed social relations raises a number of difficulties, while also presenting opportunities of educational systems' development and intercultural exchange and integration.

The main tenets of student centered learning (SCL) are active participation, peer to peer collaboration, learners' autonomy, committed learning environments and emphasizes the role of students as creators of knowledge, while teachers become facilitators. The main skills SCL develops are critical thinking, problem-solving, individual initiative. When deployed in cultures where respect for authoritative figures, saving face techniques, collective harmony, and compliant learning environments are paramount, the focus on developing such skills raises cultural tensions. Thus, the challenges that arise come not just from the difficulty of institutionalizing and henceforth integrating approaches leading to the development of such skills, but from the balance that needs to be made between educational innovation and cultural preservation (Lohmann, 2022).



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Educational transfer is one concept used to discuss the intricate process of transposing educational policies, practices and innovations from one cultural context to another (Steiner-Khamsi, 2024). It consists of several steps, namely the identification of transferrable elements, contextual factors such as cultural, economic, political, adaptation strategies, and implementation mechanisms (Phillips & Ochs, 2004). Furthermore, it requires involvements of several key stakeholders like policymakers, leadership, practitioners in order to secure the overcome of possible difficulties and assure that adaptations to the features of particular contexts (Yang & Li, 2023). The concept contributes to highlighting not only the role of classroom environment, but also the part played by social expectations, institutional framework and deeply held values in discussing features of learning and knowledge transmission (Kersch, 2019). The telltale signs of possible difficulties in educational transfer are the roles assumed by the teacher and the students in the learning process. The more authoritative the figure of the teacher and the more passive learning required from students, the more difficult becomes the transition towards facilitator's role on behalf of instructors and independent thinking on behalf of students.

However, challenges can become opportunities for educational transformation and cultural exchange. Therefore, understanding the dynamics of culture is crucial for educational leaders, policymakers and practitioners focused on enhancing teaching and learning practices across cultural boundaries.

2. Gert Hofstede's cultural dimensions and their relationship with student centered learning

Hofstede's six cultural dimensions theory allows for a better understanding of how cultural values impact behavior in various groups and societies.

Power distance refers to how people perceive inequality and hierarchical relations. High power distance cultures revere authority figures, are ready to accept inequality generated by hierarchical order and centralized power structures. Hence, communication across levels is formalized and subordinates expect to be told what to do. On the other hand, in low power distance cultures, figures of authority are accessible, people are on equal footing and hold equal rights. As a result of that, power structures are decentralized, subordinates have expectations to be consulted and communication is informal.

Individualism versus Collectivism focuses on how people value individual or group interests. In high individualistic cultures, individual achievement is valued, personal independence matters, and task achievement trumps relationships. Furthermore, personal opinions are expressed and that is related to the adoption of direct communication. However, in high collectivistic cultures, relationships prevail over tasks and hence group harmony is a priority. In such cultures, the family bonds are extended, interdependence among individuals is of utmost importance and that is related to the importance of group consensus over individual opinion. An indirect communication style is also an important feature of such groups.

Masculinity versus Femininity focuses on how gender roles and features are perceived and treated in different cultures. In societies characterized by high masculinity, gender roles are clearly differentiated, work is more important than family, material success is a sign of achievement and the latter comes hand in hand with competition. The people in positions of power are revered and conflicts are solved by force. On the other hand, in high femininity



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cultures, cooperation, work-life balance, well-being are emphasized and negotiation is the way to solve conflicts.

Uncertainty Avoidance refers to the attitude towards ambiguity and uncertainty. In high uncertainty avoidance cultures, risk tolerance is low and therefore formal rules and regulations are perceived as necessary by people. In such cultures, the need for structure and order, for consensus based decision-making makes innovation difficult. By comparison, in Low Uncertainty Avoidance societies, rules are designed and used only on a need basis, while innovation and flexibility are encouraged. Ambiguity does not represent a threat, and tolerance towards various opinions matters.

Long-term versus Short-term Orientation focuses on the difference in societal outlook: past traditions versus future adaptation. High Long-Term Orientation Cultures value persistence towards achieving future gains. Hence, traditions are adapted and problems are approached in a pragmatic manner. Last but not the least, long-term relationships are forged and valued. Nonetheless, High Short-Term Orientation cultures focus on immediate results and expect quick gains. Current needs matter more than future plans and from such a perspective traditions are important. Furthermore, absolute truth is valued.

Last but not the least, the Indulgence versus Restraint differentiation in cultural values analyzes the way gratification of natural human desires is approached in various societies. In High Indulgence cultures, attitudes like freedom of expression, optimism, extraversion, having fun are valued, while in High Restraint cultures strict social norms regulate individual behavior, and pessimism and introversion are prevalent.

A visual overview of the six dimensions discussed above is presented in Fig. 1 below.



Fig.1. Gert Hofstede's cultural dimensions (Source: <https://online.visual-paradigm.com/infoart/templates/strategic-analysis/purple-background-hofstedes-cultural-dimensions-theory-strategic-analysis>)

Even though the high-low approach is simplistic and leaves a lot of intermediate values and associated nuances outside the current discussion, we deem it necessary in terms of its importance for capturing the essence of cultural values. Based on the briefly overviewed cultural differences provided by Hofstede's framework, we will expand the analysis by looking at the impact of those values onto the teachers' and students' propensity towards integrating student centered approaches into their day to day practices. Additionally, we will also enrich the discussion by highlighting how adult learning principles can be enacted or hindered by specific cultural values. We add this element because one major aspect of educational transfer relies, in our opinion, on the success of train the trainers programs aimed enculturating adult teachers into the best practices of SCL.



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2.1 Power Distance dimension and SCL

The teacher-student relationship is very structured in high power distance cultures. Therefore, teachers find it difficult to assume the role of facilitators and allow their students to ask questions outside the thinking box of a given lesson. That is often perceived as a loss of control, authority and even face in front of students. On the other hand, students may be reluctant to assume more active roles. Therefore, some of the SCL approaches that may be difficult to transfer in such cultures are related to self-directed learning. Thus, student-led discussions, self-assessment and peer assessment, negotiated goal setting for one's own learning, feedback to teachers on teaching methods or course content may generate discomfort and reluctance.

COUNTRY	POWER DISTANCE
Africa West	77
Albania	#NULL!
Arab countries	80
Armenia	#NULL!
Azerbaijan	#NULL!
Colombia	67
Georgia	#NULL!
Iraq	#NULL!
Kyrgyz Rep	#NULL!
Morocco	70
Romania	90
Russia	93

Dimension maps: Power Distance

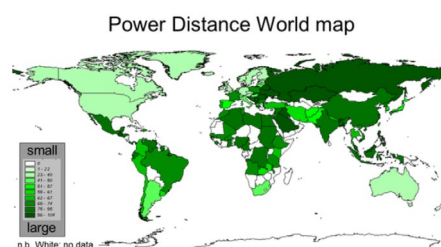


Fig.2. Power distance dimension- a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

Concerning adult learning, one important value is that of self-direction. However, as already made evident by the discussion above, in high power distance cultures, adult learners may find it difficult to apply it given their deeply rooted respect for the teacher as the authoritative figure in the learning process. Furthermore, the more experienced adult learners are, the more likely that they resist peer learning. What is more, it is more often that not for such cultures to accommodate the role of younger instructors as leaders or teachers for older learners.

Last but not the least, cultural expectations as to whose experience counts more in terms of age, status, gender, etc, may limit participation and group work in such cultures.

Related to the adult learning tenet of internal motivation, the concept may vary in terms of interpretation in relation to cultural values. Thus, age-appropriate learning assumptions may impact motivation to learn.

Professional identity and the very status of being an adult may come into conflict with what are perceived as roles and responsibilities of students. Thus, in high power distance cultures, some adults may resist resuming the role of students.

2.2 Individualism vs. Collectivism dimension and SCL

Since collectivistic cultures cherish group harmony and consensus, SCL approaches that push for individual growth and expression may not always be perceived favorably. For example, personal learning contracts or individual development plans may come into conflict with the need to secure group consensus and harmony. The influence of group affiliation over individual



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achievement can also impact the success on transferring best practices in project based-learning, assessment based on portfolios or constituting a personalized learning pace.

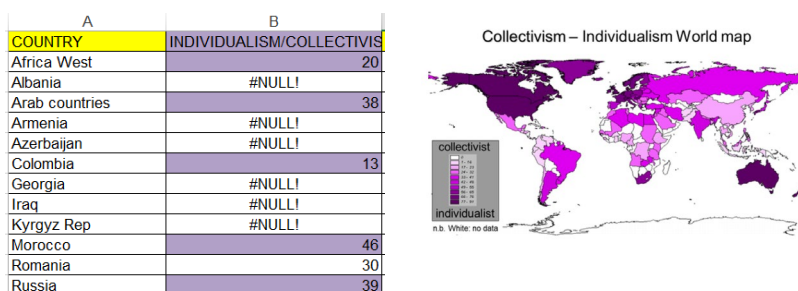


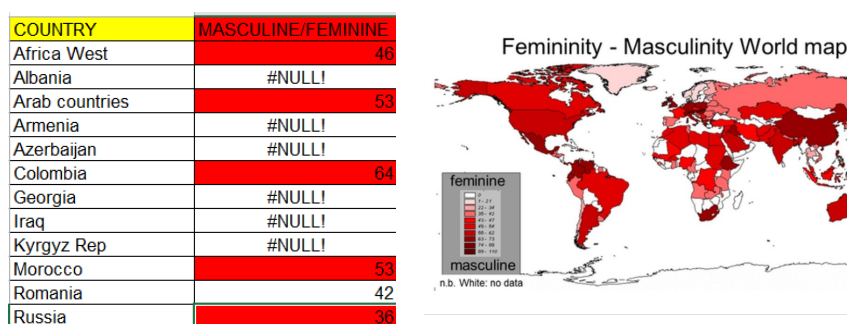
Fig.3. Individualism vs. Collectivism dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

The adults' experience and its role in the learning process is one important principle. However, collectivistic cultures may not leave room for individual expression since that may be associated with boasting and breaking group harmony.

Another principle in adult learning is that adults are internally motivated. However, in collectivistic cultures, group/family expectations may be more important than individual aspirations.

2.3. Masculinity versus femininity dimension

Highly masculine countries prefer competition over collaboration and therefore cooperative learning strategies like speed quizzes, puzzle pieces, jigsaw method may not always generate envisaged results. Furthermore, reflective learning practices such as the reflective learning journal may be perceived as a way of losing face, since self-reflection and emotional awareness come into conflict with given cultural gender roles and structures. Furthermore, peer support systems which require an inclusive based approach and is based on techniques like mentoring, coaching, peer teaching may be seen as bringing less value that individual achievement. Also, the application of process-oriented assessment by teachers such as interviews, observations, checklists, rating scales that focus on effort and progress may come into conflict with achievement oriented values of learners, as well as of the teachers or institutions who are in the position to implement SCL.





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Fig.4. Masculinity versus femininity dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

In masculine cultures status considerations can make collaborative learning challenging, especially when diversity needs to be assured within a learning environment.

2.4. Uncertainty Avoidance dimension

High uncertainty avoidance cultures are very shy of using experiential learning or open ended activities since they are more inclined to favor predictable learning environments. Therefore, when faced with the possibility of facing multiple solutions provided by problem-based learning requirements or by flexible learning environments, students from such cultures demonstrate their preference for “by the book answers” or what is also called “school solution”, as well as fixed schedules and clear rules. Last but not the least, the need for standardized approaches becomes evident when students are asked to design their own assessment tools and employ them with their peers.

COUNTRY	UNCERTAINTY AVOIDANCE
Africa West	54
Albania	#NULL!
Arab countries	68
Armenia	#NULL!
Azerbaijan	#NULL!
Colombia	80
Georgia	#NULL!
Iraq	#NULL!
Kyrgyz Rep	#NULL!
Morocco	68
Romania	90
Russia	95

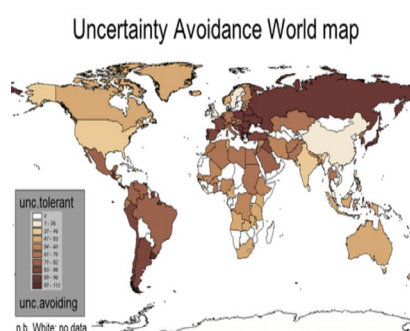


Fig.5. Uncertainty Avoidance dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

The high uncertainty cultures may value theoretical knowledge more than personal experience. Therefore, applying the adult learning experience principle may be challenging.

2.5. Long-Term vs Short-Term Orientation dimension

SCL methods and techniques that focus on gradual skill development, iterative learning processes like in the form of trial and error approaches clash more often than not with the preference of short-term oriented cultures for quick results, immediate learning. Thus, such cultures may feel discomfort with sustained effort, focusing on learning how to learn (i.e. meta-cognitive strategies), revision and improvement.



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COUNTRY	TIME ORIENTATION
Africa West	9
Albania	61
Arab countries	23
Armenia	61
Azerbaijan	61
Colombia	13
Georgia	38
Iraq	25
Kyrgyz Rep	66
Morocco	14
Romania	52
Russia	81

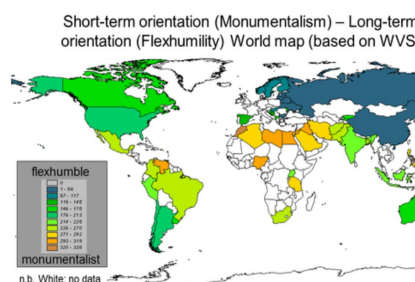


Fig.6. Long-Term vs Short-Term Orientation dimension- a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

One important characteristic of adults is that they aim for the practical application of the learning output. However, in short term oriented cultures what represents “practical” may differ from a Western based approach to that. Also, the practical focus may come into conflict with the value that long-term oriented cultures place on theoretical models.

2.6. Indulgence vs Restraint dimension

In restraint-oriented cultures, SCL concepts like play-based learning, experiential learning, student-designed activities may not necessarily be seen as less valuable compared to formal, structured learning experiences. Therefore, with those cultures’ focus on discipline and abidance by rules, creativity and innovation are not encouraged.

COUNTRY	INDULGENCE
Africa West	78
Albania	15
Arab countries	34
Armenia	#NULL!
Azerbaijan	22
Colombia	83
Georgia	32
Iraq	17
Kyrgyz Rep	39
Morocco	25
Romania	20
Russia	20

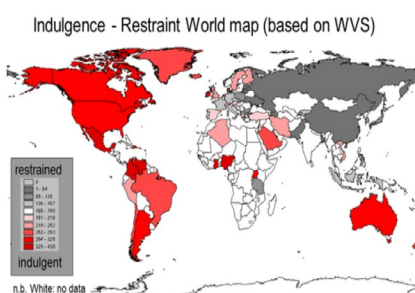


Fig.7. Indulgence vs Restraint dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

3.Opportunities for SCL transfer based on Hofstede’s cultural dimensions



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The opportunities raised by the accurate reading and understanding of cultural values are related both to the practitioner's adequate implementation of SCL approaches, and to long-term institutional integration.

3.1. Practitioners' outlook

In terms of practitioners' approach to employing SCL methods and techniques, several areas require attention especially in adult learning environments, namely: professional identity of learners, age-status interplay, balance between theory and practice, motivation, and learning environment.

Thus, acknowledging and welcoming professional expertise while introducing SCL approaches, creating room for expertise sharing and also showing respect for cultural norms, and not in the least striking a balance between recognition of individual achievement and group harmony are means by which acknowledging and capitalizing on adult learners' professional identity makes it possible to override cultural challenges.

Employing age-appropriate instructional approaches, considering age and status related learning expectations, and addressing power dynamics by demonstrating cultural sensitivity when designing group and team work are important drivers of SCL acceptance.

In order to strike a balance between the amount of theory and practice, it is important to gain knowledge about what kind of knowledge a given group values most. Additionally, understanding cultural timeframes is also important in order to set realistic expectations about learning outcomes.

Individual and group motivation are important drivers of learning. Therefore, accepting and working with different cultural views on what constitutes appropriate adult learning goals is essential. Also, applying the cultural lenses on career progression that is culturally driven provides for more realism in the selection of specific SCL methods.

Last but not the least, the design of culturally appropriate collaborative spaces is also conducive to the gradual acceptance of SCL approaches. In this case, it is a matter of balancing structure and flexibility, for example, when it comes to accommodating various uncertainty avoidance levels, or considering cultural norms shaping professional learning environments.

3.2. Institutionalization and possible internalization measures

One key challenge in SCL adoption is its internalization. Therefore, a scaffolded approach is needed and that can be structured based on some possible steps provided below.

1. Institutional Integration

- creating policies that support SCL while accommodating specific cultural features;
- creating governance structures anchored into local cultural norms and values while also promoting SCL approaches;
- employing or developing institutional quality assurance systems that make use of SCL approaches;
- consolidating existing educational structures via integration on a need-based approach of SCL principles, rather than creating parallel separate initiatives.

2. Capacity Building

- relying on local SCL champions who understand both the methodology and cultural features;



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- cascading training so that experienced practitioners train/mentor newcomers in the form of train-the-trainer programs reflecting cultural norms and values;
- 3. Resource Development
 - developing bilingual resources;
 - establishing resource-sharing networks among similar educational institutions;
 - building resource repositories that consider local technological features and cultural preferences.
- 4. Cultural adaptation
 - using SCL approaches that align with local educational traditions;
 - including culturally relevant examples and case studies;
 - showing respect for local knowledge and learning approaches;
 - accommodating hybrid approaches that accommodate traditional and SCL approaches;
- 5. Stakeholder Engagement
 - involving relevant leaders in SCL focused program design and implementation;
 - designing feedback that is observant of cultural communication norms;
 - maintaining regular dialogue with all stakeholders about SCL adoption;
- 6. Quality Assurance
 - design and develop culturally appropriate evaluation methods;
 - collecting data by observing local hierarchical structures;
 - building continuous improvement processes that align with cultural values;

4. Conclusions

The transfer of student-centered learning practices to teacher-centered educational environments represents a complex endeavor. It requires a careful balance of cultural knowledge, institutional approaches and pedagogical wisdom. An adult learning lens allows for glimpsing the need for several types of changes. First, educators themselves need to begin perceiving their roles and responsibilities in the educational process as facilitators and not just authority figures. That takes role modelling and time for transformation depending on specific cultural variables. Second, structural changes are required, but they can only become meaningful and value adding provided that local cultural features are properly integrated.

Opportunities for educational transfer of SCL in teacher-centered learning environments depend on the wisdom to balance innovation with tradition, individual achievement with group affiliation, institutional requirements with practitioner's autonomy. While challenging to achieve, it represents the key to social growth and development.

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**CULTURAL CHALLENGES AND OPPORTUNITIES OF
TRANSFERRING STUDENT-CENTERED LEARNING
CONCEPTS, IDEAS AND PRACTICES IN TEACHER-
CENTERED EDUCATIONAL ENVIRONMENTS**

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Abstract:

Student-centered learning (SCL) promises improved learning outcomes and the development of critical 21st-century skills. However, the implementation of SCL in traditionally teacher-centered educational environments presents a unique set of cultural challenges and opportunities. This article explores the complexities of transferring SCL concepts, ideas, and practices into educational systems rooted in teacher-centered paradigms by focusing on the cultural dimensions described by Gert Hofstede. It also highlights the challenges and opportunities offered by the concept of educational transfer. Drawing on unstructured ethnographic observation as a method, we examine the sustainability of educational transfer when faced with cultural barriers that often hinder the adoption of SCL in teacher-centered contexts. The article will conclude with a proposed framework for navigating the cultural challenges and leveraging the opportunities presented by this educational transformation. This framework emphasizes the importance of cultural sensitivity, continuous dialogue, and adaptive implementation strategies. By addressing both the challenges and opportunities inherent in this transition, this article contributes to the ongoing global conversation about effective educational reform and provides practical insights for educators, policymakers, and researchers working towards more student-centered learning environments.

Key words: student-centered learning; teacher-centered education; cultural challenges; educational reform, andragogy.

1. Introduction

Student centered learning is an educational paradigm developed in Western educational contexts. Its transfer into educational environments deeply rooted in teacher-centered approaches and hierarchically constructed social relations raises a number of difficulties, while also presenting opportunities of educational systems' development and intercultural exchange and integration.

The main tenets of student centered learning (SCL) are active participation, peer to peer collaboration, learners' autonomy, committed learning environments and emphasizes the role of students as creators of knowledge, while teachers become facilitators. The main skills SCL develops are critical thinking, problem-solving, individual initiative. When deployed in cultures where respect for authoritative figures, saving face techniques, collective harmony, and compliant learning environments are paramount, the focus on developing such skills raises cultural tensions. Thus, the challenges that arise come not just from the difficulty of institutionalizing and henceforth integrating approaches leading to the development of such skills, but from the balance that needs to be made between educational innovation and cultural preservation (Lohmann, 2022).

Educational transfer is one concept used to discuss the intricate process of transposing educational policies, practices and innovations from one cultural context to another (Steiner-Khamsi, 2024). It consists of several steps, namely the identification of transferrable elements,



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contextual factors such as cultural, economic, political, adaptation strategies, and implementation mechanisms (Phillips & Ochs, 2004). Furthermore, it requires involvements of several key stakeholders like policymakers, leadership, practitioners in order to secure the overcome of possible difficulties and assure that adaptations to the features of particular contexts (Yang & Li, 2023). The concept contributes to highlighting not only the role of classroom environment, but also the part played by social expectations, institutional framework and deeply held values in discussing features of learning and knowledge transmission (Kersch, 2019). The telltale signs of possible difficulties in educational transfer are the roles assumed by the teacher and the students in the learning process. The more authoritative the figure of the teacher and the more passive learning required from students, the more difficult becomes the transition towards facilitator's role on behalf of instructors and independent thinking on behalf of students.

However, challenges can become opportunities for educational transformation and cultural exchange. Therefore, understanding the dynamics of culture is crucial for educational leaders, policymakers and practitioners focused on enhancing teaching and learning practices across cultural boundaries.

2. Gert Hofstede's cultural dimensions and their relationship with student centered learning

Hofstede's six cultural dimensions theory allows for a better understanding of how cultural values impact behavior in various groups and societies.

Power distance refers to how people perceive inequality and hierarchical relations. High power distance cultures revere authority figures, are ready to accept inequality generated by hierarchical order and centralized power structures. Hence, communication across levels is formalized and subordinates expect to be told what to do. On the other hand, in low power distance cultures, figures of authority are accessible, people are on equal footing and hold equal rights. As a result of that, power structures are decentralized, subordinates have expectations to be consulted and communication is informal.

Individualism versus Collectivism focuses on how people value individual or group interests. In high individualistic cultures, individual achievement is valued, personal independence matters, and task achievement trumps relationships. Furthermore, personal opinions are expressed and that is related to the adoption of direct communication. However, in high collectivistic cultures, relationships prevail over tasks and hence group harmony is a priority. In such cultures, the family bonds are extended, interdependence among individuals is of utmost importance and that is related to the importance of group consensus over individual opinion. An indirect communication style is also an important feature of such groups.

Masculinity versus Femininity focuses on how gender roles and features are perceived and treated in different cultures. In societies characterized by high masculinity, gender roles are clearly differentiated, work is more important than family, material success is a sign of achievement and the latter comes hand in hand with competition. The people in positions of power are revered and conflicts are solved by force. On the other hand, in high femininity cultures, cooperation, work-life balance, well-being are emphasized and negotiation is the way to solve conflicts.

Uncertainty Avoidance refers to the attitude towards ambiguity and uncertainty. In high uncertainty avoidance cultures, risk tolerance is low and therefore formal rules and regulations are perceived as necessary by people. In such cultures, the need for structure and order, for



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consensus based decision-making makes innovation difficult. By comparison, in Low Uncertainty Avoidance societies, rules are designed and used only on a need basis, while innovation and flexibility are encouraged. Ambiguity does not represent a threat, and tolerance towards various opinions matters.

Long-term versus Short-term Orientation focuses on the difference in societal outlook: past traditions versus future adaptation. High Long-Term Orientation Cultures value persistence towards achieving future gains. Hence, traditions are adapted and problems are approached in a pragmatic manner. Last but not the least, long-term relationships are forged and valued. Nonetheless, High Short-Term Orientation cultures focus on immediate results and expect quick gains. Current needs matter more than future plans and from such a perspective traditions are important. Furthermore, absolute truth is valued.

Last but not the least, the Indulgence versus Restraint differentiation in cultural values analyzes the way gratification of natural human desires is approached in various societies. In High Indulgence cultures, attitudes like freedom of expression, optimism, extraversion, having fun are valued, while in High Restraint cultures strict social norms regulate individual behavior, and pessimism and introversion are prevalent.

A visual overview of the six dimensions discussed above is presented in Fig. 1 below.

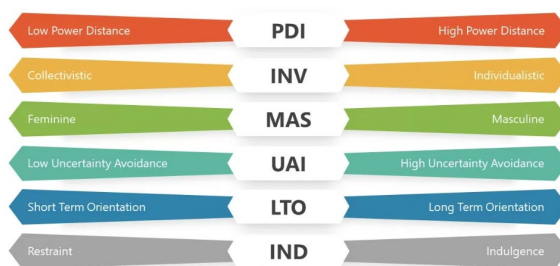


Fig.1. Gert Hofstede's cultural dimensions (Source: <https://online.visual-paradigm.com/infoart/templates/strategic-analysis/purple-background-hofstedes-cultural-dimensions-theory-strategic-analysis>)

Even though the high-low approach is simplistic and leaves a lot of intermediate values and associated nuances outside the current discussion, we deem it necessary in terms of its importance for capturing the essence of cultural values. Based on the briefly overviewed cultural differences provided by Hofstede's framework, we will expand the analysis by looking at the impact of those values onto the teachers' and students' propensity towards integrating student centered approaches into their day to day practices. Additionally, we will also enrich the discussion by highlighting how adult learning principles can be enacted or hindered by specific cultural values. We add this element because one major aspect of educational transfer relies, in our opinion, on the success of train the trainers programs aimed enculturating adult teachers into the best practices of SCL.

2.1 Power Distance dimension and SCL

The teacher-student relationship is very structured in high power distance cultures. Therefore, teachers find it difficult to assume the role of facilitators and allow their students to



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ask questions outside the thinking box of a given lesson. That is often perceived as a loss of control, authority and even face in front of students. On the other hand, students may be reluctant to assume more active roles. Therefore, some of the SCL approaches that may be difficult to transfer in such cultures are related to self-directed learning. Thus, student-led discussions, self-assessment and peer assessment, negotiated goal setting for one's own learning, feedback to teachers on teaching methods or course content may generate discomfort and reluctance.

COUNTRY	POWER DISTANCE
Africa West	77
Albania	#NULL!
Arab countries	80
Armenia	#NULL!
Azerbaijan	#NULL!
Colombia	67
Georgia	#NULL!
Iraq	#NULL!
Kyrgyz Rep	#NULL!
Morocco	70
Romania	90
Russia	93

Dimension maps: Power Distance

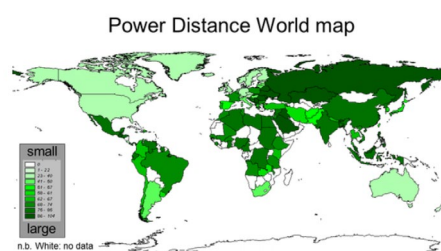


Fig.2. Power distance dimension- a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

Concerning adult learning, one important value is that of self-direction. However, as already made evident by the discussion above, in high power distance cultures, adult learners may find it difficult to apply it given their deeply rooted respect for the teacher as the authoritative figure in the learning process. Furthermore, the more experienced adult learners are, the more likely that they resist peer learning. What is more, it is more often that not for such cultures to accommodate the role of younger instructors as leaders or teachers for older learners.

Last but not the least, cultural expectations as to whose experience counts more in terms of age, status, gender, etc, may limit participation and group work in such cultures.

Related to the adult learning tenet of internal motivation, the concept may vary in terms of interpretation in relation to cultural values. Thus, age-appropriate learning assumptions may impact motivation to learn.

Professional identity and the very status of being an adult may come into conflict with what are perceived as roles and responsibilities of students. Thus, in high power distance cultures, some adults may resist resuming the role of students.

2.2 Individualism vs. Collectivism dimension and SCL

Since collectivistic cultures cherish group harmony and consensus, SCL approaches that push for individual growth and expression may not always be perceived favorably. For example, personal learning contracts or individual development plans may come into conflict with the need to secure group consensus and harmony. The influence of group affiliation over individual achievement can also impact the success on transferring best practices in project based-learning, assessment based on portfolios or constituting a personalized learning pace.



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A	B
COUNTRY	INDIVIDUALISM/COLLECTIVISM
Africa West	20
Albania	#NULL!
Arab countries	38
Armenia	#NULL!
Azerbaijan	#NULL!
Colombia	13
Georgia	#NULL!
Iraq	#NULL!
Kyrgyz Rep	#NULL!
Morocco	46
Romania	30
Russia	39

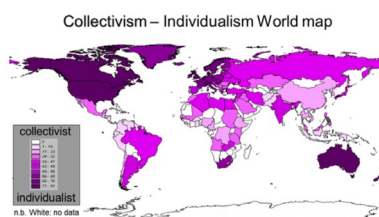


Fig.3. Individualism vs. Collectivism dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

The adults' experience and its role in the learning process is one important principle. However, collectivistic cultures may not leave room for individual expression since that may be associated with boasting and breaking group harmony.

Another principle in adult learning is that adults are internally motivated. However, in collectivistic cultures, group/family expectations may be more important than individual aspirations.

2.3. Masculinity versus femininity dimension

Highly masculine countries prefer competition over collaboration and therefore cooperative learning strategies like speed quizzes, puzzle pieces, jigsaw method may not always generate envisaged results. Furthermore, reflective learning practices such as the reflective learning journal may be perceived as a way of losing face, since self-reflection and emotional awareness come into conflict with given cultural gender roles and structures. Furthermore, peer support systems which require an inclusive based approach and is based on techniques like mentoring, coaching, peer teaching may be seen as bringing less value than individual achievement. Also, the application of process-oriented assessment by teachers such as interviews, observations, checklists, rating scales that focus on effort and progress may come into conflict with achievement oriented values of learners, as well as of the teachers or institutions who are in the position to implement SCL.

COUNTRY	MASCULINE/FEMININE
Africa West	46
Albania	#NULL!
Arab countries	53
Armenia	#NULL!
Azerbaijan	#NULL!
Colombia	64
Georgia	#NULL!
Iraq	#NULL!
Kyrgyz Rep	#NULL!
Morocco	53
Romania	42
Russia	36

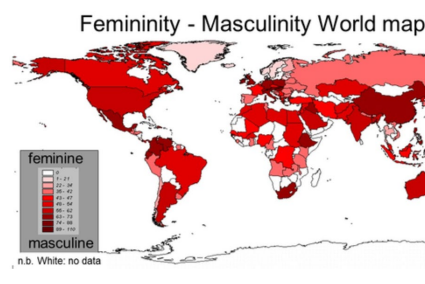


Fig.4. Masculinity versus femininity dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

In masculine cultures status considerations can make collaborative learning challenging, especially when diversity needs to be assured within a learning environment.



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2.4. Uncertainty Avoidance dimension

High uncertainty avoidance cultures are very shy of using experiential learning or open ended activities since they are more inclined to favor predictable learning environments. Therefore, when faced with the possibility of facing multiple solutions provided by problem-based learning requirements or by flexible learning environments, students from such cultures demonstrate their preference for “by the book answers” or what is also called “school solution”, as well as fixed schedules and clear rules. Last but not the least, the need for standardized approaches becomes evident when students are asked to design their own assessment tools and employ them with their peers.

COUNTRY	UNCERTAINTY AVOIDANCE
Africa West	54
Albania	#NULL!
Arab countries	68
Armenia	#NULL!
Azerbaijan	#NULL!
Colombia	80
Georgia	#NULL!
Iraq	#NULL!
Kyrgyz Rep	#NULL!
Morocco	68
Romania	90
Russia	95

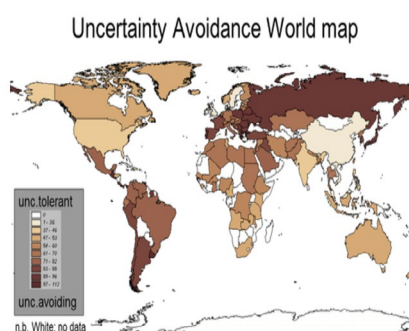


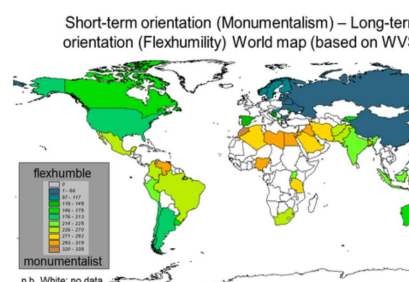
Fig.5. Uncertainty Avoidance dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

The high uncertainty cultures may value theoretical knowledge more than personal experience. Therefore, applying the adult learning experience principle may be challenging.

2.5. Long-Term vs Short-Term Orientation dimension

SCL methods and techniques that focus on gradual skill development, iterative learning processes like in the form of trial and error approaches clash more often than not with the preference of short-term oriented cultures for quick results, immediate learning. Thus, such cultures may feel discomfort with sustained effort, focusing on learning how to learn (i.e. meta-cognitive strategies), revision and improvement.

COUNTRY	TIME ORIENTATION
Africa West	9
Albania	61
Arab countries	23
Armenia	61
Azerbaijan	61
Colombia	13
Georgia	38
Iraq	25
Kyrgyz Rep	66
Morocco	14
Romania	52
Russia	81





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Fig.6. Long-Term vs Short-Term Orientation dimension- a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

One important characteristic of adults is that they aim for the practical application of the learning output. However, in short term oriented cultures what represents “practical” may differ from a Western based approach to that. Also, the practical focus may come into conflict with the value that long-term oriented cultures place on theoretical models.

2.6. Indulgence vs Restraint dimension

In restraint-oriented cultures, SCL concepts like play-based learning, experiential learning, student-designed activities may not necessarily be seen as less valuable compared to formal, structured learning experiences. Therefore, with those cultures’ focus on discipline and abidance by rules, creativity and innovation are not encouraged.

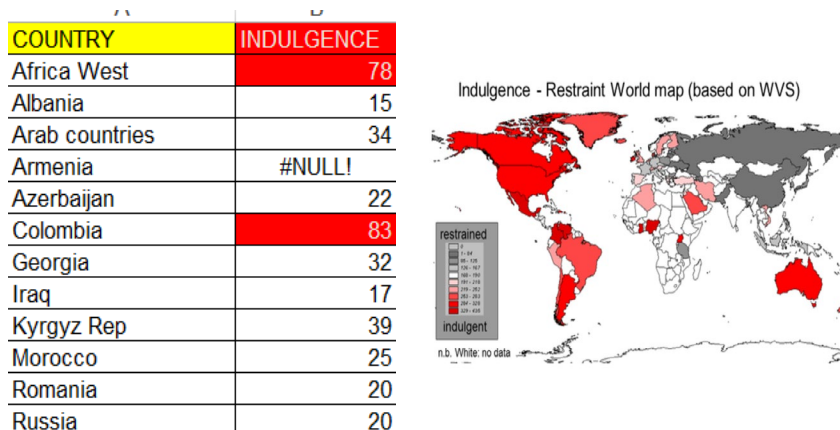


Fig.7. Indulgence vs Restraint dimension - a selected country outlook (Source: <https://geerthofstede.com/culture-geert-hofstede-gert-jan-hofstede/6d-model-of-national-culture>)

3. Opportunities for SCL transfer based on Hofstede’s cultural dimensions

The opportunities raised by the accurate reading and understanding of cultural values are related both to the practitioner’s adequate implementation of SCL approaches, and to long-term institutional integration.

3.1. Practitioners’ outlook

In terms of practitioners’ approach to employing SCL methods and techniques, several areas require attention especially in adult learning environments, namely: professional identity of learners, age-status interplay, balance between theory and practice, motivation, and learning environment.

Thus, acknowledging and welcoming professional expertise while introducing SCL approaches, creating room for expertise sharing and also showing respect for cultural norms, and not in the least striking a balance between recognition of individual achievement and group



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harmony are means by which acknowledging and capitalizing on adult learners' professional identity makes it possible to override cultural challenges.

Employing age-appropriate instructional approaches, considering age and status related learning expectations, and addressing power dynamics by demonstrating cultural sensitivity when designing group and team work are important drivers of SCL acceptance.

In order to strike a balance between the amount of theory and practice, it is important to gain knowledge about what kind of knowledge a given group values most. Additionally, understanding cultural timeframes is also important in order to set realistic expectations about learning outcomes.

Individual and group motivation are important drivers of learning. Therefore, accepting and working with different cultural views on what constitutes appropriate adult learning goals is essential. Also, applying the cultural lenses on career progression that is culturally driven provides for more realism in the selection of specific SCL methods.

Last but not the least, the design of culturally appropriate collaborative spaces is also conducive to the gradual acceptance of SCL approaches. In this case, it is a matter of balancing structure and flexibility, for example, when it comes to accommodating various uncertainty avoidance levels, or considering cultural norms shaping professional learning environments.

3.2. Institutionalization and possible internalization measures

One key challenge in SCL adoption is its internalization. Therefore, a scaffolded approach is needed and that can be structured based on some possible steps provided below.

1. Institutional Integration

- creating policies that support SCL while accommodating specific cultural features;
- creating governance structures anchored into local cultural norms and values while also promoting SCL approaches;
- employing or developing institutional quality assurance systems that make use of SCL approaches;
- consolidating existing educational structures via integration on a need-based approach of SCL principles, rather than creating parallel separate initiatives.

2. Capacity Building

- relying on local SCL champions who understand both the methodology and cultural features;
- cascading training so that experienced practitioners train/mentor newcomers in the form of train-the-trainer programs reflecting cultural norms and values;

3. Resource Development

- developing bilingual resources;
- establishing resource-sharing networks among similar educational institutions;
- building resource repositories that consider local technological features and cultural preferences.

4. Cultural adaptation

- using SCL approaches that align with local educational traditions;
- including culturally relevant examples and case studies;
- showing respect for local knowledge and learning approaches;
- accommodating hybrid approaches that accommodate traditional and SCL approaches;

5. Stakeholder Engagement



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- involving relevant leaders in SCL focused program design and implementation;
 - designing feedback that is observant of cultural communication norms;
 - maintaining regular dialogue with all stakeholders about SCL adoption;
6. Quality Assurance
- design and develop culturally appropriate evaluation methods;
 - collecting data by observing local hierarchical structures;
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4. Conclusions

The transfer of student-centered learning practices to teacher-centered educational environments represents a complex endeavor. It requires a careful balance of cultural knowledge, institutional approaches and pedagogical wisdom. An adult learning lens allows for glimpsing the need for several types of changes. First, educators themselves need to begin perceiving their roles and responsibilities in the educational process as facilitators and not just authority figures. That takes role modelling and time for transformation depending on specific cultural variables. Second, structural changes are required, but they can only become meaningful and value adding provided that local cultural features are properly integrated.

Opportunities for educational transfer of SCL in teacher-centered learning environments depend on the wisdom to balance innovation with tradition, individual achievement with group affiliation, institutional requirements with practitioner's autonomy. While challenging to achieve, it represents the key to social growth and development.

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**HUMAN SECURITY AND RESILIENCE, FROM A DEFENCE
PERSPECTIVE**

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Abstract:

Human security has emerged as a pivotal concept in contemporary defense strategies, emphasizing the protection and empowerment of individuals and communities within the broader context of national and global security. This paper, entitled Human Security and Resilience: A Defense Perspective, explores the integration of human security principles into military operations and strategic planning. It argues that a comprehensive understanding of human security not only enhances the effectiveness of military missions but also addresses the root causes of conflict and instability. The paper outlines three strategic objectives for incorporating human security into defense frameworks: first, to embed human security considerations in military planning; second, to foster collaboration with governmental and non-governmental partners; and third, to analyze the underlying factors contributing to insecurity. By adopting a human-centric approach, defense organizations can better anticipate and respond to crises, thereby reinforcing their legitimacy and operational effectiveness. Furthermore, the discussion highlights the interconnectedness of resilience and human security, particularly in urban conflict scenarios where civilian safety is paramount. The integration of resilience strategies into military operations is presented as essential for mitigating civilian harm and enhancing operational outcomes. Ultimately, this paper advocates for a shift from traditional state-centric security paradigms towards a more inclusive framework that prioritizes the well-being of individuals as a cornerstone of national defense policy.

Key words: human security; challenges; defense; strategies; resilience

1. Introduction

The idea of human security has transformed the way we understand and approach security in the 21st century. Unlike conventional security models that focus on the sovereignty and territorial integrity of nations, human security prioritizes the protection and empowerment of individuals and communities. First introduced in the United Nations Development Programme (UNDP) Human Development Report in 1994, human security is defined as “freedom from fear and freedom from want.” This definition encompasses various aspects, including economic, food, health, environmental, personal, community, and political security. This broader perspective acknowledges that threats to security can stem from poverty, disease, and environmental degradation, just as much as from armed conflict or terrorism.



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As defense organizations respond to increasingly complex global challenges, integrating human security principles has become essential. This paper argues that incorporating human security considerations into defense frameworks not only improves the effectiveness of military operations but also tackles the root causes of conflict and instability. A strong human security approach enables the anticipation and mitigation of crises, enhances civil-military relations, and ensures that military missions align with wider global security and development objectives.

To delve into these dynamics, this paper outlines three key goals for integrating human security into defense strategies: incorporating human security into military planning, promoting collaboration across sectors, and addressing the fundamental factors that contribute to insecurity. Additionally, it emphasizes the vital role of resilience in urban conflict situations, where protecting civilians and critical infrastructure is crucial. By advocating for a shift towards inclusive security frameworks, this paper supports a comprehensive approach that places human well-being at the heart of national defense policy.

2. Embedding Human Security in Military Planning

Military planning has traditionally been driven by state-centric objectives, focused on the defense of territorial boundaries and national interests. The increasing complexity of contemporary conflicts generates the need for a broader, more comprehensive approach that incorporates human security considerations, in order to improve operational effectiveness, reduce civilian harm, and address the root causes of instability.

The integration of human security into military planning requires first of all redefining the operational priorities and military objectives. Traditional military campaigns often emphasize territorial control and the neutralization of enemy forces. Of course, these objectives remain central to warfare, but they should also be complemented by efforts to protect civilians, safeguard critical infrastructure, and promote long-term stability. An example of the challenges and opportunities of integrating human security into military planning is provided by the lessons identified during the NATO's engagement in Afghanistan, highlighting the difficulties of balancing kinetic operations with civilian protection, particularly in areas of active conflict (Fishstein & Wilder, 2012).

Operationalizing human security also requires military planners to consider the multidimensional nature of security threats, through identifying vulnerabilities, assessing civilian needs, and integrating these factors into mission objectives. The key elements of Human-Centric Planning are risk assessments focused on civilians (enabling forces to anticipate and mitigate harm) and prioritizing critical infrastructure (as in urban conflict scenarios, targeting power grids, water supplies, or hospitals can have devastating consequences for civilians).

To ensure that human security principles are effectively embedded in military operations, defense organizations must invest in specialized training and capacity-building programs, which should equip personnel with the skills and knowledge needed to address the social, economic, and cultural dimensions of security.

The integration of human security into military planning offers several advantages:

1. **Enhanced Operational Effectiveness:** By addressing the root causes of instability, such as poverty and poor governance, military operations can achieve more sustainable outcomes.



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2. Strengthened Civil-Military Relations: Focusing on civilian welfare builds trust between military forces and local populations, reducing hostility and enhancing cooperation.

3. Alignment with Global Security Goals: Human security principles align with international frameworks, such as the United Nations Sustainable Development Goals (SDGs), positioning defense organizations as partners in global development.

The interconnected and multidimensional nature of contemporary security challenges necessitates collaboration between defense organizations and a wide array of stakeholders, including governmental agencies, non-governmental organizations (NGOs), international institutions, and local communities. The advantage of this multi-sector collaboration derive from the fact that military efforts to address human security are thus rendered comprehensive and sustainable, leveraging the expertise and resources of diverse partners, as military forces alone cannot address the complex root causes of insecurity, such as poverty, inequality, and weak governance. Collaboration fosters resource efficiency (by pooling resources from multiple sectors ensures that limited budgets are allocated effectively, avoiding duplication of efforts) and contextual understanding by using the expertise of the local NGOs and community organizations who often have deeper knowledge of the cultural and social dynamics within conflict zones, which can inform more nuanced military strategies. This collaboration also ensures an enhanced legitimacy, as partnerships with respected civilian organizations can enhance the perceived legitimacy of military operations, reducing opposition and fostering trust.

While collaboration offers significant benefits, it also presents challenges, deriving from the complexity of ensuring coordination of different organizational priorities and procedures, from power imbalances as military forces often dominate partnerships due to their resources and authority, which can marginalize civilian perspectives and from security risks, as NGOs and civilian partners may face increased risks when operating alongside military forces, being perceived as aligned with one side of a conflict. Addressing these challenges requires the establishment of clear communication protocols and shared objectives can reduce coordination difficulties, setting up training programs that emphasize equal partnerships and respect for civilian expertise can mitigate power imbalances and developing security frameworks that prioritize the safety of all partners and ensure that collaboration remains viable.

In order to enhance this cooperation, defense organizations should formalize partnerships through agreements that outline roles, responsibilities, and shared goals, through Civil-Military Cooperation (CIMIC) doctrines that provide a structured approach to engaging civilian partners in conflict zones. Also, cross-sector training initiatives can build mutual understanding and foster trust among military and civilian personnel (for example, simulation exercises that involve military forces, NGOs, and local leaders can prepare participants for real-world challenges). Also, tools like geographic information systems (GIS) and digital communication platforms can facilitate information sharing and enhance coordination among stakeholders.

3. Resilience and Human Security in Urban Conflict Scenarios

Urban conflict has emerged as a defining feature of contemporary warfare, with devastating impacts on civilian populations and critical infrastructure. The interconnectedness of resilience and human security is particularly evident in urban settings, where the destruction of basic services such as water, electricity, and healthcare can exacerbate vulnerabilities and prolong recovery and integrating resilience strategies into military operations is essential for



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mitigating civilian harm, preserving infrastructure, and ensuring the long-term stability of affected communities.

In the context of urban conflict scenarios, resilience strategies should focus on preserving essential services, such as protecting critical infrastructure (hospitals, water supplies, and power grids), vital for civilian survival and post-conflict recovery, supporting civilian adaptation through community-led initiatives, such as neighborhood watch programs and local governance committees in order to empower civilians to take an active role in their security. Also, post-conflict recovery efforts should prioritize rebuilding infrastructure and restoring services to ensure long-term stability.

Defense organizations can play a pivotal role in enhancing urban resilience by aligning their operations with human security objectives. This can be achieved by the use of precision-guided munitions and adherence to international humanitarian law to reduce collateral damage and civilian casualties, supporting humanitarian efforts by securing supply routes and providing logistical assistance and incorporating reconstruction planning into military strategies to ensure that recovery begins as soon as hostilities cease.

While the integration of resilience into urban conflict strategies offers significant benefits, it also presents significant challenges, such as balancing military and civilian objectives, as prioritizing resilience may conflict with traditional military goals, such as the rapid neutralization of enemy forces. Challenges also derive from limited funding and logistical challenges that can hinder the implementation of resilience initiatives. The close collaboration between military forces, local authorities, and humanitarian organizations required for effective resilience building can be difficult to achieve in reality, especially in high-intensity conflicts.

The traditional state-centric model of security, which prioritizes the sovereignty and territorial integrity of nations, is increasingly insufficient in addressing the complexities of contemporary global challenges, considering that an inclusive security framework, which prioritizes the well-being and empowerment of individuals and communities, is essential for fostering sustainable peace and stability. State-centric security models often fail to address the root causes of insecurity, such as poverty, inequality, and environmental degradation and a narrow focus on military threats, these models risk perpetuating cycles of conflict and neglecting the needs of vulnerable populations.

An inclusive security framework should place the protection and empowerment of individuals as a cornerstone of national defense policy, based on a human centric policy design, as defense strategies should be informed by a deep understanding of the needs and vulnerabilities of civilian populations. Marginalized and vulnerable groups, such as women, children, and ethnic minorities should be considered central to security planning and implementation, in conjunction with prioritizing strategies that address the structural causes of insecurity, such as weak governance and economic disparity. International norms and frameworks can provide critical guidance for advancing inclusive security approaches. The Responsibility to Protect (R2P) doctrine, adopted by the United Nations in 2005, underscores the international community's commitment to protecting populations from genocide, war crimes, ethnic cleansing, and crimes against humanity.

In these contexts, defense organizations and policymakers should strive to integrate human security into national defense strategies and military doctrine, strengthen partnerships with multilateral institutions, such as the United Nations, and regional organizations to coordinate inclusive security efforts and engage local communities in security planning and



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implementation to ensure that strategies are contextually appropriate and sustainable. By prioritizing the well-being of individuals and addressing the underlying causes of insecurity, this framework not only enhances the legitimacy and effectiveness of military operations but also contributes to sustainable peace and global stability.

4. Conclusion

The integration of human security principles into defense strategies represents a fundamental shift in the way security is understood and pursued. By prioritizing the protection and empowerment of individuals, defense organizations can address the root causes of instability, enhance operational effectiveness, and build trust with civilian populations. This paper has outlined three strategic objectives for incorporating human security into military frameworks: embedding human security in military planning, fostering multi-sector collaboration, and addressing the underlying factors contributing to insecurity. Additionally, the discussion emphasized the critical role of resilience, particularly in urban conflict scenarios where civilian safety and infrastructure preservation are paramount.

While significant progress has been made, challenges remain in operationalizing human security within traditional military structures. Overcoming these barriers requires a concerted effort to institutionalize human-centric principles, foster international collaboration, and develop innovative resilience strategies. Ultimately, the shift from state-centric to human-centric security paradigms is not merely a theoretical exercise but a practical necessity in an increasingly interconnected and complex world. By embedding human security into the core of defense policy and practice, nations can create a more just and stable global order, where the well-being of individuals serves as the foundation for national and international security.

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**EVOLUTION OF THE DEFENSE BUDGET ALLOCATIONS IN
THE PAST 20 YEARS. A COMPARISON BETWEEN NATO
COUNTRIES AND THE RUSSIAN FEDERATION**

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Abstract:

Ever since the NATO Summit in Wales in 2014, specialized literature has focused on the desire of several member states to increase their defense budget to 2% or more. This has been a debated topic and while several countries inside the European Continent like Germany, Belgium or the Netherlands have failed to increase their portion of the GDP allocated to defense, other countries in the Eastern flank have managed to reach the target, including Romania, Poland and the Baltic States. Future increase of the budget is nowadays into discussion in order to meet the ever-increasing risk and threats that have emerged on the European Continent ever since the full-scale invasion of Ukraine by the Russian Federation. While experts debate whether this approach is a correct one, few have analyzed the increase in the defense budget of the Russian Federation over the years. While NATO countries find it difficult to reboot their defense industry, for the Russian Federation this is a much easier process. Put into the context of diminished defense budget, this could be an explanation of the current gap in this regard. Analyzing in comparison, therefore, the way in which the defense budget has evolved in number in NATO and in the Russian Federation could provide a better view on what strategy NATO countries should follow in regard to their defense spending in order to meet the current needs and goals both from a strategic point of view but also from a practical one, that best suits the redevelopment of essential defense assets including the European defense industry.

Key words: defense budget, GDP, defense allocation, defense expenditures, defense procurement, defense industry

Introduction

Over the past decade, ever since the Crimean invasion from the Russian Federation took place in 2014, there has been an increase in defense expenditures worldwide. For NATO Countries this has meant a commitment following the NATO Summit in Wales to increase the defense budget to at least 2% of National GDP. While that has meant an immediate response from some countries, especially those on the Eastern Flank, for other member states increasing the budget to such a degree just wasn't a priority.

The Russian Federation Invasion in Ukraine on the 24 of February, 2022 however, changed the paradigm and most NATO states jumped to an increased budget, most of them around the 2% margin. The increased allocation of the GSP has been a subject of controversy as some experts consider the budget increase insufficient and are pooling for a even higher ceiling. Recently elected president Trump has requested that all NATO members increase their defense expenditures to at least 4% of the budget. Others argue that the problem for a modern defense



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doesn't necessary sit in the budget but rather in the management of defense resources allocated to defense.

2. The NATO Defense Budget Challenge

In terms of NATO countries, the discussion has been orientated ever since the first Trump administration on whether the European member states are doing enough in increasing its defense expenditures compared to the United States.

In **Figure 1** we have a better view on how defense expenditures have evolved throughout NATO and some observations can be made.

	Million US dollars										
Current prices and exchange rates	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023e	2024e
Albania	178	132	131	145	176	197	197	224	231	397	516
Belgium	5,200	4,204	4,258	4,441	4,845	4,761	5,324	6,245	6,904	7,622	8,519
Bulgaria	747	633	671	724	962	2,159	1,121	1,276	1,440	1,992	2,325
Canada	18,172	18,689	17,708	23,700	22,399	22,572	23,330	25,502	25,898	27,991	30,495
Croatia	1,064	883	837	926	966	1,001	983	1,361	1,285	1,441	1,624
Czechia*	1,975	1,921	1,866	2,259	2,750	2,982	3,199	3,915	3,895	4,538	6,834
Denmark	4,057	3,364	3,593	3,780	4,559	4,487	4,886	5,274	5,473	8,140	9,940
Estonia*	514	463	497	541	615	637	719	749	820	1,238	1,437
Finland	3,991	3,401	3,418	3,536	3,825	3,990	4,156	4,145	4,726	6,266	7,308
France	52,022	43,496	44,209	46,133	50,507	49,493	52,519	56,457	52,238	59,379	64,271
Germany	46,176	39,833	41,606	45,470	49,772	52,549	58,652	62,054	61,405	73,138	97,686
Greece	5,234	4,520	4,637	4,752	5,388	5,019	5,492	8,006	8,488	6,731	7,684
Hungary	1,210	1,132	1,289	1,708	1,615	2,190	2,767	2,410	3,270	4,360	4,889
Italy	24,487	19,576	22,382	23,902	25,641	23,559	30,084	33,140	31,512	33,857	34,462
Latvia*	294	282	403	485	710	692	743	824	857	1,254	1,421
Lithuania*	428	471	636	817	1,057	1,094	1,176	1,308	1,738	2,165	2,300
Luxembourg	253	250	236	326	356	381	426	403	461	642	785
Montenegro	69	57	62	65	75	74	83	91	86	114	162
Netherlands	10,349	8,673	9,112	9,643	11,172	12,067	12,838	13,916	13,899	16,764	21,460
North Macedonia	124	105	104	101	120	146	154	204	221	267	353
Norway	7,722	6,142	6,431	6,850	7,544	7,536	7,228	8,438	8,694	8,799	10,606
Poland*	10,107	10,588	9,307	9,940	11,857	11,824	13,363	15,099	15,338	26,476	34,975
Portugal	3,007	2,645	2,616	2,738	3,249	3,299	3,273	3,899	3,578	4,241	4,627
Romania*	2,691	2,581	2,645	3,643	4,359	4,608	5,056	5,299	5,197	5,605	8,644
Slovak Republic	999	987	1,004	1,056	1,298	1,802	2,049	2,066	2,090	2,445	2,841
Slovenia	487	401	449	477	547	572	568	763	777	914	949
Spain	12,634	11,096	9,975	11,889	13,200	12,630	12,828	14,849	16,451	18,875	21,269
Sweden	6,205	5,103	5,017	5,229	5,396	5,560	5,984	9,071	8,562	9,848	13,428
Turkey	13,577	11,953	12,644	12,771	14,168	14,089	13,396	13,137	12,292	16,614	22,776
United Kingdom	65,692	59,505	56,362	55,771	60,380	59,399	63,500	71,927	70,846	76,939	82,107
United States	653,942	641,253	656,059	642,933	672,255	750,886	770,650	824,094	834,977	875,603	967,707
NATO Europe and Canada	289,276	254,422	255,595	275,102	300,167	301,674	325,953	358,836	355,382	419,205	506,692
NATO Total	943,218	895,675	911,654	918,035	972,422	1,052,560	1,096,603	1,182,930	1,190,359	1,294,808	1,474,399

Fig 1 NATO countries defense allocation 2014-2024 [6]

The US remains the highest contributor to NATO with a medium budget of around 800 billion dollars allocated to defense in the past decade. On the other hand, we can highlight that the rest of the organization including NATO Europe and Canada have almost doubled their participation to the defense budget, from 290 billion dollars in 2014 to around 506 billion dollars in 2024. This is more than the overall increase of the overall NATO allocation to defense which is around 33% in the last decade.

There are two main areas of concern when it comes to the management and evolution of the Defense budget in NATO, both on the European and American continent.

First of all, most of the members lack basic ammunition and other defense assets as their defense expenditures have mostly been spent to major acquisition of high-tech equipment suitable for NATO's joint capabilities that were defined in previous NATO strategic concepts on dealing with emerging risks and threats more orientated towards cyber warfare and hybrid warfare but not the conventional warfare that the Russian Federation is executing in Ukraine.

The second challenge is driven by the concept of Guns and Butter effect. For most western countries investing in defense while neglecting other areas of public expenditures is not an option. Most of the European Union countries that are members of NATO have followed for the past 50 years a soft power model where economic growth has been the main pillar and



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priority in government policies rather than the hard power approach of developing a strong and modern military. For this reason, there is gap in report to both the US and Russia who have maintained their high developed military capabilities even following the end of the Cold War. Even with increased defense budgets, it will take a mid-term time frame for most of the NATO member states excluding the US, in catching up and developing defense assets that could answer to today's current risks and threats that might mean even a direct conflict with the Russian Federation.

4. Evolution of the Russian Defense Budget

When it comes to the Russian Federation the evolution of the Defense Budget has been realized in accordance to Russia's ambition following the ascension to power of president Vladimir Putin. The budget has been marginally increasing following Russia's ambitions in key three moments: the invasion of Georgia in 2008 and the annexation of Abkhazia and South Ossetia, the Crimean Invasion and annexation in 2014 and the full-scale invasion of Ukraine in 2024. This evolution is visible in the Graph that we have presented in **Figure 2**.

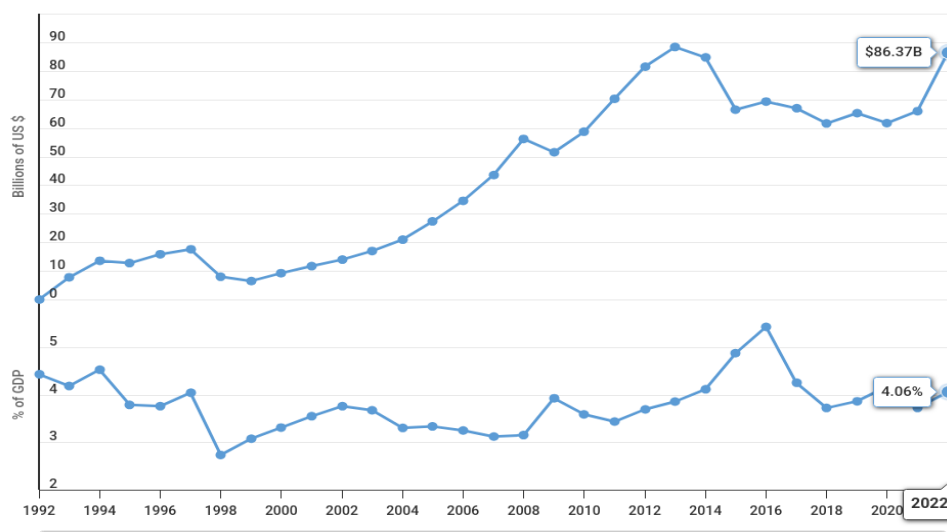


Fig 2. Evolution of the Russian Defense Budget [4]

While the NATO member states operate their defense policies and expenditures based on an economy of piece, since 2022 Russia's economy has shifted to a war driven economy. Because of this the defense budget has become the main priority for defense allocations. In such, in 2024, a third of the entire budget of roughly 86 billion dollars has been allocated to defense related activities. While Russia has never declared a full war on Ukraine and the official terms used are still those of "special military operation" or "hybrid war" it is ultimately clear that the entire economy is driven by defense strategic objectives. Western countries have tried to limit the potential for Russian allocations to war by trying to impact the biggest sources of funding to Russia's national GDP, respectively the incomes from the energy field, Russia being a major producer in oil and gas, and therefore a big exporter of these resources. The effort from the West



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in terms of economic sanctions has decreased the incomes from oil and gas exports from 1.2 billion dollars to just around 600 million dollars in 2024. [1] Other savings from the Russian GDP that have went to defense in 2024 and will continue to do so in 2025 mean a reshape of the social welfare state in Russia. Social policies will be affected in this new budget design, while inflation continues to also go up and the Russian currency, ruble continues the devaluate at record numbers. Private companies are also going to be submitted to a higher taxation system that will be applied starting with 2025. The Central Bank of Russia with the aim of stopping an inflation that has toppled 9% in 2024, is trying to increase the income tax that is currently 21%. This has scared company owners, regardless of their sympathies to the Putin regime [3]. Specialists have warned the government that the Central Bank intervention might even affect the defense industrial complex which will also be affected by the increased taxes. [5]

With the budget designed for such a war-time economic approach, specialists [2] consider that the Russian economy will collapse in a similar fashion to the way it collapsed at the end of the 80's bringing an end to the Cold War. A reason is that commitment to major allocations for investments in defense. In 2024, around 30% of the budget, approximately 100 billion dollars were in the form of apportionments for major acquisitions in defense. Separately another 10% of the budget was spent for actions correlated with the activity of the Ministry of Interior Affairs. While a total of 40% of the budget is already a big element of pressure on any national budget, if it is allocated to defense, the Russian Federation wishes to increase that percentage in 2025 with the hope that this will bring decisive military victories on the Ukrainian front. Besides the direct costs of investing in the war with visible effects in the defense industry which has increased production by a rate of 30% there are other indirect costs in Russia's defense budget. [7]

The ministry of labor is spending a large part of its budget with veterans and families and those who have passed fighting in the war. Other expenditures are going to subsidized funds that are being used to rebuild the so-called provinces that Russia has illegally occupied from Ukraine. A budget of around 500 trillion rubles was allocated to this category of funds in 2024.

The Russian Federation is optimistic that the overall budget will increase because of regulatory price increases in oil and gas at international level. However, expert opinions differ on this topic. Several factors might impact the price at which oil is transitioned on the international market. The end of Assad regime in Syria might enable the development of a new gas pipeline from the Middle East through Turkey and eventually to Europe that could further decrease European dependency on Russian oil and gas. Another event worth mentioning is the fact that on December the 12th of 2024, OMV has abruptly ended its contract of oil distribution with Gazprom. The impact of this decision will also trigger long term effects of the fluctuation of energy prices.

5. Conclusions

While the current total defense budget of the EU is more than 4 times the defense budget of the Russian Federation, the evolution of this budget for the past 10 years has been a closer one that it has looked on paper. The Russian Federation had an advantage and it increased its defense expenditures starting earlier, from the beginning of the Putin administration in the early 2000's. This has allowed the Russian Federation to take an advantage in developing more capabilities and shifting its industry complex to a much more efficient one (Russian Federation defense industry running on *war speed*, not *peace speed*).



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As we know from the reality of scarce resources and defense management rarely do cost and benefits happen together. For this reason, the increased Russian defense budget, has given the Russian Federation an edge over NATO in terms of military outputs, one that will take some time to reduce.

Furthermore, there is a visible difference in how different NATO countries have approached the consensus to increase defense expenditures. While for countries like Poland, Romania, the Baltic States there has been a general desire to go beyond the 2% all the way up to 4% and more because of the proximity of the war in Ukraine to their own borders, other countries have delayed any investments in defense up until 2022. The pressure from the USA that all member states contribute more to NATO is a correct one from a conceptual point of view, but in technical terms, due to increase in defense allocation being realized just marginally as national budgets can only work in that way, the American presence in Europe remains crucial in front of an expanding Russian army, whose ambitions in positioning itself as a regional power from a military standpoint remains as a priority regardless of any economic fluctuations that might affect is overall capacity to finance the conventional wars it has set up to develop.

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**THE USE OF PERFORMANCE INDICATORS IN THE
EVALUATION PHASE**

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Abstract

The concept of performance management has evolved over time, adapting to changes in organizational structures, management theories, and technological advancements. While formal performance management systems may be relatively recent developments, the principles of managing and evaluating employee performance have roots in early organizational management practices.

Throughout history, performance management has evolved from simple measurement and control systems to more holistic approaches focused on aligning individual and organizational goals, fostering employee engagement, and driving continuous improvement. As organizations continue to adapt to new challenges and opportunities, performance management will likely continue to evolve to meet the needs of modern workplaces.

Key words: performance management; organizational structures; improvement

1. Introduction

Performance management is a vital aspect of organizational success, encompassing the processes and strategies employed to optimize employee performance and achieve overarching goals. At its core, performance management involves setting clear objectives, measuring progress, providing feedback, and implementing actions to enhance performance.

Key Performance Indicators (KPIs) serve as essential tools within this framework, offering quantifiable metrics to evaluate the effectiveness of decision-making processes. By utilizing KPIs, organizations can assess the impact of decisions on performance outcomes, identify areas for improvement, and make data-driven adjustments to enhance efficiency and effectiveness.

Whether measuring productivity, quality, customer satisfaction, or financial performance, KPIs provide valuable insights into the alignment of decisions with organizational objectives. In this study, we'll explore the role of KPIs in the evaluation phase of Planning Programming Budgeting Execution Evaluation System (PPBEES), highlighting their role in driving informed decision-making and fostering continuous improvement within organizations.

2. Introduction to PPBEES and Key Performance Indicators (KPIs).

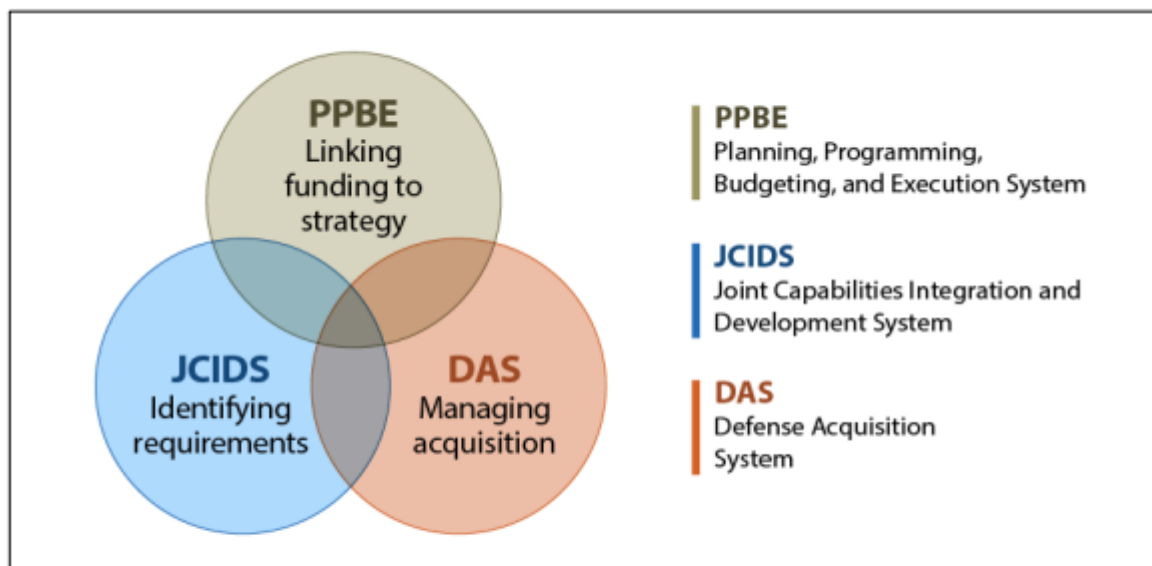
According to Congressional Research Service, the PPBEES is a cyclic process containing four distinct, but interrelated phases: planning, programming, budgeting, and execution. In addition to establishing the framework and process for decision making on future programs, the process permits prior decisions to be examined and analyzed from the viewpoint of the current environment (threat, political, economic, technological, and resources) and for the time period being addressed. The ultimate objective of PPBEES is to provide operational commanders the best mix of forces, equipment, and support attainable within fiscal constraints.



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Figure 1. DOD Decision-Support Systems



Source: Figure created by CRS based on DOD, *Defense Acquisition Performance Assessment Report*, February 2006, p. 4, archived at <https://www.airforcemag.com/PDF/DocumentFile/Documents/2006/DAPA-Rpt-012706.pdf>.

Notes: JCIDS is Joint Capabilities Integration and Development System; PPBE is Planning, Programming, Budgeting, and Execution; and DAS is Defense Acquisition System.

Figure 1: DOD Decision Support System

In the evaluation phase of PPBEES, programs are rigorously assessed to determine their effectiveness and impact. This evaluation provides crucial insights into the success or shortcomings of implemented initiatives. Decision-makers rely on this data to inform future resource allocation, program adjustments, and strategic planning. By analyzing program outcomes, decision-makers can make informed choices to optimize resource utilization and improve program performance. The evaluation phase plays a pivotal role in fostering accountability, transparency, and evidence-based decision-making within the PPBEES framework.

Key Performance Indicators (KPIs) are a type of measure used to evaluate an organization's performance against its strategic objectives. KPIs help to cut the complexity associated with performance tracking by reducing a large amount of measures into a practical number of 'key' indicators.

KPIs are essential for monitoring the performance of companies, departments, or individuals in relation to specific targets or goals. They are a reliable measurement tool, aiding decision-making and offering valuable insights into efficiency and productivity. KPIs can be categorized into various types based on their focus and relevance (financial, operational, customer, quality...).

Effective use of KPIs requires selecting indicators aligned with organizational goals, regularly tracking and analyzing data, and using insights to drive continuous improvement and informed decision making.

Performance measurement is essential in program evaluation as it provides quantitative data to assess the effectiveness and efficiency of interventions. It allows stakeholders to track



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progress, identify areas for improvement, and make informed decisions about resource allocation. Moreover, it facilitates accountability by demonstrating the impact of programs on intended outcomes and enables comparisons across different interventions or time periods. Overall, performance measurement enhances transparency and informs evidence-based policymaking, ultimately leading to more impactful and sustainable programs.

Key Performance Indicators (KPIs) are quantifiable metrics used to evaluate the success of an organization, department, or individual in achieving specific objectives. Lagging indicators are retrospective measures that assess past performance, such as revenue, profit, or customer satisfaction scores.

Leading indicators are predictive metrics that provide insight into future performance trends, such as customer retention rates, employee engagement scores, or new product adoption rates. Both types of indicators are essential for comprehensive performance evaluation and strategic decision-making.

Elements of Key Performance Indicators (KPIs)

Specificity: Clearly defined to focus on particular aspects of performance

Measurability: Quantifiable and allow for objective assessment over time

Achievability: Realistic and attainable within organizational resources

Relevance: Aligned with strategic objectives and critical to organizational success

Timeliness: Offer timely information for prompt action and decision-making

KPIs play a crucial role in evaluating performance by providing quantifiable measures of success against predefined objectives. They help identify trends by tracking performance over time, revealing patterns and deviations that require attention.

Additionally, KPIs inform decision-making processes by offering actionable insights based on real-time data, enabling organizations to make informed choices to optimize performance and achieve strategic goals.

KPIs serve as valuable tools for evaluating decision processes across various organizational functions. In strategic planning, KPIs can assess the effectiveness of strategic initiatives by measuring progress toward long-term goals, such as market share growth or revenue targets. In resource allocation, KPIs provide insights into the efficiency and effectiveness of resource utilization, helping identify areas of over or underinvestment. For risk management, KPIs track key risk indicators to assess the likelihood and impact of potential risks, enabling proactive mitigation strategies.

By aligning KPIs with decision-making objectives, organizations can evaluate the success of decision processes, optimize resource allocation, and mitigate risks to achieve strategic objectives effectively.

KPIs provide insight into the effectiveness of decision processes in various organizational functions, helping companies make informed decisions to achieve their strategic objectives.

Decision Process	KPI	Description
Strategic Planning	ROI (Return on Investment)	Measures the profitability of strategic investments relative to their cost. A higher ROI indicates more effective strategic decisions.
Resource Allocation	Time-to-Market	Tracks the time taken to develop and launch new products or services, reflecting the efficiency of resource allocation decisions.



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Customer Engagement	Customer Satisfaction Scores	Gauges customer perceptions of products, services, or experiences, reflecting the effectiveness of decisions related to customer engagement and service delivery.
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Table 01: Examples of KPIs

3. KPIs used in the evaluation phase

In the evaluation phase of the Planning, Programming, Budgeting, Execution, and Evaluation System (PPBEES), Key Performance Indicators (KPIs) play a crucial role in assessing the effectiveness and efficiency of various processes and activities. The evaluation phase typically involves three main sections:

Performance evaluation KPIs are vital for assessing the effectiveness and efficiency of programs and projects within the PPBEES framework. These KPIs provide insights into the achievement of objectives, the quality of deliverables, and the overall impact of activities.

Two key categories of performance evaluation KPIs include process metrics and outcome metrics, process metrics focus on measuring the efficiency of workflows and procedures, such as cycle time, error rates, and adherence to standards. These metrics help identify areas for improvement in processes and resource utilization.

Outcome metrics, on the other hand, assess the tangible results and impacts of programs and projects, such as customer satisfaction, revenue generation, and market share. Outcome metrics provide stakeholders with a holistic view of the value created by activities, guiding decision-making and resource allocation.

Additionally, performance evaluation KPIs often include benchmarks and targets against which actual performance is compared. Establishing clear benchmarks and targets enables stakeholders to monitor progress and identify deviations from expected outcomes.

KPIs also facilitate performance reporting and accountability, ensuring that stakeholders are informed about the effectiveness of programs and projects. By leveraging performance evaluation KPIs, organizations can drive continuous improvement, optimize resource allocation, and enhance the overall efficiency of operations within the PPBEES framework.

Performance documents: Performance monitoring and evaluation require, to be of value operational, sufficient structured computerization validly allowing the establishment of projects, decision-making and exchanges and comparisons between various public policy stakeholders.

For that, Tunisia for example in its budget management system by objectives (BMBO: it is similar to PPBEES) uses Annual Performance Projects (APP) and Annual Performance Report (APR), they are a documents which contains KPIs that used to measure performance result for each program or sub program:

The annual performance plan (APP): is designed to better reflect the results of the public action, based on a model drawn up by the BMBO unit and the working group on program management based on performance.

The APP contains indicators aimed at monitoring the dimensions of performance of a program relating to:

- Management efficiency.
- The quality of the services provided to the user.



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The annual performance report (APR): the ministries drew up the annual performance report at the end of management, and justify the non achievement of objectives fixed.

The APP and the APR are presented according to an identical structure in order to facilitate reconciliation of documents. As important as the presentation of the results, the analysis and interpretation of these: explanation of the differences between objectives (or targets) and achievements, weight of the context, new action levers to be mobilized.

In addition to performance documents, there is performance tools that enable to track and check activities such as:

IS Performance: The head of the mission and The program manager needs to have a dashboard merging the operational results of the structures in charge of the execution of public policies, and giving him the possibility of an instantaneous follow-up of the evolutions relating to the strategic results of the mission and program at which he is accountable.

Enterprise Resources Planning :(ERP): The ERP aims to standardize the state financial IT system and to comply with the new provisions introduced by the LOB (organic budget law promulgated in February 2019). Concretely, it is a question of simplifying a very heterogeneous existence, grouping several applications by an information system which allows an integrated financial management.

INJEZ: The program manager needs to have instantaneous information about the projects which are inscribed in the (APP). This system can provide an instant report on the financial and physical realization of the projects.

All these documents and tools contain performance KPIs that enable decision-makers to take the good decisions in the good time.

Financial evaluation KPIs are essential for assessing the fiscal aspects of programs and projects in the PPBEES evaluation phase. These KPIs provide stakeholders with insights into budget utilization, cost management, and the financial performance of activities.

Two primary categories of financial evaluation KPIs include budgetary metrics and cost-efficiency metrics. Budgetary metrics focus on tracking budget allocations, expenditures, and variances, ensuring that resources are used in accordance with financial plans. Examples of budgetary metrics include budget utilization rates, expenditure trends, and adherence to budget constraints.

Cost-efficiency metrics measure the effectiveness of resource utilization in achieving desired outcomes. These metrics include cost per unit of output, cost per beneficiary served, and cost per outcome achieved. Cost-efficiency metrics help decision-makers identify opportunities to optimize resource allocation and improve the cost-effectiveness of programs and projects. Moreover, financial evaluation KPIs often includes ROI (Return on Investment) analysis and cost-benefit analysis results..

These financial KPIs provide stakeholders with insights into the financial performance and sustainability of programs and projects, guiding investment decisions and resource allocation.

Strategic evaluation KPIs focus on assessing the alignment of programs and projects with organizational goals, mission, and strategic priorities. These KPIs provide insights into the contribution of activities to the achievement of strategic objectives and the overall success of the organization.

Two key categories of strategic evaluation KPIs include alignment metrics and impact metrics. Alignment metrics measure the extent to which programs and projects align with strategic priorities and objectives. Examples of alignment metrics include the degree of alignment with



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strategic plans, the relevance of activities to organizational goals, and stakeholder engagement levels.

Impact metrics assess the tangible outcomes and benefits generated by activities in support of strategic objectives. These metrics include market share growth, customer retention rates, and the attainment of strategic milestones. Impact metrics help stakeholders gauge the effectiveness of programs and projects in driving organizational success and competitive advantage.

Additionally, strategic evaluation KPIs often include indicators related to innovation and stakeholder engagement. Innovation metrics measure the level of innovation within programs and projects, such as the number of new products or services developed, patents filed, or process improvements implemented. Stakeholder engagement metrics assess the degree of involvement and satisfaction among key stakeholders, including customers, employees, and partners. These KPIs help organizations understand their competitive position, identify opportunities for innovation and growth, and enhance stakeholder relationships.

By leveraging strategic evaluation KPIs, organizations can ensure that resources are allocated in alignment with strategic priorities, driving sustainable growth and long-term success.

4. Conclusions

In conclusion, Key Performance Indicators (KPIs) serve as indispensable tools in the evaluation phase of the Planning, Programming, Budgeting, Execution, and Evaluation System (PPBES). Across three crucial sections—performance evaluation, financial evaluation, and strategic evaluation—KPIs offer quantifiable metrics to assess the effectiveness, efficiency, and alignment of programs and projects with organizational objectives.

In the performance evaluation realm, KPIs enable stakeholders to gauge the success of activities by measuring operational efficiency and outcome achievement. Financial evaluation KPIs provide insights into budget utilization, cost-effectiveness, and the overall financial health of initiatives. Meanwhile, strategic evaluation KPIs focus on assessing alignment with organizational goals, innovation impact, and stakeholder engagement.

Through the judicious application of KPIs, decision-makers can make informed choices, optimize resource allocation, and drive continuous improvement within the PPBES framework. By leveraging these metrics, organizations can ensure accountability, transparency, and strategic alignment, ultimately fostering sustainable growth and long-term success. Thus, KPIs stand as indispensable instruments in the evaluation phase of PPBES, guiding organizations toward their desired outcomes and strategic objectives.

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AVOIDING UNSUSTAINABLE DEFENSE RESOURCES
MANAGEMENT PRACTICES: LESSONS FROM THE U.S.
MILITARY MISSIONS IN AFGHANISTAN

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Abstract:

Defense resources management is a complex process aimed at accomplishing the assigned missions while making the optimal use of the limited financial resources. However, its efficiency and sustainability are truly tested when it comes to effects created on the ground. Based on the long-term meaning of sustainability, this paper looks into the recently ended mission of the US military forces in Afghanistan, to discover whether defense resources were properly implied and to identify lessons that could contribute to enhanced sustainable results in the future. Therefore, this paper adopts an exploratory qualitative approach, based on the case study method, which reveals important lessons that should generate future changes, not only in the way resources are planned but also in their sustainable usage. At a time when there are voices that question the agility of the PPBE process, and there is also evidence related to a high level of waste generated in Afghanistan, this paper supports the idea that the way things are done should be reconsidered and raises awareness to look more into the long-term effects of the military decisions.

Key words: long-term; sustainability; capability; defense resources; waste; PPBES

1.Introduction

Efficiency in utilizing the defense resources is a permanent desideratum at the military management level. It involves using resources without wasting them [1]. However, this is not such an easy task, not even for the American military managers, though the country is a pioneer in solutions that prove their efficiency even today. An example in this respect is the *Planning, Programming and Execution System/PPBES* developed in this country in 1961, with applicability in the entire American public system [2], which was adopted at a larger scale in different other countries and which ensures the base of public spending [3]. But mentioning the PPBES does not have the only purpose of highlighting the fact that, taking into account the broad experience in managing public resources, the institutions of this country should not have flaws in terms of public spending. The idea is to highlight that the long-term vision, which triggers this process, should not be lost when it comes to involving the defense resources on-hand in different types of missions.

Consequently, besides efficiency, there is another aspect that raises a lot of debates when it comes to public spending: sustainability. This term has multiple meanings, the most prominent being: 1) a superior form of economic development that looks not only into economic gains, but also into social and environmental benefits [4]; (2) the long-term ability to support the readiness of military forces [5]; and (3) the long-term effects of some measures/actions [6]. Therefore, it should be clearly stated from the beginning that this paper offers a perspective focused on the third meaning, though there are a lot of aspects that could be tackled in relation with the U.S. military from the other two angles.



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Therefore, this paper aims to examine, through the case study method, the extent to which the American defense resources were wisely allocated in Afghanistan, with an accent on the sustainability perspective or the durable effects, versus waste. The main goal is to determine whether the U.S. military owned at that moment a reconstruction capability that allowed them an optimal allocation of resources in this type of missions. To accomplish this goal, the research question that needs to be answered is: *how sustainably were the main types of defence resources allocated to support the missions in Afghanistan?* Derived from this, there is also a subsequent research question: *why should the lessons identified in Afghanistan count?*

The paper analyzes the reconstruction mission in Afghanistan from a new perspective, starting from reasoning that the long-term approach should be taken into consideration when involving the existing capabilities in a mission. Then, the US *DOTmLPF-P framework* was used to check the suitability of the military capability involved in the reconstruction mission of Afghanistan, which was very helpful in organizing and synthesizing the great amount of data available on this case. The main result consists of the recommendation to integrate the long-term approach not only in the planning phase of the PPBE process, but also after the capabilities had been operationalized.

2. Unsustainable U.S. Defence Resources Management Practices in Afghanistan

This section is three-folded. The first subsection arguments the need for maintaining the long-term focus on the effects that need to be created through involving the existing defense resources in various types of missions. Additionally, the second subsection brings into light the unsustainable effects generated in Afghanistan. The framework used and the examples provided contribute to establishing whether the US military owned a reconstruction capability that could have generated durable effects, taking into consideration that the reconstruction missions differentiate from humanitarian ones through the long-term benefits that have to be provided [7]. Last but not least, the third subsection offers a list with the lessons identified after the case study.

2.1 The PPBE framework for U.S. Defence Resources Management and Sustainability

The PPBE instrument for the management of defence resources mentioned in the introduction of this paper was designed to ensure a long-term integrated planning of defence resources used by the U.S. Department of Defense [8], which encompasses mission alignment with all types of defense resources needed for its accomplishment [9]. There are multiple reasons to consider that there should be a strong connection between this process and the need for sustainable measures in managing the available defense resources, at least from the perspective of the third meaning of sustainability, which refers to durability. For instance, the long-term perspective should not be related to the time-consuming process associated with developing a capability through the PPBES instrument [2], but should aim to generate long-term beneficial effects.

This long-term orientation can be sustained by the analyses included in the process related to the PPBES, on one hand, and, on the other hand, by one of the principles which govern defense resources management. From the analyses point of view, the long-term approach is



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given by the usage of estimates based on life-cycle cost analysis and cost-benefit analysis. While the long-term view is by default integrated when dealing with assessing costs over the entire life-cycle of a product, the cost-benefit analysis in the military domain does not provide such an evident durable aim, as it intends not only to establish the policy of allocating defense resources along different missions and goals, but also to make the best choice between various projects that contribute to mission accomplishment [10] and the associated long-term benefits [11]. From the principle's perspective, the idea of durability is given by the fact that consequences of current decisions have to be projected into the future by making use of multi-year plans associated with the force and its financial support [8].

Another argument which supports the connection of the PPBE instrument with the durable results stands into the innovation brought by this instrument, which is mostly supported by its first phase. Thus, the planning phase takes into consideration goals that need to be reached on the long-term [12].

But the capability development process, which starts with the strategic planning phase in PPBE, is not the only one which generates consumption of defense resources. Once the military systems and structures were created and manned to accomplish certain missions which contribute to reaching the established end state, it is important to use them accordingly, and not to deviate from the need that stood at the core of their development. In other words, practices that are associated with the effective usage of the already developed capabilities could also generate expenses that were not envisioned during the operational planning process. This aspect is seen as a shortfall of the actual way of using the PPBE instrument, which is blamed of not taking into consideration the reality on the ground [2], is *“too slow and inflexible to meet warfighter needs”* [Apud 3]. As a consequence, there are voices that support the idea of getting every request for resources through the PPBE process and the necessity to mention the budgetary sources associated with sustainable projects [13], at this moment the process covering *“almost everything DoD does”* [3], but not quite everything, as it will be shown in the following subsection. However, this “everything” is not clearly developed into the analysed literature. Therefore, the following subsection provides a brief analysis of the way defense resources were used in Afghanistan, to identify the aspects that could be included in the PPBE process and valuable lessons to avoid unsustainable defense resources management practices in the future.

2.2 Unsustainable US Defence Resources Management Practices in Afghanistan

It all started with the 9/11 terrorist attacks on emblematic infrastructure elements in the USA, that determined the American officials to send military troops in Afghanistan, fact considered, twenty years later, an *“unsustainability trap”*, taking into account the effects generated not only on the US defense resources, but also on the host nation reconstruction [14]. Although this paper will focus on the effects generated on the US defense resources, the reconstruction perspective is very important, as the initial mission established for the military forces changed from a predominant combat one, to a reconstruction support mission. The figure below shows the transition from one type of mission to another and the costs supported between 2002-2021:



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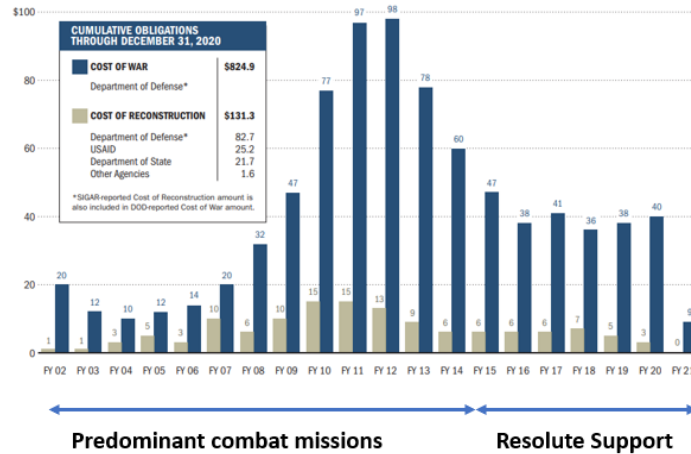


Fig. 1 *The US financial effort in Afghanistan*
(combat and reconstruction missions) - annual and total (2002-2021) [Apud 15].

Once the type of the mission had changed, there should have also appeared a change in the way funds were allocated [16]. But the presented figure indicates this change did not happen and although the military forces should have focused more on reconstruction programs, the level of money received for this destination was lower than the one directed towards combat activities. Additionally, as it can be noticed from the above figure, they were assigned two types of missions at the same time, as the costs associated with combat activities were higher than the ones directed to reconstruction. These were only a few aspects which contributed to failure in reconstruction mission. Another major factor that generated non-durable effects was that the reconstruction was carried out mostly by the military instrument of power (63% as it results from data presented in the figure above), although other specialised actors should have been in lead.

The lack of an end state and of a strategy to guide the mission accomplishment, coupled with the one-year planning horizon, were also signalled as sources of failure [7]. This aspect is crucial taking into consideration the wide area of reconstruction activities [7] assigned to the military forces, that are briefly presented in the following figure:



Fig. 2 *The US military involvement in reconstruction activities*



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Analysing all these reconstruction activities, one cannot help wonder: *Were the military forces prepared for such diverse actions?* or, *Had the US military a capability developed for this kind of missions?* To answer these questions, the *DOTmLPF-P framework* will be used, as it comprises the lines that the US decision-makers should consider when developing a capability (doctrine, organization, training, materiel, leadership & education, personnel, facilities, policy) [17].

Firstly, from *doctrine* point of view, it cannot be considered that all the activities mentioned in Figure 2 are covered, the *US Stabilization and Reconstruction Doctrine* being seen as a “failure” when it comes to supporting transition from authoritarian regimes like the one in Afghanistan, as it does not provide sufficient details related to activities that enter under its umbrella [18]. It refers generically to applying the American model of democracy, but does not take into account actions aimed at developing the country, remaining at the idea that military forces should contribute to stabilizing a conflict environment on the near or intermediate term [18]. However, it seemed that the American model of reconstruction was not suitable for Afghanistan. For instance, the military forces developed in this country costly infrastructure projects that the local authorities, which were not consulted, were not able to maintain, fact that generated an additional financial effort of \$800 million [19]. Although recommendations to assess the sustainability of the Afghan government’s ability to finance the developed projects had been issued, they were not respected, the amount of waste related to a single unsustainable project/program exceeding \$11 billion [19]. These facts also alter the *facilities* side of the US DOTmLPF-P framework, enhancing the idea of an incomplete reconstruction capability at the disposal of the US military.

Moreover, the components referring to *organization, training, materiel, leadership and education, and personnel* were also disregarded. As a result, a lot of the necessary resources came from outside the military structures, contractors being involved at a large scale, most of the times as an “*implicit*” solution, with results difficult to monitor and evaluate [19]. Additional drawbacks can be associated with the *personnel* component, as the human resource involved by the US military in Afghanistan was insufficient, unable to cope with the variety of tasks [7], and above these, involved in activities that should have been performed by the Afghan forces [20]. What is more, is that the availability of the needed human resource was not evaluated when the reconstruction mission was planned [7], fact that generates doubts related to the application of the PPBE process in this case.

The *leadership* component was also avoided, as the decision-makers disregarded the reality on the ground. They failed in understanding the Afghan cultural context and their measures were not adapted to the real needs of the population [7]. From the *educational* component perspective, the available data show that the insufficiency of personnel was tackled through a decrease in the level of employment criteria [7], fact that can also explain the unsustainable results. In terms of *training*, the best unsustainable example is associated with the US military forces involvement in the training of the female Afghan military, as the withdrawal from Afghanistan gave Talibans the opportunity to take discriminatory measures against women in this country [21]. But the human and financial effort of the US military forces remained.

The *material* component can also offer insights in terms of unsustainable effects. For example, the great volume of supplies and maintenance services provided to the Afghan forces stood at the basis of their dependence on the US military support, offering fast, but non-durable solutions [20]. Moreover, some logistic solutions provided by the American forces to the Afghan



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counterparts did not pass the life-cycle cost analysis test. For example, in 2008, when the spare parts were no longer available on the market, the US military leaders decided to spend \$549 million to equip the Afghans with the G222 transport aircraft; this decision proved to be unsustainable in only six years, when the equipment was sold as waste for only \$40,257 [7]. In fact, the waste in this case is represented by the difference between the amount spent and the one recovered, without taking into consideration further expenses with training the human resource or others like this.

Last, but not least, from the *policy* component perspective, it can be also stated that the US military lacked a reconstruction capability in Afghanistan. This statement is supported by the fact that specialists recommended that future reconstruction missions be planned on the idea of sustainability [7], the long-term benefits standing at the core of reconstruction efforts.

2.3 Lessons from the US Defence Resources Management Practices in Afghanistan

Taking into consideration the aspects presented so far, we identified several important lessons that should be considered, to avoid the unsustainable defense resources management practices. These are briefly presented in the following table:

Lesson	Content
Lesson 1	Avoid involving the military structures in activities for which they were not prepared for
Lesson 2	If military structures must be involved in activities for which they were not prepared for, involve also other specialised instruments of power (collaborative approach)
Lesson 3	If the end state is vague and there is no clear strategy, put a stronger accent on information provided and the reality on the ground
Lesson 4	If the type of the mission changes, adapt the resource management practices
Lesson 5	Always take into consideration the cultural context
Lesson 6	Do not let the yearly budget decide what to do on long term
Lesson 7	Outsourcing should be considered only after studies had proved it is an optimal alternative
Lesson 8	Identify clear indicators of sustainability and use them in planning reconstruction mission (and not only)
Lesson 9	Embrace the long-term perspective in the way existing capabilities are used
Lesson 10	Always take into consideration a sustainable guided policy in solving the tasks

Table 1 Lessons identified

3. Conclusion

From the facts presented in the previous chapter, it cannot be inferred that the US military had a wise approach in allocating the defense resources in the reconstruction mission in



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Afghanistan. The evidence presented in this study shows that the US military forces lacked such a capability, conclusion supported by the fact that their specific doctrine was too broad to answer to the wide range of reconstruction activities. Moreover, the data that indicate the reconstruction capability missing elements, support the improper use of the military instrument of power. This is, in our opinion, a very clear case of using wrong instruments and achieving nothing more than negative effects.

What is more, from the PPBE perspective, the reconstruction mission in Afghanistan and the associated waste, highlight the idea of other researchers, who stated the necessity to pass every financial request through the PPBE cycle. If this had happened, the amount of waste would have considerably decreased, in our opinion. However, taking into consideration the long timeframe associated with this process, it becomes obvious that it would have been too slow for the needs of that mission, without taking into account a high scale combat mission. Consequently, the results of the mission in Afghanistan should be seriously taken into consideration and stand at the base of PPBE process adaptation to become more agile.

Another important aspect refers to the reactive nature of the defense resources management applied in Afghanistan. The US military decision-makers longed for a more rapid intervention in Afghanistan, had no vision related to the real amount of effort and no proper reaction to adapt to the recommendations issued by specialists. This could be, in our view, an explanation for the avoidance of the in-place capability development instruments. They relied heavily on the existing resources and tried to make the best use of them, but did not succeed, as this type of mission was not envisioned from the beginning, in the strategic planning phase. Moreover, without a clearly defined end state of the mission, it can be considered that the operational planning process was inexistent, generating the poorest results. Thus, two major processes, namely the capability development process and the operational planning process, did not prove their efficiency, because they seemed unsuitable for that context.

Finally, the case of the reconstruction mission in Afghanistan clearly shows an unbalanced ratio between the financial effort and the unsustainable results. It also reveals the high determination of the higher-level decision-makers to use the military forces, in a first-feeling that this measure will imply a lower level of financial effort. From that perspective, we recommend that each involvement of the military forces in combat or other types of missions be treated similarly with the PPBE process, though a more rapidly alternative of this process should be used. Another recommendation is to avoid the usage of defense resources in activities they were not meant for. From this perspective, the case related to the reconstruction mission in Afghanistan is, in our view, very eloquent, reminding the decision-makers the limits of the military instrument of power and the negative consequences associated with their neglect.

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**HUMAN FACTORS IN MULTI-DOMAIN OPERATIONS:
NAVIGATING THE BIVALENT DYNAMICS OF HUMAN
TERRAIN AND MILITARY HUMAN CAPITAL WITH A
HUMINT LENS**

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Abstract:

The Multi-Domain Operations (MDO) concept represents a comprehensive and integrated approach to modern warfare, reflecting the need for contemporary military organizations to address the increasingly complex and interconnected nature of global security challenges. To remain effective, intelligence agencies will need to adapt to a large array of changes, adopt new technologies (while increasing their digital competencies), integrate cross-cutting dimensions, align to operational approaches, and embrace evolving ethical constraints to navigate the complexities of modern societies while maintaining their ability to collect reliable intelligence.

Additionally, the imprint of societal transformation on the future “human terrain” leads to specific challenges and opportunities in the HUMINT tradecraft. The paper identifies the intrinsic relation between the civil consideration in the operational environment analysis and the main transformational directions for the human capital in HUMINT to meet the demands of the “right people, right skills” approach in the NATO MDO philosophy.

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Key words: Multi-Domain Operations; HUMINT; skills; technology; human terrain

1. Introduction. A glimpse into the multi-domain operations

Multi-Domain Operations (MDO) is a modern military concept designed to address challenges from state and non-state actors by integrating and synchronizing actions across interconnected domains, including land, air, sea, space, and cyberspace, with a strong emphasis on emerging technologies. [1]

NATO defines MDO as the orchestration [2] of military activities, across all domains and environments, synchronized with non-military activities, enabling the Alliance to create converging effects at the speed of relevance. The philosophy of NATO's MDO concept is grounded in the recognition that future conflicts cannot be confined to a single domain - land, air, sea, cyber, or space. Instead, these conflicts will span multiple domains simultaneously and are intertwined with political, economic, and social factors, requiring a more holistic approach to warfare and synchronization of military efforts with non-military activities to achieve comprehensive effects.

MDO represents a pivotal shift in NATO's approach. This transformative concept replaces the joint operations [3] philosophy and empowers the Alliance to strategically influence events at the right time and place through military and non-military activities and



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synchronization of the efforts with external stakeholders (including partner nations, international organizations, and industry). This emphasizes the need for seamless integration of NATO's capabilities and allied countries' military systems across all domains to achieve a decisive advantage over adversaries. Given the diverse nature of national capabilities at NATO level, the focus is on interoperability and ensuring that multinational forces can work together effectively. This approach places a significant weight on standardization and training to achieve this goal.

At the operational level, NATO's MDO approach advocates for a unified, agile, and flexible force structure capable of operating effectively in any environment, across any domain. This adaptability is vital for maintaining operational momentum and exploiting opportunities in a fluid battlespace. Furthermore, achieving decision superiority is a key principle of MDO. This involves the ability to collect, process, and disseminate information faster and more accurately than the adversary, enabling NATO commanders to make informed decisions that outpace the enemy's actions. In this context, leaders' creativity (enhanced by an ability to visualize context and settings) relies on the capacity to analyze situations from different viewpoints and turn complexity into simplicity.

Interconnectivity, as an MDO principle, enhances situational awareness, decision-making, responsiveness, and shared understanding across all Instruments of Power (IoP), partners, and stakeholders, and enables warfighting interoperability between force elements. It is challenged by differences between legacy and modern platforms (e.g. lack of technical interoperability), and by data classification. It must be resilient and requires standardized data to support user requirements.

MDO enablers include advanced data analytics and intelligence systems, which provide comprehensive situational awareness and support informed decision-making. Technological advancements play a significant role, in driving the development of cutting-edge weapons, communication networks, and cyber capabilities. The principle of having the "right people with the right skills" underscores the importance of highly trained personnel who can operate effectively in this complex, multi-domain environment. Capitalizing on education and individual training, collective training exercises ensure interoperability and seamless cooperation among different military branches and allied forces. Finally, cross-domain command structures are essential for maintaining strategic oversight and directing synchronized operations across all domains. Together, these enablers form the foundation for a flexible, adaptive, and highly effective MDO strategy.

We will further investigate how the society of the future will influence the transformation of the human intelligence (HUMINT) capability to meet the performance requirements in an MDO environment and what is expected at the individual level in terms of knowledge, skills, and attitudes.

2 A multi-domain society – the future human terrain of military operations

In the MDO context, HUMINT involves, invariably, the collection and analysis of information derived from human sources, providing critical insights into adversaries' intentions, capabilities, and vulnerabilities. As HUMINT heavily relies on interpersonal skills, cultural understanding, and human networks, the future battlespace, influenced by societal changes, will transform its nature, presenting both challenges and opportunities in collection activities and



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analysis, under the pressure of technological evolution, urbanization, demographics, and communication trends.

An evolving society under the MDO scoping can be characterized by its complexity and interconnectedness across multiple domains and layers that impact social, economic, political, and technological activities. These domains, often overlapping, influence each other and shape the dynamics of society in various ways.

Physical and virtual spaces are deeply intertwined. Economic activities, social interactions, and even political processes occur simultaneously in both physical locations (e.g., cities, workplaces, institutions) and virtual environments (e.g., social media, online marketplaces, digital platforms). The boundaries between these domains are increasingly blurred as more aspects of daily life are conducted online, facilitated by digital infrastructures like cloud computing, the Internet of Things (IoT), and mobile networks.

The digital transformation of society has created a distinct cyber domain where information and data flow shape behavior, decision-making, and governance. Cybersecurity, data privacy, and the management of digital identities are critical issues. In the information domain, the flow of information, whether through traditional media, social media, or state-controlled outlets, plays a key role in influencing public opinion, economic trends, and geopolitical outcomes. Societal resilience in this domain requires strong digital literacy, critical thinking, and regulatory frameworks to prevent misinformation, cyberattacks, and digital manipulation.

Globalization has resulted in high levels of connectivity and mobility in modern societies, but also generates perspectives for a “world of disruption” [4]. People, goods, and information move quickly and across borders, linking diverse regions and cultures. Migration, international trade, and global communication networks contribute to the global nature of society, affecting its cultural diversity, economic strategies, and geopolitical positioning. This high degree of global integration also makes societies vulnerable to global crises, such as pandemics, cognitive polarization, exposure to climate change effects, or supply chain disruptions, which can impact multiple domains simultaneously.

Ecological factors like resource availability, global warming, and natural disasters increasingly influence social, economic, and political stability.[5] The intersection of climate issues with other challenges, such as migration, food security, and energy needs, demands that societies adopt holistic approaches to sustainability and resilience and integrate environmental considerations into urban planning, national security, and economic development strategies.

Ultimately, the governance of a multi-domain society requires frameworks that span across multiple sectors and areas of influence. This includes regulations on data privacy, cyber security, environmental protection, intellectual property, and global trade. Governments must coordinate with international organizations, private enterprises, and civil society to regulate these domains effectively, ensuring that societal needs are balanced with the protection of individual rights and national interests.

Norms surrounding ethics, privacy, and human rights will increasingly influence intelligence practices, including HUMINT. Growing awareness of privacy issues and human rights violations may place constraints on the methods and techniques used by intelligence agencies to collect information from human sources. Public scrutiny of intelligence operations, especially in democratic societies, may limit the ability of intelligence agencies to conduct covert operations. The demand for transparency and accountability in military and intelligence activities



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will require HUMINT operatives to balance operational effectiveness with ethical considerations, making recruitment and handling of sources more complex.

Increased global mobility and migration patterns influence HUMINT by expanding the reach of intelligence agencies beyond traditional national borders. The movement of populations, particularly refugees and migrants from conflict zones, offers new opportunities to collect intelligence from diverse human sources with firsthand knowledge of adversaries, hostile environments, or emerging threats.

However, the fluid nature of global migration also complicates HUMINT, as sources may be difficult to locate, transient, or less likely to establish long-term relationships with intelligence officers. Additionally, the transnational nature of many intelligence threats, including terrorism and organized crime, will require HUMINT officers to operate across cultural and national boundaries, necessitating a deeper understanding of the socio-political contexts in which sources operate.

Cultural values, social norms, and belief systems influence behavior and decision-making within a multi-domain society. Cognitive warfare - shaping the perceptions, beliefs, and behaviors of populations through propaganda, psychological operations, and information campaigns - becomes a more and more important factor. The digital age has amplified the relevance of the cognitive domain by allowing for widespread influence through social media and online platforms. Societal divisions, political polarization, and cultural shifts can be influenced or even exacerbated by the manipulation of information in these spaces. [6]

In the wake of cognitive warfare, the rise of digital societies and the ubiquity of online communication significantly impact HUMINT. Social media, encrypted messaging, and digital platforms are becoming integral parts of daily life, making them key arenas for intelligence operations. While the internet provides new avenues for identifying, recruiting, and communicating with human sources, it also creates challenges in terms of verifying information and steering the anonymity of online platforms. Moreover, adversaries can easily spread disinformation through these same channels, complicating efforts to obtain reliable information. [7] In addition, surveillance technologies and cybersecurity measures implemented by both state and non-state actors may make it harder to protect the identities of human sources or conduct discreet operations in the physical or digital spheres.

Social fragmentation is also fueled by ethnic, religious, or political tensions, which may create opportunities for HUMINT, as marginalized or disaffected groups could provide valuable intelligence. However, these same demographic shifts may also complicate intelligence operations, as competing narratives, misinformation, and distrust in institutions become more widespread. In many regions, generational divides could influence the willingness of individuals to cooperate with intelligence agencies. Younger generations, particularly those deeply embedded in digital and online communities, may be more resistant to traditional recruitment methods. HUMINT officers will need to adapt their approaches to account for these societal shifts, becoming experts in intersectional interactions [8].

In this context, military and defence strategies are no longer confined to traditional, physical battlefields. Cyber warfare, space-based technologies, and advanced surveillance have expanded the battlefield into new domains like cyber and space, with disruptive effects in the physical, virtual, and cognitive dimensions. Geopolitical competition is played out in these interconnected domains, with countries seeking to gain strategic advantages through technological superiority, cyber capabilities, and control over information flows.



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The war in Ukraine highlights how urbanization is making densely populated cities central to conflicts, escalating risks of civilian casualties and humanitarian crises as a result of mass displacements due to essential services disruption. Urban warfare complicates military tactics by restricting mobility, targeting, and force concentration while blurring the line between combatants and civilians. It often involves non-state actors, insurgents, or irregular forces embedded within civilian populations, making HUMINT essential for distinguishing combatants from non-combatants. However, this also increases the risk of misinformation and false reporting, as civilian populations may be coerced or influenced by adversaries. [9]

The urbanization tendency will complicate HUMINT activities, as collecting intelligence in heavily populated areas poses significant challenges. Dense populations provide cover for adversaries but also offer vast opportunities for intelligence gathering from civilians, local leaders, and social networks. Collecting reliable intelligence will require not only traditional HUMINT techniques but also deep cultural and social knowledge of urban societies.

Additionally, societal trends toward increased surveillance, often justified by concerns about security and crime prevention, affect HUMINT activities. Governments, corporations, and individuals have access to advanced surveillance technologies such as facial recognition, biometric tracking, and AI-driven monitoring tools. While these technologies may aid intelligence agencies in tracking individuals of interest, they also reduce the privacy of operatives and human sources, heightening the risk of exposure.

This heightened surveillance environment could limit traditional HUMINT operations, as adversaries and other actors may be able to detect or monitor intelligence activities more easily. Human sources, especially in authoritarian or highly monitored societies, may be less willing to engage in intelligence activities due to fear of exposure or reprisal.

Another significant aspect of the conflict evolution is the peacetime contestation actions. Being not at war, as NATO Secretary General Jens Stoltenberg reiterated in his last official visit to Norway, on September 5, 2024, there are no immediate military threats [10] against NATO countries but there is a constant danger of terrorism, cyber-attacks, and sabotage that don't make our countries safer [11]. Since the war in Ukraine began, Russia has significantly escalated its cyberattacks across Europe, targeting critical sectors (government institutions, energy grids, financial systems, and transportation networks), has engaged in sabotage operations, directed towards the military industry, storage, and transportation infrastructure, and ramped up its information warfare by spreading disinformation and conspiracy theories through state-controlled media and social media platforms, and supporting radical groups to further undermine European stability. These efforts aim to polarize European societies, fuel division, and weaken democratic institutions. Countries like France, Germany, and those in Eastern Europe have been primary targets, intending to create internal discord and reduce Europe's unified response to Russia's actions. Russian intelligence services have also been linked to covert terrorist activities, including assassination attempts not only on dissidents, defectors, and critics of the Russian government but also on important figures in military organizations and industry.

Additionally, the rise of non-state actors and asymmetric warfare is accounted as a serious threat by NATO's strategic concept [12]. Non-state actors, including terrorist groups, insurgencies, and criminal organizations, play a significant role in peacetime contestation activities, or within the threat spectrum of the future battlefield. These groups often operate in decentralized networks and employ asymmetric warfare tactics, making traditional HUMINT approaches more difficult. Recruiting sources within these groups will require sophisticated



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cultural knowledge and a nuanced understanding of local loyalties, ideologies, and motivations. The proliferation of non-state actors also means that HUMINT activities will increasingly involve cooperation with a wide array of stakeholders, including local militias, private security firms, and even non-governmental organizations (NGOs). Intelligence agencies will need to navigate these complex networks to effectively gather and analyze human intelligence.

The ongoing conflict in Ukraine has reinforced the enduring importance of kinetic warfare principles – unity of command, territorial control, force protection, range, precision, and lethality – while highlighting the transformative role of emerging technologies like artificial intelligence (AI), global communication networks and space-based assets, and autonomous systems in situational awareness, decision-making, communication and coordination, and operational agility. [13]

Future expectation is that ever-changing conditions regarding the interactions among diverse actors, adaptable strategies, multiple operational domains, advanced capabilities, societal changes and trends, and the impact of global, regional, and local factors will transpose the societal features (the “human terrain”) across the physical, cognitive, and virtual dimensions, presenting both challenges and opportunities for military forces, to include intelligence capabilities, which will need to adapt to a rapidly changing environment where traditional concepts of warfare are complemented by cyber capabilities, information operations, and the integration of emerging technologies.

To remain effective, intelligence agencies will need to adapt to these changes, adopt new technologies (while increasing their digital competencies), integrate cross-cutting elements [14], align to operational approaches, and embrace evolving ethical constraints, to navigate the complexities of modern societies while maintaining their ability to collect reliable intelligence from human sources.

3. Technological emphasis in multi-domain operations

The rapid pace of technological advancements, particularly in cyber, artificial intelligence (AI), and space environments, makes the MDO concept increasingly relevant in influencing military strategies. By integrating technologies in capability development and employing them in operations, military organizations can maintain a competitive edge over potential adversaries.

In a recent article [15], Bill Burns, Director of the US Central Intelligence Agency (CIA), and Richard Moore, Chief of the UK Secret Intelligence Service (SIS), pointed out the revolutionary impact of technology in the conflict in Ukraine, under the imperative to adapt, experiment and innovate facing a much stronger conventional enemy. As noted by the two prominent authors, this conflict represents the first one where open-source software is integrated with advanced battlefield technology, leveraging a combination of commercial and military satellite imagery, drone systems, unmanned aerial and maritime vehicles, a blend of sophisticated and rudimentary cyber warfare tactics, social media, open-source intelligence, and information operations, alongside human and signals intelligence, all at an unprecedented pace and scale.

The future battlespace will be shaped by pervasive technology, with enhanced surveillance, monitoring, and automation becoming key features in convalescing lethality, mobility, and concealment. Technological advantage is a critical enabler for the readiness and adaptability of the Military Instrument of Power (MIoP).[16] While nations advancing the MDO



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approach in their military strategies (e.g. USA [17] [18] and UK [19]) invest heavily in research and development to maintain a technological edge, with a focus on integrating cutting-edge technologies into operational planning and execution, NATO's approach is more focused on ensuring that member states can integrate and use these technologies within a collective framework, contributing effectively to MDO through interoperability and shared systems: AI-driven predictive analytics enhance situational awareness, enabling rapid response to dynamic threats; machine learning algorithms process vast amounts of data, identifying patterns and anomalies that human operators might miss; bio-human enhancements, such as wearable sensors and neural interfaces, empower soldiers with real-time health monitoring and cognitive augmentation, enhancing their performance across domains.[20]

The impact of technology can be yet more dramatic if legal, procedural, or ethical barriers are flexible. AI's involvement in social media is revolutionary not only for information operations but also for intelligence activities. With access to vast amounts of social media data, AI systems can analyze behaviors, identify and profile key influencers and human networks, craft personalized messages designed to retrieve information, and even more, manipulate opinions and decisions up to influencing larger populations (based on human predisposition toward quick, emotional decision-making [21]). Advanced AI avatars or personas can interact with social media users, mimicking human behavior and gaining trust as part of social engineering and deep fake attempts.

A critical role of AI in HUMINT is its capacity to manage vast amounts of data, alleviating the challenge of information overload. AI systems can monitor social media applications and informational platforms in real-time, flagging critical discussions, shifts in public opinion, information of intelligence interest, or security vulnerabilities. However, the complexity of AI systems introduces risks, such as the potential for misinterpretation of data, biases in algorithms, or a lack of transparency, which could lead to faulty conclusions or misguided decisions.

Anyway, as technology becomes central to warfare, adversaries may resort to low-tech, asymmetric strategies to counter these capabilities and ensure comparable assets. Both state and non-state actors will utilize advanced tools such as sensors, satellite networks, AI, and real-time data analytics for greater precision, requiring adapted countermeasures.

MDO demands a data-centric [22] approach that recognizes data as a strategic asset. In practical terms, this involves empowering people to derive maximum value from data, establishing coherent policies and processes for data exploitation, and creating a secure and governed environment for data within NATO. [23]

MDO needs a stronger digital infrastructure (“digital backbone” [24]) to link Alliance forces across various domains and command levels, as well as with non-military stakeholders. This network must ensure real-time data collection, storage, and analysis, while also enhancing NATO's collaboration with national systems and non-military expertise. Additionally, it must be flexible enough to incorporate emerging technologies that support MDO execution. Additionally, digital transformation plays a vital role in achieving this objective, allowing NATO to appreciate, share, exchange, and exploit data effectively. [25]

HUMINT can leverage NATO's digital backbone, which aims to enhance connectivity and data transport across domains. By integrating with this backbone, HUMINT can seamlessly share information across military and non-military domains, ensuring timely and relevant intelligence dissemination. By adopting standardized data formats and procedures, HUMINT can



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ensure that its insights are easily accessible and usable by other domains, enhancing overall situational awareness and operational coherence. Additionally, HUMINT must engage in continuous collaboration and information exchange with other intelligence disciplines, to enrich and corroborate its findings. This interconnected approach allows for a more comprehensive understanding of the operational environment, enabling military forces and commanders to anticipate and respond to threats more effectively.

By embedding itself within the multi-domain framework, HUMINT ensures that its valuable human-centric insights contribute to a unified and agile operational strategy.

6. Right people, right skills. Emergent requirements for the human capital in HUMINT

The NATO Warfighting Capstone Concept, endorsed in 2021, aims to guide NATO's military adaptation over the next 20 years, focusing on maintaining an advantage against adversaries [26]. Central to its implementation is the Alliance Warfare Development Agenda (WDA), which aligns NATO's warfare development activities around five key imperatives: Cognitive Superiority, Layered Resilience, Influence and Power Projection, Cross-domain Command, and Integrated Multi-Domain Defence. [27]

A crucial aspect of the WDA is the "right people with the right skills" dimension. NATO recognizes that technological advancement alone is insufficient without skilled personnel to utilize and manage these capabilities effectively. The agenda emphasizes improving workforce connectivity and ensuring that the right talents are in place to enable multi-domain operations. These skilled professionals are essential enablers, alongside data, technology, and agility, to maintain NATO's competitive edge.

The integration of HUMINT into MDO ensures that human-driven intelligence is utilized effectively to anticipate and counter complex, multi-domain threats, thereby enhancing the decision-making process and operational outcomes in a highly interconnected and dynamic battlespace.

HUMINT requires creativity in both collection methods and analytical approaches. HUMINT operators must employ innovative techniques to gather intelligence from diverse sources, including leveraging technology, social networks, and cultural understanding. Similarly, analysts must apply creative thinking and analytical skills to derive actionable insights from raw intelligence data, identifying patterns, trends, and anomalies that may not be immediately apparent.

In a multi-domain environment, military personnel must possess a diverse skill set [28], with competencies spanning the military specialty, as well as technological proficiency, cross-domain coordination, and cultural intelligence. For instance, in the realm of HUMINT collection, a professional must not only excel in traditional interpersonal skills - such as building rapport and assessing human behavior - but also be adept in digital literacy, including analyzing social media patterns, utilizing AI tools, and interpreting cyber vulnerabilities. Additionally, HUMINT professionals must develop cognitive flexibility to operate seamlessly across domains - whether in physical combat environments, cyberspace, or within psychological and information operations.

Besides cultural awareness and sensitiveness, effective training in data analysis, cybersecurity, and AI integration (as part of an enhanced digital literacy [29]) will ensure that



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HUMINT professionals are not only collecting but also correctly interpreting information from multi-layered environments. Adaptability, quick learning, and collaboration with tech specialists are critical for these roles, highlighting the growing necessity for interdisciplinary, customized teams that combine traditional military expertise with modern technological insights.

This requires rigorous and continuous training programs that are updated to reflect the latest technological advancements and emerging threats. Hands-on training with various platforms and technical devices becomes a must, and concept development and experimentation are at the spearhead of adapting emerging technologies to the evolving needs of HUMINT.

Moreover, interdisciplinary collaboration and cross-cutting training are vital to foster a comprehensive understanding of how various domains intersect and influence each other. Collective training is a vital enabler of MDO, as it ensures that forces from various branches and member nations can operate seamlessly and effectively together. Collective training must be enhanced to include scenarios that incorporate a higher level of complexity. The creation of blended live-synthetic training to generate multi-domain realism is essential to the development of an MDO-enabled force. It is also applicable to HUMINT, where modeling the "human terrain" should mirror the technical dimensions, communication patterns, and trends of modern society.

The future combat soldier will require a versatile mindset and technological literacy, seamlessly integrating technology with human capabilities. In MDO - where conflicts span land, sea, air, space, and cyberspace - situational awareness and operational agility will be paramount; it will be the result of processing vast amounts of real-time data across multiple platforms, requiring cognitive agility and the ability to make rapid decisions under pressure.

Based on current trends in research, soldiers will be equipped with enhanced body armor and smart uniforms, night vision goggles and augmented reality headsets, advanced weapon systems, and communication devices, enhancing survivability and effectiveness. Robotic technology will enhance combat capabilities, with soldiers collaborating alongside autonomous systems like drones, ground robots, and exoskeletons. This synergy will extend soldiers' operational range and allow for advanced reconnaissance, targeting, and logistical support. Wearable for HUMINT operators would also aim to improve protection, communication, human engagement support, data collection and retention, in a more discreet manner. Understanding and managing these technologies will be crucial, as soldiers would have to control, maintain, and cooperate with robotic systems in dynamic environments.

Another critical line of development for improving the soldier's capacity is represented by Bio and Human Enhancement Technologies (BHET), in the areas of Gene Editing, Bio-Engineering, Cognitive Enhancement, and Human-Machine Symbiosis [30]. Wounds care, disease prevention, performance drugs, regeneration, cognitive health and enhanced function, well-being and behavioral responses monitoring are just several dimensions supporting the soldier's physiological performance in operation, with a due application at the level of the HUMINT personnel.

4. Conclusions

MDO is a paradigm shift and a forward-looking approach to modern warfare that allows NATO to operate seamlessly across domains and environments, synchronizing military activities within multinational joint forces and integrating non-military elements (diplomatic, informational, economic instruments of power) in the continuum of conflict, from enhanced



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deterrence [31] to maintain a strategic advantage over adversaries [32]. Through MDO integration, NATO demonstrates its commitment to maintaining its strategic edge in a rapidly evolving global security environment.

The growing digitization of society (and warfare) will transform objects, individuals, and areas into entities with digital footprints, expanding conflict into virtual and augmented spaces. As a consequence, digital infrastructure, identities, and public perception become a target for cyber warfare, with significant implications for information manipulation, and intelligence collection and processing. Emerging technologies, such as AI, quantum sensors, and robotics, will reshape the battlefield and expand the scope of cyber operations, creating a more complex, densely interconnected digital battlespace.

Technological advancements are crucial in shaping MDO and enhancing military strategies. Integrating commercial and military technologies, as seen in the war in Ukraine, is key to maintaining a competitive edge. AI-driven analytics, machine learning, and bio-enhancements boost surveillance, decision-making, and soldier performance. To orchestrate the instruments of power, MDO demands a data-centric approach and robust digital infrastructure to link military and non-military stakeholders.

HUMINT's view of the future must include the integration of collection, analytical, management, and support assets with technological networks, ensuring timely and relevant performances. Starting from a projection of the future HUMINT team's profile, the supporting toolset and systems have to keep pace with the technological evolution. From this perspective, concept development and experimentation are paramount in determining the way ahead in technological investments. In any context, besides performance objectives correlated with new capabilities, adapted education and training should focus on the HUMINT professionals' digital literacy - proficiency in utilizing digital tools and platforms for information gathering, data analysis, cybersecurity awareness (including adversaries' low-tech, asymmetric strategies), and social media engagement, enhancing their effectiveness in a complex, technology-driven environment.

MDO also considers the transformation of the human dimension (sociocultural, psychological, and behavioral aspects of populations) in the future operational environment. The future human terrain of military operations is complex, being shaped by societal, technological, and environmental changes. HUMINT will face new challenges and opportunities as it adapts to urbanization, migration, and the rise of digital societies. The interconnectedness of physical and virtual domains complicates intelligence collection, as disinformation, surveillance, and societal fragmentation increase. Cognitive competencies, cultural sensitiveness, intersectional engagement skills, cross-cutting awareness, self-regulation and optimization techniques will drive the future performance of the HUMINTers engaged in continuous development programs, as part of the mindset adaptation to MDO and a comprehensive understanding of the operational environment [33].

The MDO approach in the HUMINT tradecraft will parallel top-down capability integration and organizational adaptation and interconnection, being centered on human capital enhancement, where relevant organizations – like the NATO HUMINT Centre of Excellence from Oradea, Romania – have a major stake.



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INVESTING FOR FUTURE DEFENCE-THE CASE OF BLACK SEA AREA

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Abstract:

The geopolitical importance of the Black Sea has been dramatically underestimated for years. This seems to be especially odd considering the fact that after the collapse of the Soviet Union, its littoral has witnessed 10 armed conflicts, more than any other bodies of water.

Since ancient times, the Black Sea region has been attracting the interests of the world's greatest powers, seeking extensions of their economic and geopolitical influence. The primary reason for this constant political turbulence is the geo-location of the region, which has often been described as a geopolitical crossroad between East and West. This tendency is still very much ongoing, and the interests of many of the world's superpowers continue to collide in the region.

Key words: military spending; non-military spending; economic growth; defense industry; generalized method of moments; dummy variable.

1. Introduction

The geopolitical importance of the Black Sea has been dramatically underestimated for years. This seems to be especially odd considering the fact that after the collapse of the Soviet Union, its littoral has witnessed 10 armed conflicts, more than any other bodies of water.

Since ancient times, the Black Sea region has been attracting the interests of the world's greatest powers, seeking extensions of their economic and geopolitical influence. The primary reason for this constant political turbulence is the geo-location of the region, which has often been described as a geopolitical crossroad between East and West. This tendency is still very much ongoing, and the interests of many of the world's superpowers continue to collide in the region.

However, despite being the cauldron of constant military and geopolitical tensions, the importance of the region with regard to the viability of perhaps a game-changing trade route connecting China with Europe cannot be overlooked.

The following essay will examine the characteristics of the complex region, explaining the multipolarity of the region as well as overviewing the challenges the Black Sea region faces. The essay will also shed some light on the political and economic potential the region holds, thus highlighting why it is important to invest in the defence and stability of the region.

2. Main Actors of the Region

Before analyzing the importance of investing in the stability of the region, it is vital to examine the underlying cause of its instability.



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One of the key characteristics of the Black Sea region is its multipolar nature. This multipolarity is caused by the presence of the world's largest powers within the region, as well as by the incompatible political agendas of the Black Sea states. There are 6 countries in the region; there are NATO member countries like Turkey, Romania, and Bulgaria, as well as NATO aspirant countries like Ukraine and Georgia; and then there is Russia with its aggressive revisionist aspirations. If this political mosaic was not enough, global powers like the United States and China and the European Union are actively present and engaged within the region Black Sea region, albeit to varying degrees and in different capacities.

Turkey

The importance that Turkey attaches to the Black Sea is very high. It is a crucial sea for connectivity, including for energy pipelines, and has lately become the venue for Turkey's flourishing indigenous natural gas extraction activities. This has accentuated Turkey's security-focused approach to the region and increased its motivation to hold an exclusive role. As a major regional partner controlling access to the Black Sea through the Bosphorus and Dardanelles, Turkey plays a significant role in regional security. The second-largest military power in NATO, Turkey's 775,000-strong armed forces include 1,900 tanks, 3,100 artillery systems, 850 aircraft, and ninety-two ships. The strongest power in the region outside of Russia, Turkey has an extensive Black Sea coastline stretching 1,329 km. Its \$820-billion GDP, large population of eighty-five million people and powerful military give it impressive stature and influence in the Black Sea region. Turkey spends \$16 billion, or 2.06 percent of GDP, on defense, well above the NATO average.

Russia

The Black Sea has been a critical area for Russia for centuries due to its strategic position linking Europe, Asia, and the Middle East. Control over the Black Sea provides access to key maritime routes and warm-water ports.

Russia's annexation of Crimea dramatically shifted the balance of power in the Black Sea. The peninsula hosts the strategic port of Sevastopol, home to Russia's Black Sea Fleet. This move has been widely condemned internationally but solidified Russia's military presence in the region.

Russia's military capabilities in the Black Sea region are comprehensive and strategically positioned to assert control, deter adversaries, and enable rapid response to any threats. The combination of advanced naval assets, air and missile defenses, ground forces, and electronic warfare systems creates a robust and multi-layered defense structure. This enhances Russia's strategic depth and secures its interests in this geopolitically vital area.

Bulgaria

Located in Southeast Europe, Bulgaria GDP is \$84 billion and seven million citizens, Bulgaria is challenged by a declining population, endemic corruption, poor infrastructure,

Poised between Europe, Russia, and Turkey, Bulgaria must balance these perspectives and navigate cautiously. Corruption, indirect Russian influence, and military weakness relative to its neighbors all complicate Bulgarian security planning, which is above all based on NATO's Article 5 guarantees. While the country has 378 km of Black Sea coastline, and defense spending of 1.7 percent of GDP, the Bulgarian military includes fewer than one hundred tanks and fifty combat aircraft. In February 2022, NATO pledged to field a multinational battlegroup of 1,500 soldiers in Bulgaria. As in Romania, coastal and air defenses are urgent priorities. Eighty-five percent of Bulgaria's population are ethnic Bulgarians, with about ten percent of Turkish origin.



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Romania

Infrastructure and Strategic Assets

Air Bases: Key air bases such as Mihail Kogălniceanu Air Base serve as hubs for NATO operations and deployments, providing logistical support and enhancing air defense capabilities.

Naval Bases: Constanța, Romania's principal port on the Black Sea, is a strategic naval base that supports both national and NATO naval operations. It is a key asset for maritime surveillance and defense.

Missile Defense Site: The Aegis Ashore missile defense system at Deveselu is part of NATO's ballistic missile defense architecture, providing a strategic defense capability against potential missile threats from outside the Euro-Atlantic area.

Romania has a 245-km Black Sea coastline and a GDP of \$285 billion, casts a wary eye on Russian aggression in the region, and has raised Black Sea security continuously since 2014 in NATO circles. Less than 400 km from Sevastopol, Romania is a frontline state bordering Russian air and maritime forces; its aircraft are within range of Russian air defense upon takeoff. With a current defense budget of some \$6 billion and defense spending at 2.5 percent of GDP, it has increased defense spending substantially each year since 2016, but still relies on NATO security guarantees to offset Russian aggression in the region. Claiming territorial waters out to 12 miles and an exclusive economic zone to 200 miles, Romania fields modest air and naval forces, although its army can field four hundred tanks and 1,200 artillery pieces.

Ukraine

Overview: Ukraine, the largest country entirely in Europe, has a long coastline along the Black Sea, with important ports such as Odessa and Sevastopol. The country has a diverse cultural heritage and has faced significant geopolitical challenges, particularly with the annexation of Crimea by Russia in 2014.

Defense Capabilities: Ukraine's navy has been significantly impacted by the annexation of Crimea, but it has focused on rebuilding and modernizing its fleet. Coastal defense systems, missile boats, and anti-ship missiles are key components of Ukraine's maritime strategy.

Georgia

Like that of others in the region, Georgia's security is inextricably bound to the threat from neighboring Russia. To prevent Georgia's closer integration with the West following the 2003 Rose Revolution and 2008 Bucharest Summit declaration that Georgia and Ukraine would eventually become members of NATO, Russian forces invaded in the fall of 2008 and continue to occupy 20 percent of Georgia's landmass in the regions of Abkhazia and South Ossetia, depriving Georgia of two-thirds of its Black Sea coastline.

Russia and the Russian-occupied Republic of Abkhazia announced an agreement on October 5 that allows Russia to establish a long-term naval facility in the Black Sea coast district of Ochamchire. The location is likely to be used to house Russia's Black Sea fleet that has been displaced. On October 23, Ukrainian intelligence revealed that Russia had started dredging the area in preparation for building a sizable naval station. Following the collapse of the Soviet Union, Abkhazia, an officially recognized part of Georgia, broke away from Tbilisi in a conflict and has been governed by separatist authorities backed by Russia ever since. A situation of de facto Russian occupation has resulted from Moscow's gradual military, political, and economic integration of the region.



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As it was already highlighted in the introduction the region often attracted the interests of global powers. This is largely due to its geostrategic location.

While in the past the region was not a top-tier issue for the United States, Russia's ongoing aggression against Ukraine has definitely changed this. President Biden's administration acknowledges the importance of the region for transatlantic security, which was clearly elaborated by drafting the Black Sea strategy. The document outlines five pillars of the strategy, which are: increased bilateral and multilateral engagement; regional security cooperation, buttressed by an enhanced NATO presence; economic cooperation; energy security; and democratic resilience. In short, USA's interests lie in keeping the Black Sea free and open, serving as a buffer from harmful influences stemming from Russia, Iran, and China. As Mara Karlin, assistant secretary of defense for strategy, plans, and capabilities, highlighted, *“The United States will continue to work with NATO allies to advance military modernization to address Russia's military threat, including through enhanced posture and exercises to improve security and prosperity for the region”*.

Yet another important actor increasingly involved in the many dimensions of Black Sea politics is the European Union. The region is important for the Union, partially due to eastern and central European member countries' security concerns as well as due to the rising importance of trade, transport, and energy routes linking Asia with Europe. The EU's strategy for the Black Sea was structured in particular by the "Black Sea Synergy - A New Regional Cooperation Initiative". However, Russia's ongoing aggression against another black sea state has drastically changed the security environment of the region. An unstable Black Sea region directly threatens the peace and prosperity of the European Union, as well as international trade and commerce and global food security.

The increased presence of China in the Black Sea region is a relatively recent development. While clearly prioritizing other areas of its foreign policy, as a part of its Road and Belt initiative, China increased its economic and diplomatic presence in the region. As part of its policy, China focuses on regional infrastructure projects as well as emerging middle corridor initiatives, which might be a game changer not only for regional countries but for the EU as well. It is also noteworthy that last year Beijing lifted its economic embargo on Lithuania, a key sticking point in China-EU relations. While striving for more regional influence and a stable black sea, China is expected to increase its presence in the region, play an active role in rebuilding Ukraine, and further develop its strategic partnership with Georgia. While other global powers also continue their presence in the region, it is safe to predict that the region will be a stage where global power competition will take place.

2.Challenges of the Black Sea region

The Being located at the crossroads of the European, Eurasian, and Middle Eastern security areas, the Black Sea region has historically been a place of great power competition.

Although during the Cold War, the Black Sea was relatively calm (in large part due to the ordering principal Montreux Convention), the situation was drastically challenged after the dissolution of the Soviet Union. For the past 3 decades, The Black Sea has become the world's bloodiest water, having witnessed 10 military conflicts, including Russia's ongoing aggression against Ukraine. As a result of these developments, a broad range of political, maritime, economic, and energy security issues have emerged.



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The Black Sea region represented a focal point of Russian political and military policies for a long time. Through the lens of Russian revisionist policy control over the Black Sea is essential to maintaining an Eurasian “sphere of influence” as well as access to other geographic areas of importance like the eastern Mediterranean, the Middle East, and Africa. This was further evidenced by its military conflicts against other regional countries like Georgia and Ukraine and its continuous efforts to modernize the Black Sea Fleet.

Russia’s revisionist policy and blatant disregard for international legal order, clearly illustrated by its ongoing aggression against Ukraine, and illegal occupation of territories of Georgia remain one of the many security challenges undermining not only the regional stability but the rules based global order.

Hybrid threats and challenges in the region present a complex landscape with various tools utilized for what the UK terms “political warfare.” This form of warfare aims to undermine cohesion and social resilience, often by leveraging deniable means such as propaganda, fake news, cyberspace manipulation, subversion, proxy forces, and sabotage.

Internal fractures and divergences, coupled with external actors exploiting divisions, further complicate the regional landscape. As Europe contemplates deepening ties with China, questions arise about the implications of such reliance.

In essence, while the Black Sea region navigates through significant changes and potential opportunities, the persistence of war as a foreign policy instrument and the presence of internal fractures underscore the challenges that must be addressed to achieve stability and progress.

Even though the Black Sea Region faces some serious and urgent geopolitical challenges potentially leading to increased divergence in political structures and societal dynamics, however, these changes also present opportunities for connectivity and infrastructure development.

The Black Sea region has the potential to greatly contribute to the process of diversifying the EU’s energy supplies. Interest in expanding the Southern Gas Corridor pipeline network through which Azerbaijan exports gas to Europe has surged since the Russian invasion of Ukraine and the curtailment of Russian gas exports to Europe. In July 2022, the European Commission and Azerbaijan signed an agreement under which Baku would look to double exports to Europe to 20 Bcm/year by 2027. However, Further expansion of the corridor to reach the undertaken pledge requires significant investment, which has yet to be agreed upon between stakeholders.

Yet another important initiative in the Black Sea Region contributing to the EU’s energy security efforts is the Black Sea Electricity Project. The agreement signed by the leaders of Azerbaijan, Georgia, Hungary, and Romania envisages building underwater electric cable under the Black Sea and creating a 1,100-kilometer length corridor for green energy.

Energy security is not the only area where the Black Sea Region might play a potentially transformative role in the near future. The Trans-Caspian International Transport Route (TITR), known as the Middle Corridor aims, to link Central Asia, the Caucasus, Turkey, and Eastern Europe. Following the routes of the ancient Silk Road, the Middle Corridor trade route can be considered as a viable strategic alternative to both: the Northern Corridor and Red Sea trade routes.

Despite having opportunities for transit corridors and economic development, concerns linger, particularly regarding the continued war in the region, political instability, autocracies,



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underdeveloped infrastructure, and transfer services. These factors further complicate the regional landscape and hold back the full realization of its economic and geopolitical potential.

Russia's aggression against Ukraine and the involvement of great powers in the region have created new geopolitical realities around the area. While the region's importance with regards to different political, maritime, economic, and energy security issues is undeniable, it also creates a strong case for investing in its security.

Many have argued that in fact what is at stake right now is not only the sovereignty and territorial integrity of Ukraine but the whole rules-based international order, therefore by providing necessary military assistance to Ukraine, along with the support of longer-term reconstruction and reconciliation efforts is an investment in upholding the Western values system. It is only through the liberation of the temporarily occupied by Russian Federation territories and the provision of freedom of navigation we can restore regional as well as global security.

Yet another way of contributing to the security and defense of the Black Sea regional countries is an investment in the region's geopolitical and economic potential, since the more economically independent, and more connected the Black Sea region becomes, the more it will be able to protect itself against destabilizing and threatening forces.

Several steps should be taken for the full realization of the transshipment potential of Middle Corridor seeking to play an important role between the growing economies of Central Asia/South Caucasus and EU and Mediterranean markets, namely:

- To engage as many countries as possible in trade and transit via the Middle Corridor;
- To make necessary investments to improve railway logistics, port and rail connectivity in Georgia, Turkey, as well as in Romania and Bulgaria;
- To improve and digitalize customs and border management.

Investing in energy corridors like the Southern Gas Corridor and the Black Sea Electricity Project also might be key for a more stable and interconnected region. Therefore increased regional cooperation and investment in energy infrastructure can be considered as investments for the secure region.

At the same time littoral states especially the ones outside of NATO, should consider investing in naval defense and air defense systems, as well as on strengthening military and civil defence capabilities to be able to create at least a basic level of deterrence against Russia's hybrid and military efforts.

3. Conclusion

The Black Sea region as a strategic location, serving as a bridge between East and West, has historically been a point of great power rivalry. The dissolution of the Soviet Union and subsequent regional conflicts have only intensified this dynamic. Today, the region's geopolitical landscape is characterized by the involvement of many regional and global powers, each with its own strategic interests.

The security landscape of the Black Sea is fraught with challenges. Russia's ongoing aggression against Ukraine and its revisionist policies undermine not just regional stability but broader Euro-Atlantic security. The use of hybrid warfare tactics, internal political fractures, and



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external manipulations further complicate the security environment of the region, making it essential for regional states and their allies to develop robust strategies to counter these threats.

Despite these challenges, the Black Sea region holds substantial potential. Its strategic location makes it a critical hub for energy and trade routes. Full realization of initiatives like the Southern Gas Corridor, the Black Sea Electricity project, the Middle Corridor initiative might be considered as a way of mitigating the challenges of the region since it's a great chance that by enhancing these initiatives and engaging in them as many countries as possible the pressure for peace most likely to balance potential threats.

The economic and geopolitical potential of the Black Sea region is vast, but its realization requires significant investment and political will. Addressing the ongoing conflicts, political instability, and underdeveloped infrastructure is paramount. International cooperation, particularly through multilateral frameworks and alliances such as NATO and the EU, is crucial for fostering stability and development in the region. Moreover, promoting democratic resilience and economic cooperation can create a more favorable environment for investment and growth.

Investing in the stability and development of the Black Sea region is not only a step taken for more stable region but also for a more stable and secure global order.

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**BUDGETING PROCESS WITHIN PPBES AND ITS
CORRELATION WITH FINANCIAL MANAGEMENT**

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Abstract:

The PPBE process is the primary Resource Allocation Process (RAP) of DoD. It is an annual cyclical process to determine Department funding requirements and to allocate resources to satisfy those requirements. It is one of three major decision support systems for defense acquisition along with Joint Capabilities Integration and Development System (JCIDS) and the Defense Acquisition System. It is a formal, systematic structure for making decisions on policy, strategy, and the development of forces and capabilities to accomplish anticipated missions. PPBE is currently an annual process, which requires the Military Departments and Defense Agencies to submit a program request (known as the Program Objectives Memorandum (POM)) covering a five fiscal year period and a budget request (known as the Budget Estimate Submission (BES)) that addresses the first fiscal year of the five year Program Objectives Memorandum POM submission.

Key words: PPBE; process; strategy; budgeting .

1.Introduction

The Planning, Programming, Budgeting, and Execution System (PPBES) serves as a foundation for allocating resources within the expansive structure of the Department of Defense (DoD). Positioned at the convergence of planning, programming, budgeting, and execution, this intricate system plays a pivotal role in coordinating resources to precisely achieve strategic goals. Within the intricate fabric of PPBES, this article aims to concentrate on the intricate domain of the budgeting procedure, uncovering the mutually beneficial connection it shares with financial administration. In this examination, we delve into the essence of the topic, gathering insights from authoritative references to illuminate the inherent relationship within PPBES, emphasizing its intricate correlation with financial management methodologies. Through this perspective, we explore the multifaceted terrain of defense resource allocation, elucidating the synergies that underscore its effectiveness and resilience.

5. PPBES and the correlation with financial management

The In the context of PPBES (Planning, Programming, Budgeting, and Execution System), a framework refers to the structured approach or set of principles that guides the entire process. This framework outlines the steps and procedures involved in planning, programming, budgeting, and executing resources within an organization or government agency. It provides a systematic method for decision-making, resource allocation, and performance evaluation to ensure alignment with organizational goals and objectives. The framework typically includes



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guidelines for assessing priorities, estimating resource requirements, allocating budgets, and monitoring progress towards achieving desired outcomes.

In the PPBES (Planning, Programming, Budgeting, and Execution System), the planning phase is the initial stage where organizations or government agencies identify their strategic goals, objectives, and priorities. During this phase, decision-makers assess current and future needs, analyze potential challenges and opportunities, and develop strategies to achieve desired outcomes.

Key activities in the planning phase of PPBES include:

1. Strategic Planning: Defining the organization's long-term vision, mission, and overarching goals.
2. Assessment of Requirements: Evaluating the resources needed to accomplish strategic objectives, including personnel, equipment, facilities, and funding.
3. Analysis of Alternatives: Considering different courses of action and evaluating their potential impacts on achieving organizational goals.
4. Risk Assessment: Identifying potential risks and uncertainties that may affect the successful implementation of plans and strategies.
5. Stakeholder Engagement: Involving relevant stakeholders subject matter experts, and the public to gather input and ensure alignment with broader objectives.
6. Documentation.

In the PPBES (Planning, Programming, Budgeting, and Execution System), the planning phase initiates the strategic process by defining organizational objectives, assessing current and future needs, and formulating strategies to achieve goals. It involves strategic planning, resource assessment, risk analysis, and stakeholder engagement. Decision-makers establish long-term visions, mission statements, and overarching goals, ensuring alignment with organizational priorities. Through meticulous documentation, assumptions, and methodologies, the planning phase sets a clear foundation for subsequent phases. It enables informed decision-making, resource allocation, and performance evaluation, driving effective implementation of programs and initiatives within the organization.

In the PPBES (Planning, Programming, Budgeting, and Execution System), the budgeting phase translates programmatic plans into financial allocations. It involves the formulation, justification, and execution of budgets to support the identified programs and activities. Decision-makers allocate resources based on prioritized programs, cost estimates, and performance measures established in earlier phases. This phase includes the preparation of budget requests, negotiations, and approval processes. It aims to ensure that available resources are efficiently allocated to meet organizational objectives while adhering to fiscal constraints. The budgeting phase is crucial for financial planning, accountability, and aligning resources with strategic priorities within the organization.

The Execution phase in PPBES (Planning, Programming, Budgeting, and Execution System) is the implementation stage where allocated resources are utilized to carry out planned programs and activities. It involves operationalizing strategies, monitoring progress, and managing resources effectively. Decision-makers oversee the execution of budgets, ensuring adherence to approved plans and performance targets. This phase encompasses project management, procurement, and operational activities to achieve desired outcomes. Continuous monitoring and evaluation are key to assessing performance, identifying deviations, and making



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necessary adjustments to optimize resource utilization. The Execution phase is critical for translating plans into tangible actions and driving organizational success.

The Planning, Programming, Budgeting, and Execution System (PPBES) within the United States Department of Defense (DoD) is intricately linked with sound financial management practices.

This segment explores the profound interrelation between the budgeting process within the PPBES and financial management, highlighting essential facets including resource alignment, fiscal accountability, performance evaluation, and the critical necessity for adaptability.

Strategic Alignment of Resources in PPBES ensures that allocated resources are synchronized with organizational objectives and priorities. It involves aligning budget allocations, personnel, and other resources with strategic goals identified during the planning phase. Decision-makers prioritize programs and initiatives based on their strategic significance, allocating resources accordingly. This process facilitates the efficient utilization of resources to achieve desired outcomes and maximize organizational effectiveness. Regular reviews and adjustments ensure that resource allocation remains aligned with evolving strategic needs. Strategic Alignment of Resources is essential for optimizing performance, enhancing accountability, and driving overall success within the organization.

The Integration of Financial and Programmatic Perspectives in PPBES harmonizes budgetary considerations with programmatic goals. It entails aligning financial resources with program priorities identified during planning and programming phases. Decision-makers ensure that budget allocations reflect the strategic importance of programs and their anticipated outcomes. This integration facilitates informed decision-making, allowing for resource allocation that maximizes program effectiveness within fiscal constraints. Regular assessments ensure financial resources are optimally utilized to achieve programmatic objectives. By bridging financial and programmatic perspectives, PPBES enhances transparency, accountability, and the overall efficiency of resource allocation processes within organizations.

Upholding Fiscal Responsibility in PPBES entails judicious management of financial resources to align expenditures with organizational goals. Decision-makers prioritize programs strategically, monitor spending rigorously, and adhere to budgetary limits. Through transparent reporting and regular audits, fiscal integrity is maintained, ensuring accountability and trust. This commitment to responsible fiscal management safeguards the organization's financial health and enables the effective achievement of objectives within allocated resources.

Efficient Resource Utilization in PPBES optimizes the allocation of resources to maximize program effectiveness. Decision-makers prioritize programs based on strategic goals, ensuring resources are allocated where they can have the most significant impact. Through careful monitoring and evaluation, wastage is minimized, and resources are directed towards activities that deliver the highest returns. This focus on efficiency enhances organizational performance and ensures that resources are used judiciously to achieve desired outcomes.

Ongoing Performance Monitoring in PPBES involves continuous evaluation of program effectiveness and resource utilization. Decision-makers track progress against established goals, using performance metrics to identify successes and areas for improvement. This iterative process enables timely adjustments to resource allocations and program strategies, ensuring alignment with organizational objectives. By maintaining vigilance over performance, PPBES fosters accountability and facilitates data-driven decision-making, ultimately enhancing the organization's ability to achieve its mission effectively.



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Financial managers do not simply maintain the status quo; they take on a proactive role, especially when confronted with changing circumstances. As programs advance through the execution phase, unexpected events or shifts in priorities may require budget adjustments. Financial managers, working in tandem with program managers, offer suggestions for modifications to ensure that resources remain flexible and in line with organizational objectives even in dynamic environments.

The Flexibility and Iterative Nature of Financial Management in PPBES allows for dynamic responses to evolving priorities and conditions. Decision-makers can adjust resource allocations and budgetary plans iteratively based on changing needs and feedback. This approach ensures that financial resources are used efficiently and effectively to support organizational goals. By embracing flexibility, PPBES enables agility in financial decision-making, fostering adaptability and resilience in the face of uncertainty.

3.Conclusion

The Planning, Programming, Budgeting, and Execution System (PPBES) serves as a comprehensive framework within the Department of Defense (DoD) for strategic resource allocation. It facilitates the coordination of resources to achieve organizational goals, with a particular focus on budgeting and financial management. Through its various phases, including planning, programming, budgeting, and execution, PPBES ensures alignment with strategic objectives, efficient resource utilization, and ongoing performance monitoring. The correlation with financial management underscores the importance of fiscal responsibility, strategic alignment of resources, and adaptability to changing circumstances. Overall, PPBES integrates financial and programmatic perspectives to enhance transparency, accountability, and effectiveness in resource allocation within the DoD.

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LESSONS IDENTIFIED FROM THE WAR (CONFLICT) IN UKRAINE

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Abstract:

This paper identifies key lessons from the international response to the conflict in Ukraine, emphasizing shifts in diplomacy, the strategic use of economic sanctions, and the significance of sustained military aid. Initially, global diplomatic attitudes were sceptical about severe measures. However, the resilience and determination of the Ukrainian people and their leadership catalysed a rapid change in international positions. Economic sanctions have demonstrated both immediate impacts and long-term potential to harm the Russian economy, underscoring the power of coordinated financial measures. Furthermore, the unprecedented military and humanitarian support for Ukraine illustrates the critical importance of sustained international commitment to counter aggression and highlights the need for a unified global response to uphold democratic values and international law.

Key words: International response; Diplomatic shifts; Economic sanctions; military aid; Ukrainian resilience; financial measures; International commitment; global response; Democratic value; International law; Counter aggression

1.Introduction

The conflict in Ukraine has emerged as a pivotal event in modern geopolitics, drawing significant international attention and response. This paper seeks to identify the key lessons derived from this conflict, particularly focusing on the evolution of international diplomatic stances, the implementation and efficacy of economic sanctions, and the critical role of sustained military aid. Initially, the global diplomatic community was hesitant to impose severe measures against Russia. However, the resilience and determination of the Ukrainian people, alongside the strategic leadership, prompted a rapid and decisive shift in international positions.

The use of hybrid warfare tactics by Russia, encompassing cyber warfare and information operations, challenged traditional military strategies and highlighted the evolving nature of modern conflicts. Economic sanctions, aimed at crippling the Russian economy, demonstrated both immediate impacts and potential long-term consequences. Meanwhile, unprecedented levels of military and humanitarian aid to Ukraine underscored the necessity of a unified global response to counter aggression and uphold democratic values and international law.

By examining these aspects, this paper aims to provide a comprehensive understanding of the international response to the Ukraine conflict and the strategic lessons that can be applied to future geopolitical crises.

2.International Response

The positions of the international community regarding Russia's waging of a full-scale war against Ukraine were in all respects radically different from the attitudes existing before the start of the war and in the first days of the war. This categorical change in positions was caused



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by many factors, but the first and foremost in this case is the dedication and self-sacrifice of the Ukrainian people and the Armed Forces of Ukraine. Of course, Ukrainian President Volodymyr Zelensky and his highly competent team work very effectively on shaping international opinion and decisions.

Let's follow in order. For example, before the start of the war and in the first days of the war, the attitude of diplomats, politicians and experts regarding “the disconnection of SWIFT from the Russian international settlement system”¹ was quite sceptical, and “the shutdown of the Nord Stream 2 gas pipeline”² was also considered unlikely. Regarding the latter, the basis for the formation of such an attitude was provided by the voiced position of the German government itself. German Chancellor Olaf Scholz and individual members of his coalition cabinet were very cautious about blocking the Russian gas pipeline in the context of the outbreak of war. Their position regarding “arms sales to Ukraine”³ was even tougher. The German authorities were categorically opposed to the sale of arms to Ukraine by NATO member states, especially those made from German parts.

In private conversations, the introduction of sanctions against Putin was practically excluded. In all these cases, we saw what happened in just a few days, although before that, based on the intelligence services of NATO member states, information was spread that “Kiev would be in the hands of Russia in 96 hours.”⁴ The leaders of the international partners later openly confirmed that they were “offering the Ukrainian president, his family and members of his team to evacuate and leave the country in time.”⁵ If there were no doubts about the certainty of the fall of Kiev, it is also confirmed by the fact that practically all countries evacuated their embassies in Western Ukraine before the start of the war, and some within a few days after the start of the war. Some member states of NATO, together with diplomats, also withdrew from the country military instructors who had been in Ukraine for years and, especially, recently helped Ukrainians to acquire new defensive weapons. In the first hours of the war, their boisterous speeches, sarcasm and confidence were slowly replaced by confusion, and also by frustration caused by failure and the severity of sanctions.

To sum it up, everyone expected the world's largest and most "powerful" Second Army blitzkrieg across Ukraine and a quick end to the war by overthrowing the legitimate government and installing a puppet one in Kiev. All but the Ukrainian people, the armed forces and their leader. No matter how the processes develop and end, “93% of Ukrainian citizens are sure that they will end with their victory.”⁶

Also, Ukraine showed the world that:

After the annexation of Crimea in 2014 and the start of hostilities in Eastern Ukraine, the armed forces of Ukraine were created practically from scratch, despite the significant numerical superiority of the opponent, they did not allow the enemy to occupy the capital; In the information campaign, Ukraine really defeated and shattered both the existing myths about the "invincibility" of the Russian armed forces and the all-powerful Russian propaganda machine;

The unity of state-minded political forces, in the conditions of the danger facing the country, played a very serious role in strengthening the nation's resilience and, ultimately, in the successful fight against Russian aggression;

All this convinced the world that this is not a war either for Donbas, or for Ukraine, or for stopping Ukraine from joining NATO, but it is a war against the civilized world, the liberal democratic order, the main values and values.



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A combination of the above factors, together with a very successful aggressive/proactive diplomacy, played a decisive role in changing the positions of the international community. These changes affected both political positions and practical decisions regarding military and other types of aid. Obviously, the brutality of the crimes committed against the Ukrainian people and humanity by Vladimir Putin and his regime, especially the killing of civilians (children, women, the elderly), the destruction of non-military infrastructure (schools, kindergartens, maternity hospitals, hospitals, theatres and shopping facilities) leaves no moral choice.

Putin left no other option for the West, except for the introduction of unprecedented sanctions, the supply of modern weapons and the decision to isolate Russia practically 100%. It all started with the closure of the airspace for Russian civil aircraft, continued with the requisition of 90% of the aircraft fleet leased to Russia.

The exit of the largest oil and gas extraction companies, the export of their technologies, actually ensured the paralysis of the oil extraction process by Russia. The exit of transnational car manufacturers, in addition to actually putting Russian car owners in front of everyday problems, also caused significant damage to the Russian armament assembly process. In this regard, the introduction of sanctions against Russia by South Korea and Taiwan, which left Russian technology in space, in the air, at sea or on land without chips, was also of great importance.

The decisions of the President of the United States of America and his administration were very important, both regarding the unprecedented military aid and the most important financial and economic decisions taken against Russia. The USA, along with Great Britain and Canada, and later the European Union practically unanimously and simultaneously made a decision to practically completely disconnect the Russian banking system from the "SWIFT system,"⁷ a significant part of Russia's foreign exchange reserves, the leading Russian banks, the largest companies, Putin's immediate entourage and on „the freezing of assets and accounts of Russian oligarchs.”⁸ We are talking about hundreds of billions of dollars, as well as billions of dollars worth of property owned by both corporations and individuals. The decision to ban the purchase of Russian oil was also unprecedented. This “sanction”⁹ was subsequently joined by a significant part of the EU member states, although it was very difficult to reach unanimity on this issue.

From the very first hours of the beginning of the war, the Prime Minister of Great Britain and his cabinet acted as the global democratic leader, directing efforts to stop Russian aggression, punish Putin's regime, and support Ukraine's freedom struggle. The supply of British-American anti-tank weapons played a decisive role in the destruction of hundreds of Russian tanks and armored vehicles and combat vehicles. He is also responsible for the collapse of "Londongrad", i.e., the largest center of Russian financial capital, which has been created in the capital of Great Britain for years. Poland's role in dealing with Russian aggression is very important. Polish leadership is at the head of all large-scale initiatives, military and financial support. Due to the activity of both the president and the prime minister, it was possible to supply almost all weapons and ammunition to Ukraine through the territory of Poland. Poland makes a big contribution to sheltering 1.5 million Ukrainians. Also, the role of Poland was important for Ukraine in starting the discussion on the issue of EU candidate status in an accelerated manner.

The Baltic countries also play an important role. They did their best to get ammunition and weapons to Ukraine on time; They did everything to cause maximum damage to Russia. One



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of the most important was their decision not to allow Russian ships into the ports of the Baltic states. Also, the parliaments of three countries activated the issue of "closing the sky" of Ukraine. I believe that it was the activity of Great Britain, Poland, and the Baltic states that led to the fact that in exchange for the introduction of a no-fly zone, as well as the delivery of combat aircraft at the first stage, the Alliance made a decision to supply air defense systems to Ukraine.

"Speech in the Bundestag"¹⁰ of the German Chancellor was very important to support of Ukraine. Since then, no one has mentioned "Northern Stream 2" and the issue of arms delivery/non-delivery for a long time. Moreover, based on various information, German veterans are fighting side by side with American, Canadian, British, Polish, Georgian and other European volunteers. As for the pipeline, there have been growing calls to „stop the Nord Stream 1 project.“¹¹ Both Germany and other EU member states and the EU itself as a whole have taken active measures and decisions to reduce dependence on Russian energy carriers. The European Commission decided that gas storage facilities of various sizes, which are used to supply gas to the member states, should be built as soon as possible.

Although there is a widespread opinion that sanctions are not effective enough to stop the war, it is safe to say that in the medium and long term, the combination of these sanctions will have devastating consequences for Russia. At the first stage, Turkey's role in supporting Ukraine from the NATO member states should be especially noted. Although Turkey did not join the sanctions, it closed the Bosphorus Strait to Russian warships; Unmanned aerial vehicles of the "Bayraktar" company were continuously supplied to Ukraine. which at that time played a decisive role in repelling Russian military convoys. At the same time, the Turkish president, as a mediator, took a number of steps to stop Russia's aggression.

The actions of the Putin regime resulted in both Switzerland and Sweden providing effective aid to Ukraine after 200 years of neutrality. Switzerland has expressed readiness to disclose the identity of owners of Russian assets in Swiss banks. Also, Sweden and Finland supplied ammunition to Ukraine. At that time, the French president was conducting intensive negotiations with both Vladimir Putin and Volodymyr Zelensky. In addition, France has frozen 22 billion euros of Russian state assets and 850 million euros of business and private individuals' finances and assets.

Japan's principled position is extremely important. He had his own problematic issues with Russia regarding the Kuril Islands and was always very careful about positioning himself with Russia, but the situation changed dramatically after Russia's large-scale attack on Ukraine. Japan joined international sanctions, including Russia's withdrawal from SWIFT, self-imposed sanctions that resulted in the freezing of an additional \$115 billion in Russian foreign exchange reserves; All major Japanese companies withdrew from the Russian market and closed their factories there. In response, Russia "withdrew from the post-World War II negotiations format"¹² with Japan.

China's position is also significant, although China has supported Russia in opposing NATO's eastward expansion, it remains committed to respecting Ukraine's territorial integrity and sovereignty, expressing concern over crimes against civilians in Ukraine and, most importantly, refusing to supply arms to Russia. In addition, Chinese companies are well aware that falling under international sanctions can seriously harm them. Therefore, they refrain from dealing with Russia in a number of directions, and Chinese financial structures refuse to carry out transactions with Russian banks under sanctions. Above situation was in the first days, weeks, and months after the invasion, when it was critically important to get help for Ukraine to



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properly resist Russian aggression. After that, with a few exceptions, to this day, there has not been a European country that has not provided the greatest assistance to Ukraine.

At the beginning of 2024, the European Union unanimously approved the aid package of €50 billion as part of the Ukraine Facility.¹³ Also critically important for Ukraine is the "US\$61 billion military aid package approved by Congress."¹⁴ Although aid to Ukraine continued over those two years, the quantity and timing of supplies were often delayed and insufficient to meet Kyiv's needs, particularly for major combat equipment such as tanks, long-range weapons, and the still-undelivered F-16s.

And yet, overall, Ukraine has an unprecedented support effort worth around 100 billion Euro from 31 donor countries and 5.6 billion Euro allocated by EU institutions, from February 2022 to January 2024.¹⁵ Ukraine also was provided humanitarian aid and financial support for the connection of Ukraine's energy infrastructure with the European Union's electrical network, the tax-free import of Ukrainian goods to the Union, etc.¹⁶

Without such military and economic support, Ukraine would not have been able to protect more than 80 percent of its territory against a Russian invasion. However, this aid comes with restrictions on the use of arms. In particular, Washington and its major allies placed limitations on significant Ukrainian operations in Russian territory,¹⁷ despite their potential operational value in weakening Russia's war effort. Additionally, they avoided or postponed certain supplies to prevent an escalation between Moscow and NATO. On the other hand, the Kremlin received military aid from North Korea and Iran¹⁸ without significant constraints on its strategy against Ukraine. Meanwhile, China's role has so far been limited to a political, energy, and economic partnership with Russia, falling short of providing defence equipment.

Disengagement by the US and/or Europe from this war would deliver a tremendous blow to Kyiv's military capacity to defend its people and territory and likely lead to a Russian strategic victory in the mid-to-long term. Conversely, a stable, robust, long-term commitment to supplying Ukraine's armed forces is essential for any consideration of the best Ukrainian strategy, given the two years of invasion and the ongoing stalemate on the ground.

3. Hybrid Warfare in the Russia-Ukraine War

Hybrid threats and methods are not inherently new. Covert operations, psychological and information operations, sabotage and support of proxy groups have been a permanent part of the history of human wars. The use of cyber means and modern high technologies is also a natural stage in the evolution of war. The wars of any generation were greatly influenced by the innovations accompanying the development of humanity. In this regard, nothing new is happening today.

The current Russia-Ukraine war is in the center of world attention, both due to the importance of the potential consequences of the conflict, as well as from a general information point of view. However, it is very important to touch on one topic that deserves attention and the necessity of its military theoretical and practical understanding is on the agenda, this is the impact of the hybrid warfare factor on this conflict. The importance of hybrid warfare, exaggerated ideas about it, prevailing media emphasis over the years became an important factor, due to which the Russian military thought was too concentrated on using the methods that had already become "traditional" for it as a general plan. "Hybrid warfare essentially refers to the use of unconventional methods of warfare clubbed with the traditional means of military actions. It



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includes means like economic coercion, disinformation and propaganda, use of proxies, cyber warfare, etc.”¹⁹

Against the background of the events known to everyone before the start of the war, the concentration and gathering of Russian troops around Ukraine raised certain questions - how much was possible even by a group of 200,000, under the conditions of approximately the same number of armed forces of Ukraine, partial or total occupation of the country. Accordingly, the realization of the military-political goals set for Moscow by conventional methods seemed to be an incredible adventure. Considering these factors, for the majority of observers, the decision to start the war turned out to be absolutely unexpected, since, according to purely military logic, under the conditions of such a balance of forces, the attacking side was actually doomed to failure.

However, it seems that in the last 10 years, the Russian military-political leadership, fascinated by the results of the Russian hybrid war, was imbued with completely different expectations. For any war plan, its military theoretical component is an important component it is on this that the highest military-political leadership should take the idea, if you want a war plan for the future conflict. For the military-theoretical understanding of the Russia-Ukraine war, it is necessary to think about the alleged harmful effects of the so-called the success of the "Russian hybrid war" affected the Kremlin itself and the Russian military-political leadership. In order to clearly understand what we are dealing with, let us once again explain the essence of war, its connection with politics and hybrid war.

According to the famous Prussian military theorist Clausewitz, “war has three actors, all three are equally important when discussing war, and neglecting any of them leads any theory to a dead end. Thus, the triad government-army-people is the axis on which the theory of war is based.”²⁰ Of these, the government politically conducts the war, the people are the substrate of internal hatred, and the army, on behalf of these people, fights for the realization of political goals. “War aims to realize one's will through violent confrontation. The strategy involves putting the opponent in such a difficult situation that they prefer to concede, increasing their motivation to surrender and If morality is ignored, any method to achieve this becomes acceptable.”²¹

Following the annexation of Crimea and the well-known events in Ukraine in 2014, many foreign researchers attempted to find the origins of Russia's "new" strategy or tactics during these events, which led them to the article "The Importance of Science in the Future for foreseeing" published in February 2013 by Russia's Chief of General Staff, Valery Gerasimov.²² Although the phrase "hybrid warfare" is not used in the paper, Gerasimov was later viewed as an ideologue of Russian hybrid warfare based on the opinions presented in it.

In the article, the author emphasizes “the importance of non-military means, the role of informational and psychological operations in modern conflicts. Focuses on the declining importance of traditional military means in achieving the political objectives of war.”²³ Emphasizes the role of non-military methods for the realization of strategic tasks, which are “aimed at shaking the foundations of the state, so that it is not necessary to use military means to defeat the opponent. According to Gerasimov, the front line in such wars is very conditional and can be passed in all spaces at the same time.”²⁴ Gerasimov's vision is based on the idea that the mind is the main target of modern warfare, and therefore information and psychological warfare dominate modern military operations.



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We can boldly say that the essence of the Clausewitzian war with Gerasimov, of course, does not change, the goal is to break the opponent's will, but with other non-traditional methods. It seems that before the start of the Russia-Ukraine war, the strategic plan of the Russian military machine was based on these visions.

On February 24, 2022, the initial Russian plan for the war in Ukraine was based on false expectations and the success of the results of the Russian hybrid war operations carried out so far. In particular, Moscow's indirect tactics against Ukraine should have created a favourable environment for Moscow to intervene and potentially occupy the majority of Ukraine through local administrations and pro-Russian volunteers.

As a result of the events of 2014-15 in Ukraine, the annexation of Crimea, events in Syria, political manipulations in various Western countries, interference in elections, political murders, support for various radical groups, and, in general, the confusion of a unified political discourse in the West, "emboldened" Moscow and, in particular, Vladimir Putin. , it seems that a solid syndrome of impunity appeared, that his attempt to finally solve the "Ukraine problem" would remain absolutely unpunished. In other words, the so-called Russian hybrid warfare would continue to be the main formula for victory.

The decision to start the war was made on the basis that the Clausewitzian trinity we mentioned - Government, People, Army Union, in the case of Ukraine, as a result of years of Russian hybrid warfare (in our opinion, hybrid methods) efforts, was so weak and unstable that Moscow's immediate attack on Kiev and after the capture of the government quarters, organized resistance had to be crushed. Therefore, the balance of military forces unfavourable to Moscow before the start of the war should not have become an important factor. As it seems, such an idea prevailed first of all in the idea of the Russian President Vladimir Putin, and the entire Russian military-political elite was directed to strengthen this image. Even the "episodes" of the Security Council session shown on TV before the start of the war lead us to draw such a conclusion. It seems that the practice of turning what is desired into reality in the Kremlin has been accepted so much that the entire Russian military-political elite, or the largest part of it with the boldness of Vladimir Putin, looked in this crooked mirror of reality, where Putin, supported by Russia's impunity from the West and recent "successes", could not fulfill his geopolitical ambitions. For the realization of the main final chord, it remained only to take a decisive step to finally establish Ukraine in the Russian space.

The history of human wars knows more than one example when military-strategic calculations subordinated to wrong political goals or expectations became the reason for the failure of states in the war and, in general, their presence became a matter of non-existence. No matter how modern equipped, armed, and motivated an army may be in pursuit of the military objectives set by its political leadership, if these objectives are based on miscalculations and expectations, and completely subjugate the war strategy to these misrepresentations, then such military campaigns are most likely It is doomed to collapse, and the actions of the Russian armed forces in the first phase of the war in Ukraine will become such an example for the military history of mankind.

In Moscow, the military-political expectations determined by the hybrid war approaches were subordinated to the start of a war against the largest state in Europe, in relation to which the Russian army did not have adequate resources, primarily human, to fulfill the tasks actually set, therefore, all bets were placed on the quick defeat of Kiev, with the expectation that Ukraine The people and the political authorities would not have put up enough resistance if everything was



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ready for the 5th column to be launched and the Russian army would have had to enter Kiev with a triumphant march amid only minor opposition. In other words, the union of Clausewitz's “trinity - government, army, people”²⁵ would be so weak in the case of Ukraine that Moscow would be able to break Ukraine's will to resist without much effort.

Today, we all clearly see that the war in Ukraine is another classic example, where the unity of Clausewitz's trinity works successfully - the government completely provides the military-political and diplomatic dimension of the war, thus the backed army fights firmly and with a high fighting spirit, and the people have the necessary and most important moral character for this process. It is a source of spiritual strength and an economic backbone. As a result, the connection between the components of the trinity is strong and in the conditions of foreign aid ensures the successful actions of Ukrainian troops against the occupiers.

The Russian military machine, caught in the wrong military-political calculations of its own political leadership and forced to change the plan of combat operations as a result of the initial defeat, is in a much more disadvantageous situation and is trying to perform limited tasks, which according to its calculations should become the basis of profitable political trade at the negotiating table. Despite such efforts, Russia has lost the war, from a strategic point of view, as a result of wrong military-theoretical and political calculations before its start, primarily due to its successful use of hybrid instruments in recent years.

In recent years, the fascination with the question of hybrid warfare has become a special phenomenon, and it has often been presented as a completely new or difficult to explain phenomenon in military theory. Moreover, it was often presented as the main strategic method of wars conducted by states, which caused skepticism, because the talk that conventional wars have eaten up time, great powers will no longer use traditional means and methods of war, was naturally false, and the Russia-Ukraine war This was well demonstrated once again. Moreover, Russia's military failure was caused by a failure to implement the principles of traditional, fundamental warfare - a complete failure of intelligence, logistics, command and control. In such conditions, no hybrid warfare method can help the armed forces. The Russian-Ukrainian war is a very good example of the fact that unsubstantiated obsession with certain theories and concepts, as has happened many times before, can become a matter of presence or absence for the state and its leadership, therefore the military-political elite of any country should understand the fundamental principles of war, era and the potential impact of specific circumstances on the course of the planned war and only then take the appropriate steps.

The use of non-military means as military weapons is a hallmark of 21st century Russian warfare. Russia's goal is to create a permanent front that will break the boundaries between peace and war, create chaos and disorder, shake the state foundations of “disloyal neighbors”. After the February 24, 2022 Russian invasion of the Ukraine search for hybrid elements in Russia's actions began, comparing the developments with the annexation of Crimea in 2014. From the beginning of the war until today, we see that, Russia cannot achieve its goal, as it managed in Crimea. The question arises: what distinguishes today's Russia from the Russia of 2014? And what distinguishes today's Ukraine from Ukraine in 2014?

Putin, traditionally, used to his advantage the dependence of European countries on Russian natural resources and as I mentioned above, Putin was emboldened, which led to the start of hostilities on his part, mainly during the winter period (Crimea - February 20, Ukraine - February 24). Moscow creates a syndrome of fear and thus tries to indirectly influence the will of political actors. Russia's actions in Crimea began with the manipulation of public opinion. The



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"willingness of the people"²⁶ in Crimea to join the Russian Federation became a pretext for carrying out hostilities. In 2014, along with the military conflict, the world saw numerous cases of cyber-attacks, disinformation and propaganda. The cyber-attacks carried out by Russia on Ukraine caused a communication collapse, primarily aimed at disconnecting members of parliament from the contact space. In addition, the Ukrainian government's website became the target of the hacking attack; "It was not functioning even 72 hours after the annexation of Crimea."²⁷ In order to demoralize the population, telephone messages were sent to the family members of the soldiers, giving "false information"²⁸ about their deaths. With all this, it took Russia only one month to achieve its goal. All attempts by Ukraine to counter the attacks have been unsuccessful.

Russia did not betray its usual tactics in 2022 either. He began using active measures, including espionage, cyber-attacks and disinformation, before military attacks. Putin aimed to dismantle the national security system of Ukraine, prevent the proper functioning of state institutions; In addition, access to reliable information and vital services was restricted for Ukrainians. All this would lead to the loss of trust in the state, facilitate the conduct of military operations and, ultimately, the conquest of Ukraine. The ratio of use of non-military means to military means was much higher. By fighting against Ukrainian "disinformation", Russia justified the attack on the TV tower in Kyiv. Before the siege of Mariupol, telephone messages were sent to the population with the content "your government has abandoned you."²⁹ Several times there was blackmail with the use of nuclear weapons and radioactive substances.

As we can see, Russia's action tactics have not changed significantly from 2014 to 2022, but the results of the action have changed: cyber-attacks - more or less, espionage and disinformation have turned out to be largely ineffective, and if we compared to 2014, Russia began to use military force on a larger scale, but in comparison to 2014, Ukraine has significantly changed its tactics for combating Russia's hybrid attacks in 2022. Ukraine confronted Russia in all dimensions of the war. against Russian propaganda, they use a variety of social media methods. The daily communication of the government, especially President Volodymyr Zelensky, with the Ukrainian people raised public morale. The coverage of the events and the distribution of photo-video material exposed the Russian brutality.

Ukrainian President Volodymyr Zelensky explained every day in his daily speeches that Russia's victory would be the defeat not only of Ukraine but of the entire Western world. The activation of this rhetoric gained Ukraine international trust and support. Ukraine clearly showed the world that the line between Russia and the West passed through it. In the event of the defeat of Ukraine, Russia would continue its military expansion, and its main target would be post-socialist countries, primarily Poland or the Baltic states. "Finland and Sweden (18 May 2022) simultaneously handed in their official letters of application to join NATO"³⁰ and became members in a short period of time after the war began to protect against potential threats, proving the validity of these opinions. The West has provided extensive support to Ukraine through the transfer of IT equipment, software and training. Along with private sector assistance, real-time cyber intervention by European and US cyber agencies was critical. Because of the initial expectation of a short war, Moscow's cyberattack against Ukraine turned out to be ill-prepared.

On the question, what differentiates today's Russia from the Russia of 2014? And what differentiates today's Ukraine from Ukraine in 2014? The answer is as follows: today's Russia is not significantly different from the Russia of 2014, which cannot be said about Ukraine. The annexation of Crimea became a bitter lesson in how to fight a Russian hybrid war. In 2022,



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Ukraine began to respond to all types of attacks and use non-military means as weapons of war. With his own efforts and the support of the West, he proved to us that it is possible to effectively fight Russia's hybrid war.

Additionally, key implications arise for the defense and security studies community. First, territorial wars have different end states compared to irregular wars, counterinsurgencies, and civil wars. Thus, militaries must be tailored to the specific conflict. For example, a counterinsurgency force cannot win a territorial war against an industrialized army designed for attrition. Policymakers and military leaders must understand this when planning future forces.

Second, territorial wars require strategies that align with their specific objectives. A strategy focused on precision strikes without adequate land forces will fail in a territorial war, especially against an industrialized army designed for attrition. Policymakers and military leaders must regularly reassess and adjust their political goals and strategies to ensure resources are used effectively and realistically.

Third, physical mass—meaning more manpower—is crucial in territorial wars, often more so than precision strikes and long-range fires. An army with greater manpower can better hold and defend territory, making it more resilient to attacks and harder to defeat, both in terms of resources expended and lives lost.

Fourth, overcoming a well-prepared, layered defense, like Russia's in Ukraine, is extremely difficult. The challenge increases if the attacking force lacks resilient land forces capable of³¹ defeating the occupying army,³² moving into liberated territory, and³³ controlling that land. Armies that can strike but lack the depth to advance and hold territory are ineffective beyond defense. This contradicts the conventional belief that future forces should be small, light, and dispersed.

Fifth, Carl von Clausewitz's warning that “So long as I have not overthrown my opponent, I am bound to fear he may overthrow me. Thus, I am not in control, he dictates to me as much as I dictate to him.” it means an unresolved conflict keeps both sides vulnerable is evident in the Russo-Ukrainian War. Neither side can decisively defeat the other, resulting in a prolonged stalemate. This highlights the necessity for a military force that can not only defeat the opponent but also secure and hold territory. Without such a force, tactical gains are temporary, and the war remains protracted. Decisive victories can potentially turn a long war of attrition into a shorter one.

Based on the declared interests of Russia, its strategic goals can be formulated as follows:

- fracture the Ukrainian state—politically, territorially and culturally;
- maintain sufficient territorial acquisitions to support a range of acceptable political-military outcomes;
- maintain strategic materiel overmatch;
- exhaust Ukraine's ability to continue fighting—both materially and as regards Ukrainian support from the international community;
- normalize the conflict's abnormalities; and
- undercut and erode Ukraine's ability to conduct offensive operations to reclaim annexed territory.

Collectively, these objectives indicate that Russia aims to denationalize Ukraine. Raphael Lemkin defines "denationalization" as systematically eroding or destroying another state's national character and identity, including its culture, language, and customs.”³⁴ Since February 2022, Russia's policy and military goals have slightly evolved, but the denationalization of



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Ukraine remains central to the Kremlin's strategy. In 2022, Russia sought to remove President Zelenskyy, end Ukrainian self-rule, install a pro-Russian leadership, and annex significant Ukrainian territory. Putin spoke of "DE nazifying" and "Demilitarizing" Ukraine, aiming to keep it politically and militarily neutral."³⁵ He reaffirmed these goals in a "December 2023 press conference."³⁶ However, Russia's military efforts have stalled since failing to capture Kyiv in April 2022. Nonetheless, the possibility of renewed efforts to oust Zelenskyy in 2024 remains, especially if U.S. support to Ukraine remains halted.

The Kremlin appears to be prolonging the conflict to outlast Ukraine's financial and military support from the international community and deplete Ukraine's resources for offensive operations. By doing so, Russia likely aims to push Ukraine toward strategic exhaustion, eventually forcing Kyiv to negotiate a peace deal. It seems that, "Russia's territorial ambitions in Ukraine span a range of acceptable outcomes."³⁷ At a minimum, Russia aims to retain control of the Donbas, the land bridge to Crimea, and Crimea itself. This land bridge includes the Zaporizhian and Kherson oblasts, providing a continuous ground link between the Donbas and Crimea. This connection is crucial for Russia as it simplifies the governance, defense, and retention of Crimea.

The presence of Chinese, North Korean, and Iranian weapons on the Ukrainian battlefield indicates that "Russia is struggling to sustain the conflict's attritional nature."³⁸ Although it is difficult to gauge the extent of external support through open sources, it is clear that this aid helps Russia overcome some of its defense industry's production and distribution shortfalls. Consequently, support from these countries enables the Kremlin to prolong the conflict, aiming to exhaust Ukraine's military and deplete Kyiv's capacity to sustain its resistance.

Russia has endured the initial risks of invading Ukraine. Although early economic sanctions hit hard, Russian industry and the economy adapted, with help from "China, North Korea, and Iran, to offset many challenges."³⁹ Additionally, the gradual Western support has given Russian forces time to observe, learn, and adapt to those weapon systems, developing effective countermeasures to "Western technology and firepower."⁴⁰ Such an approach questions the "U.S. and other Western states' strategy of third-party support to Ukraine."⁴¹ The primary risks the Russo-Ukrainian War poses to Russia today are: 1) U.S. and/or NATO intervention with land forces on behalf of Ukraine. 2) Political upheaval due to domestic unrest.

The risk of U.S. and/or NATO intervention with land forces is low, likely remaining so due to "fears of Russian escalation with nuclear weapons."⁴² Although the likelihood of Russian nuclear strikes in Ukraine is also low, Russian leaders frequently use "nuclear threats to deter unwanted actions."⁴³ For example, Russia's Deputy Security Council Chairman recently threatened nuclear retaliation if Ukraine used "Western-supplied long-range missiles to attack Russian missile sites."⁴⁴ This follows Russia's "repositioning of some nuclear arsenal to Belarus in summer 2023."⁴⁵ However, without U.S. or NATO land forces' involvement or the potential loss of Crimea, the likelihood of Russia using nuclear weapons remains low.

To mitigate the risk of domestic unrest and political instability, Putin and his supporters employ traditional Russian methods. These include "arrests, assassinations, disappearances, and suppression to deter opposition to policies on Ukraine."⁴⁶ The assassination of "Yevgeny Prigozhin, head of the Wagner Group, in August 2023 is a high-profile example."⁴⁷ Similarly, the "periodic disappearances, imprisonments and death in prison of Alexei Navalny"⁴⁸ demonstrate the regime's efforts to silence political opposition. Additionally, "Igor Girkin, a critic of Putin's handling of the war, was sentenced to four years in prison in January 2024."⁴⁹



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Suppression of "journalists has also intensified, aiming to silence dissent amid the economic and domestic upheavals caused by the war."⁵⁰

Former U.S. Army Europe commander, Lieutenant General Ben Hodges, states that Russia "mobilizes citizens from peripheral and rural areas for the war in Ukraine."⁵¹ Many of these individuals are "ethnic minorities, considered of lesser importance in Putin's social hierarchy."⁵² By drawing heavily from regions outside major population centers like Moscow and St. Petersburg, Putin mitigates potential domestic unrest, as "combat losses are borne by those with lower social status."⁵³ This strategy allows Putin to prolong the conflict and attempt to weaken Ukrainian and Western resolve.

If winning in war is defined by achieving political-military objectives at the expense of the adversary's goals, Russia has made little tangible progress in two years. Its strategy of exhaustion and territorial annexation is progressing but at high costs to the Russian economy and people. Despite this, Russia's strong defensive fortifications indicate it will likely retain the upper hand on the battlefield.

Ukraine aims to liberate its territory, including the "Donbas and Crimea, and restore its 1991 borders."⁵⁴ Additionally, Ukraine seeks to strengthen ties with the West, pursuing security partnerships and EU membership. Zelenskyy's government continues to seek "political, military, and economic support from the international community."⁵⁵ Kyiv's efforts to join the EU and maintain international support are arguably more achievable than removing Russian forces from its territory. From a tactical perspective, Ukraine faces the daunting task of reclaiming "nearly 20 percent of its land, even to retake a small portion."⁵⁶ Compounding the problem is the size of Russia's occupation force. Putin has indicated that "Russia has 670,000 soldiers committed to the conflict, a significant increase from the initial 190,000."⁵⁷ While these numbers are hard to verify, assuming all 670,000 are in Ukraine, the traditional 3:1 attacker-to-defender ratio suggests Ukraine would need over two million troops for a successful attack. Are two million troops really necessary to evict Russian forces and hold against a counterattack? Some analysts, old and current, argue that "the 3:1 ratio is flawed and irrelevant."⁵⁸ Alternatively, modern technology might reduce the need for such a large number of land forces.

Despite advancements in technology, such as long-range precision strikes, drones, and targeting information, these tools support but do not replace the essential role of land forces in advancing or defending positions. Technology must be considered in the context of both supporting operations and countering adversarial actions. If Russia's strategy focuses on retaining territory and conducting defensive operations, and Ukraine lacks sufficient forces for a successful attack-defeat-occupy-defend sequence, then reliance on technology alone may be inadequate. This imbalance between Kyiv's goals and its resources contributes to the conflict's characterization as a war of attrition.

The greatest risk to Ukraine's strategy for winning the war against Russia is the potential loss of political, financial, and military support from the U.S. and other European partners. One of Kyiv's biggest strategic risks is depleting its military forces to the point where Russian forces could exploit vulnerable positions and seize more territory. For example, Ukraine's counteroffensive in the summer of 2023 might have created weak spots in its lines, potentially allowing a localized Russian counterattack to achieve an operational breakthrough. While this didn't occur, it's a critical consideration for military planners if Zelenskyy aims to liberate all Ukrainian territory from Russian control. Reclaiming Crimea could be a game-changer. Putin has declared "Crimea as Russia's red line,"⁵⁹ implying a nuclear response to any serious



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Ukrainian attempt to retake the peninsula. Policymakers and strategists in Kyiv must consider this before making any moves to seize and hold Crimea. While some might see Putin's red line as a bluff, the threat is credible given his deployment of nuclear weapons to Belarus and repositioning of nuclear strike weapons near Ukraine earlier in the conflict.

As noted in the section on Ukraine's strategic ends, "manpower is the biggest resource inhibiting Ukraine from attaining its political-military objectives."⁶⁰ Even if Kyiv initiates conscription, it would need to train an army of over two million troops to remove Russian forces, based on the 3:1 attacker-to-defender ratio. Technology, such as precision strike weapons, drones, and advanced intelligence, might shift this ratio to 2:1 or even 1.5:1 in open combat. However, this advantage diminishes in urban areas due to International Humanitarian Law and the complexities of targeting, highlighting the challenges of urban warfare.

The math gets even more challenging when this context is applied. Trevor Dupuy writes that, "The 3:1 force ratio requirement for the attacker cannot be of useful value without some knowledge of the behavioral and other combat variable factors involved."⁶¹ Factors like the operating environment, the type of opponent, and their historical combat methods must be considered. Both theory and military doctrine suggest that "the attacker-to-defender ratio in urban environments increases from 3:1 to 6:1."⁶²

Given the many cities in Ukraine's occupied areas and the extensive front lines, this presents a significant challenge. Hypothetically, Russian forces could strong-point cities like Donetsk, Mariupol, Melitopol, Simferopol, and Sevastopol, creating a network of interlocked defense points. This would require Ukraine to apply a ratio of 3:1 to 6:1 in combat power, increasing the overall force needed to remove Russian troops. If Ukraine removes Russian forces, it must also consider the potential for insurgency. Retaking territory is one challenge; securing loyalty is another. Donetsk, Luhansk, and Crimea have been under Russian control for a decade, making their political loyalties uncertain. Therefore, the possibility of insurgency in these regions must be factored into the human capital needed for reclaiming and holding them.

The shortage of essential ammunition, such as artillery, rockets, and anti-aircraft missiles, is a major issue for Ukraine's battlefield success. Although Congress approved funding in March 2024, the delay caused a significant gap in support, worsening the ammunition crisis and potentially creating a more critical situation. Currently, Ukrainian units are nearing the point where they can only defend and hold the front lines. Without sufficient ammunition, they will be unable to conduct robust offensive operations necessary to penetrate Russian defenses and defeat Russian forces. Also, a delay is developing between the time when the military can deliver equipment funded by Congress and when Ukrainian forces can use it. During this interim, Russian offensive operations have increased, while Ukraine's ability to defend effectively has decreased. Consequently, Russian forces right now trying to penetrate Ukrainian lines to exploit the ammunition crisis and gain additional territory to strengthen their future bargaining position.

Ukraine's strategic ends are significantly constrained by its limited manpower and ammunition. These limitations hinder Ukraine's ability to offensively retake the Donbas, the land bridge to Crimea, and Crimea itself. Michael Kofman and Franz-Stefan Gady assumption that, for the foreseeable future, "Ukrainian forces are limited to defensive operations along the contact line and to small, limited objective offensives with operations."⁶³ Although Gady's assessment was more optimistic than Kofman's, both analysts suggest a very challenging 2024 for Kyiv's armed forces. They agree that Ukraine will likely be limited to defending the contact line, with sufficient force to prevent Russian breakthroughs.



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The key finding is that Ukraine lacks the capability for offensive operations on the scale needed to retake significant territories from Russia. While precision strikes and air power can assist, Ukrainian ground forces must still physically clear, hold, and defend the terrain against Russian counterattacks. Therefore, any large-scale Ukrainian offensive is unlikely through 2024. Ukraine may attempt smaller-scale offensives, but larger operations exceed its current capabilities. U.S. weapons, ammunition, and military equipment are crucial for Ukraine. However, delays in supply delivery are weakening Ukraine's armed forces and hindering the development of effective military strategy. As a result, 2024 appears challenging for Ukraine to achieve its political-military objectives. Moreover, Ukraine's manpower limitations will continue to prevent large-scale offensives in 2024. While support from the United States and other Western nations can alleviate some of these challenges, they won't entirely eliminate them. As a result, the conflict is likely to remain characterized by attritional warfare between opposing trench networks throughout 2024.

The current state of the Russo-Ukrainian War is a stalemate, driven by conflicting strategies. While Russia aims to retain annexed territory, Ukraine lacks the means to forcibly remove Russian forces. Ukraine's ability to liberate and hold occupied areas is questionable due to manpower and resource constraints. Thus, precision strike strategies and light-footprint approaches are inadequate against industrialized armies geared towards physical destruction and territorial control. The future of warfare lies in robust land forces capable of overwhelming firepower and seizing territory from aggressor armies, marking a departure from past 20th-century conflicts.

Russia's actions in Ukraine highlight the supremacy of mass over precision. While precision tactics may secure tactical victories in isolated instances, they often fall short in achieving strategic success. Dismissing Russia's mass strategy as "stupid" overlooks its effectiveness in achieving strategic objectives. In conflicts centered on territorial annexation, mass plays a crucial role in solidifying gains and defending against counterattacks, demonstrating its significance in warfare.

As a small conclusion, I would like to mention that, The Russo-Ukrainian War highlights the importance of defeating enemy armies to secure long-term stability. Ukraine's failure to neutralize Russia's forces means ongoing challenges from Kremlin ambitions. Without the capability to decisively defeat and hold territory, the conflict may endure until Ukraine can expel Russian forces, reaches strategic exhaustion, or both sides seek resolution. In the interim, Kyiv will focus on fortifying its position while building its military capacity for future success.

4. Conclusions

The conflict in Ukraine has imparted several crucial lessons for the international community. Firstly, it has shown the importance of adaptability in diplomatic strategies. A united and strong international stance against Russian aggression resulted from the visible resilience and effective communication displayed by the Ukrainian leadership, which swiftly dispelled the initial skepticism of world leaders.

Economic sanctions have proven to be a powerful tool, inflicting significant damage on the Russian economy and demonstrating the effectiveness of coordinated financial measures. However, these sanctions also highlighted the necessity for long-term planning and the potential repercussions on global markets.



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The extensive military and humanitarian aid provided to Ukraine has been vital in sustaining its defense capabilities. This support emphasizes the importance of a sustained international commitment to counter aggression and protect sovereign nations. The conflict has reaffirmed the critical need for a unified global response to uphold democratic values and international law.

In conclusion, the Ukraine conflict has underscored the evolving nature of warfare and the necessity for adaptive, coordinated international strategies. The lessons learned from this conflict will be instrumental in shaping future responses to global crises, ensuring that the international community remains vigilant and prepared to uphold the principles of sovereignty and democracy.

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**THE ENVIRONMENTAL FALLOUT OF ARMED CONFLICTS :
ASSESSING THE IMPACT OF THE WAR IN UKRAINE**

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Abstract:

Our paper subject is about the war waged by Russia against Ukraine which generated disastrous effects on the environment both in Ukraine and in its neighboring, cross-border countries. We consider that this issue is about losses of human life, as well as massive air, soil and water pollution. In this sense, the European Economic and Social Committee requested the Commission and the EU Council to identify the negative effects on the environment and their implications on human rights. Also, we will have mention in this paper about the current political situations indicating that national and international security are dependent on each other, and peace and security in Europe is a priority of all its citizens.

Key words: environmental protection, war, pollution of environmental factors, the European Union, military factors, the effects of military conflicts;

1. Introduction

Romania is located at the crossroads of trade routes, at the crossroads of civilizations and at the edge of the European Union. It is the state from which what was called in geopolitics the Slavic continent from the east, with Ukrainians and Russians together. We are, what Nicolae Iorga called: "a state of European necessity." [3]

From a geopolitical point of view, the favorable position of Romania often involved elements of vulnerability. Russia's unjust war of aggression against Ukraine also produced effects in its neighboring countries: Romania, Hungary, Poland, the Baltic countries.

The environment is increasingly affected by the war, leading to an expanding ecological crisis in Ukraine and the neighboring regions.

National and international security are interdependent, and the protection of the environment and citizens are interconnected, being part of this security.

2. War kills nature

According to the Rio de Janeiro Declaration on Environment and Development (1992), "sustainable development is that development process that meets current needs without jeopardizing the ability of future generations to meet their own needs [...]. Environmental



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protection will be an integral part of the development process and cannot be approached independently of it." [1]

The European Union sent a series of conclusions and recommendations related to Ukraine's candidacy for EU membership [2, 5].

"1.2. Among the damages caused by the war to the environment is the degradation of ecosystems, air and water pollution, as well as the contamination of arable land and forests.

[...]

1.5. It draws attention to the social and environmental impact of Russia's invasion [...] to build the foundations of a green and sustainable post-war recovery."

1.6. Invites the Commission and the Council to identify the negative environmental effects of Russia's illegal war against Ukraine.

1.7. Urges the E.U. to contribute to the protection of the environment in Ukraine and to repair the damage caused by the war to the environment.

1.8. [...] The interconnection between the environment and human health is obvious, especially in the field of food security. [...] Human health cannot be separated from the quality of the environment." [3]

According to the sociologist Gaston Bouthoul (1896-1980), war has a series of features, such as: "violent, methodical and organized character, limitation in time and space, legal constraint, bloody character." [4]

The improvement of the means of combat led to the appearance of radioactive chemical and bacteriological weapons: it has direct and indirect effects on living beings and the environment, destroying them; the effects are sometimes irreversible. Soil, water, air are polluted and destroyed; there are imbalances in everything that represents life and biodiversity. These can have long lasting effects, up to hundreds of years.

"All kinds of smart weapons have been invented and perfected, with the ability to track moving targets, with laser beams, with microprocessors and chips." [10] "Military risks and threats to the environment represent a problem related to the means of war [...] to produce the destruction and annihilation of the human and material potential of the adversary." [10] The long-term effects can be seen in climate change and in everything that represents environmental protection (or the lack of environmental protection).

Russia's unjust war against Ukraine also affects the environment. In addition to the human victims, the destruction of the economy, the infrastructure, the environment is strongly affected. The impact is global and long-term.

The war, hostilities are ongoing; the figures and calculations provided and synthesized by local and international observers represent an estimate of the environmental crisis in Ukraine and neighboring countries [11].

"Ecocide refers to the massive destruction of the environment through serious, repeated, large-scale actions, with serious consequences on the biodiversity of the earth, waters, forests, air, fauna and flora by reducing the space considered natural habitat." [7]

The UN General Assembly adopted the 2030 Agenda through the Resolution of September 25, 2015, regarding "The right of future generations to a clean and healthy environment." The signatory states are committed to prevent and resolve armed conflicts, to support the post-conflict recovery of the countries involved. The document includes "the environment-armed conflict relationship." [8]



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The European Parliament recommended to the European Council on February 8, 2022: "In this sense, the European Parliament encourages the EU and the member states to promote the recognition of ecocide as an international crime, based on the Rome Statute of the International Criminal Court."

According to the data provided by the Ministry of the Environment of Ukraine, Ruslan Strelet, the following were found [6]:

- 46 tons of toxic substances were released into the atmosphere in 6 months of 2022 compared to 2 tons of toxic substances released in the previous year;
- 499,000 tons of toxic substances were released from 40 oil depots in Ukraine that were set on fire. Heavy metals, sulfur dioxide, nitrogen oxides, soot were released into the air by burning. These in turn pollute the water and the soil, not only the air.

Ukraine, one of the large countries of Europe, has a total area of 603,628 km², of which 42,000,000 ha is agricultural land.

Fertile lands with consistent layers of chernoziom were strongly affected by the war started by Russia against Ukraine.

Soil degradation occurs through:

- Explosive objects and destroyed equipment: results in heavy metal emissions that pollute the soil for decades. The heavy metals released are: lead, chromium, arsenic, mercury, nickel, zinc, cadmium. Depleted uranium residues may appear.
- During the explosions, toxic substances are released that fall on the ground. Mechanical degradation also occurs, resulting from the passage of heavy machinery over the land.
- Soil pollution occurs through the bombing of chemical and oil processing companies.

All polluting substances from the surface of the soil enter the food chain, affecting it.

The consequences of the war lead to desertification and soil erosion. Dangerous substances enter the soil, eventually ending up in plants and grains consumed by humans.

A major problem is represented by mined areas. Following their explosions, the soil is contaminated with heavy metals.

According to the United Nations and the government of Ukraine, it was estimated that in February 2024 almost 30% of the country's territory was mined.

Tony Blair, executive chairman of the Tony Blair Institute for Global Change, said: "This is not just a Ukrainian problem; it is a global imperative."

The World Bank has estimated that it will be necessary to allocate approximately 37.0 billion dollars to determine Ukraine in safe conditions (according to BBC 2023). Peter Smith, former British army officer and manager of the demining NGO HALO in Ukraine, said that it would take at least 10 years and 10,000 engineers to decontaminate the country.

Air pollution, resulting from sulfur and nitrogen oxides, will have as a consequence acid folds. The spreading directions are vertical and/or horizontal depending on the structure of the atmosphere and the temperature distribution.

The spread of pollutants in the air depends on the humidity and temperature of the air and the speed of air currents (wind). Acid rain affects forests, especially conifers, the productivity and quality of agricultural products.

According to the Environmental State Inspectorate of Ukraine, by the summer of 2023, major damages have occurred that affected the soil, air and water, estimated at 52 billion endowments.



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These will be seen in the long term and will affect the entire European ecosystem (see figure below, Fig.1).

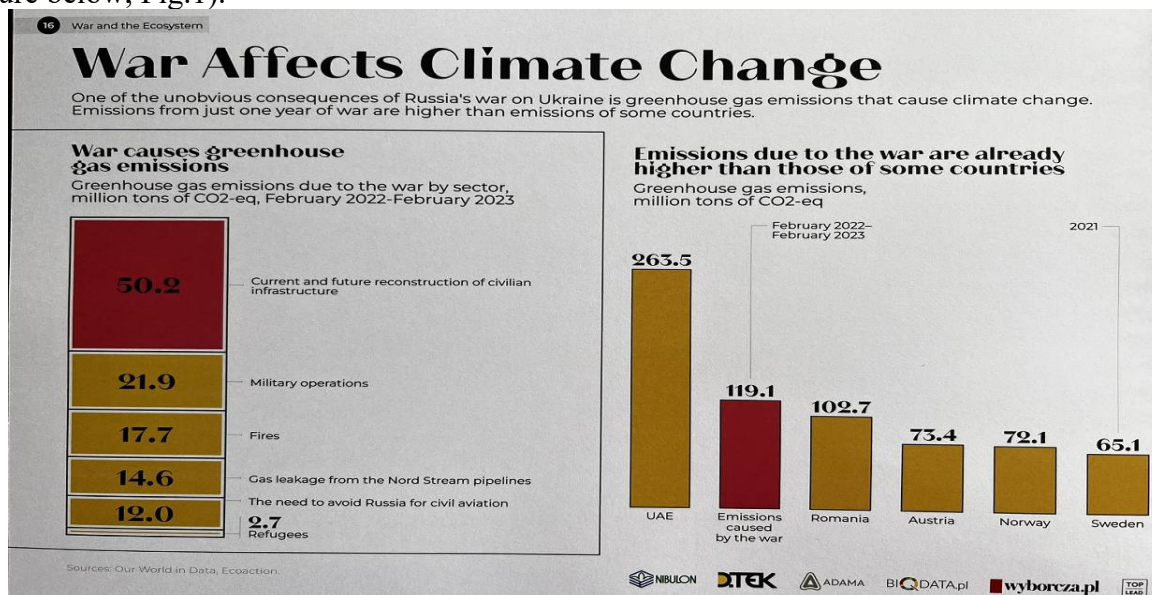


Fig.1. Putin's War on Nature in Ukraine: Ecological Time Bomb for Europe [9]

Military actions produce emissions of greenhouse gases that negatively accelerate climate change, namely: high temperature currencies, rising temperatures, drought, storms with rains with historic flows and unnaturally strong wind, natural disasters.

As is known, water is an environmental element without which life is not possible. And, by polluting water courses, we can say that the safety of life, of the population, is strongly affected.

As presented by the news from all over the world, in June 2023, it was the Nova Kakhmovka dam in Ukraine (fig.2). The volume of water in the dam was 18 million cubic meters. The serious damage of this dam produced a massive disaster; humanitarian or environmental protection norms were not respected.



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Fig.2. The massive floods after the destruction of the Nova Kahovka dam in Kherson / (photo source: Shutterstock) [12]

According to the UN representative, Martin Griffiths, the destruction of the dam on the Dnieper River had a strong impact on the related watershed. Thus, as a result of this:

- agricultural areas were flooded,
- there was the problem of cooling the reactors at the Zaporozhie nuclear power plant,
- the number of people who needed drinking water was estimated at 700,000,
- about 16,000 people lost their homes,
- the information referred to the western bank of the Dnieper because on the eastern bank, controlled by the Russians, the UN representatives did not have access.

As I said above, water quality is strongly affected by the war in Ukraine. This is because:

- heavy metals migrate into the underground water, as a result the water table is also affected,

- the Dnieper River flows into the Black Sea, which in turn can be more or less polluted, depending on the discharged flows and dilution,

- Russia has suspended and blocked the inspections of international experts regarding the control regime of the weapons used; the disasters caused and environmental pollution are part of Russia's war of aggression against Ukraine.

3. Conclusions

Among the many legal documents that must be respected in the conflict between Russia and Ukraine are those related to the environment:

- The Geneva Convention of 1949,
- The Convention on the Prohibition of Environmental Modification Techniques for Military or Any Other Hostile Purposes from 1976, from The Hague,
- The 1972 Hague Biological Weapons Convention,
- The Hague Chemical Weapons Convention of 1993,



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- The 1977 Convention on the use for military purposes of environmental modification techniques.

They represent part of the conventions and treaties related to environmental protection in case of armed conflicts.

Although the war is not over, governments, international organizations and civil society are cooperating to monitor and inventory the damage caused to the environment in Ukraine.

The environment should not be considered a military objective.

After the cessation of hostilities/war in Ukraine, the aftermath of rocket and bomb explosions will continue to affect the environment and life in Ukraine and neighboring countries, including Romania.

The invasion of Ukraine by Russia turned Ukraine into the most mined country in the world, with serious consequences regarding global insecurity.

The degradation of the environment in Ukraine and the neighboring areas represents a threat to the whole of Europe. The war generated unprecedented and long-lasting challenges in the field of the environment.

The reconstruction efforts will be supported by the EU countries, with respect for human rights and environmental legislation.

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HOW THE GLOBAL LANDSCAPE SHIFTS AND CHANGES THE DEFENSE RESOURCES MANAGEMENT PROCESS

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Abstract:

Every state considers its defense as important and maintains minimum defense deterrence against any type of foreign aggression. However, due to recent shifts in the global landscape, the defense resources management require realignment in order to cope with the challenges. Be it the Russian attack on Ukraine and its fall outs on global supply chain system; the trade war between America and China due to Thucydides trap; ever increasing risks to human lives due to sudden climate havocs; the ever sequencing resources due to debt burdens, the tech giants capitals coupled with their increasing influence on human beings beyond frontiers and last but not least the risk of any other pandemic like COVID-19 is compelling the policy makers to reconsider the defense resources management process in order to effectively address any kind of eventuality.

Key words: landscape shift, Thucydides trap, debt burden, climate change, techno dynamics, pandemic.

1.Introduction

Change is the unchangeable law of nature. It is very true that the one who foresees and adapt itself, can survive the tide of change. In the global political landscape, the events are changing rapidly which are compelling every nation state to reconsider its defense needs and resources in order to cope with the volatile and potentially difficult challenges. There is a long list of potential shifts but this research work will focus on Thucydides’ trap between America and China, Russian invasion of Ukraine, the climate change, the over increasing debt burden, the tech advancement and pandemic challenges. Detailed analysis of every problem reveals that in order to achieve peace, preparation for war has become a necessary and indispensable evil.

2. Thucydides’s Trap And Hard Choices

Gram Allison while analyzing the Thucydides’ trap between America and China has quoted the statement of Napoleon Bona Parte that ‘let the giant (china) sleep when it will awake it will shake the world’ (Allison, 2017). China has shaken the world with its phenomenal growth and worldwide influence in the shape of OBOR (One Belt One Road) initiative, advancement in AI, quantum computation and projection of its soft power image. What America has done in 20 years, China has replicated it, rather, surpassed it in less than four years span of time. This has put America and China in a Thucydides Trap. According to Thucydides, a Greek historian, the Sparta, the established power, has imposed war on rising Athens (Allison, 2017). Thucydides was a general and historian from Athens. He has elaborated this Thucydides Trap in his book History of the Peloponnesian War. Gram Allison has drawn the analogy of it between rising China and American’s fears while analyzing this trap and emphasized on the importance of avoiding it.

In twelve out sixteen such incidents of Thucydides trap, history has revealed that war could have not been avoided (Allison, 2017). The detail of these case are tabulated below:



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Sr. no	Time period	Established power	Rising power	Outcome
1	late15 th century	Portugal	Spain	No war
2	Early 16 th century	France	Hapsburg	War
3	16 th and 17 th centuries	Hapsburgs	Ottomans	War
4	First half 17 th century	Hapsburgs	Sweden	War
5	Mid fifty and late 17 th century	Dutch Republic	England	War
6	Late 17 th to mid-18 th century	France	Great Britain	War
7	Late18 th and early 19 th century	UK	France	War
8	Mid-19 th century	France	Germany	War
9	Mid-19 th century	France +UK	Russia	War
10	Late19 th and early 20 th century	China and Russia	Japan	War
11	Earlier 20 th century	UK	USA	No war
12	Early 20 th century	UK, France, Russia	Germany	War
13	Mid-20 th century	Soviet, France UK	Germany	War
14	Mid-20 th century	USA	Japan	War
15	1940-1989	Russia	USA	No war
16	1990 till present	UK+ France	Germany	No war

Trade war between China and America has already been started, America has tried to convince its allies about the potential of surveillance which Chinese government can use if 5G is used. Though it is stated that a full-fledged war cannot happen between China and America because of nuclear armaments presence, yet the proxy wars in the potential zones of conflict may get the trigger. These potential areas are, Taiwan, North Korea, together with potential of limited war in South China Sea between China and Japan (Mearsheimer J. J., 2018). Though America's power will decrease in 2030 due to the fact that other rising powers will gain relative powers like China, India, EU, Brazil and Russia (Nye, 2015). Among these potential rising powers the most formidable is China (Mearsheimer J. , 2018). According to Joseph Nye, although China is creating many jobs due to development but not Steve Job hence cannot overtake America till 2041 (Nye, 2015). However, if we look on other side of the coin, though the trade war has been started by America in order to arrest the speedy development of Chinas' rising power, yet due to the strong economy of china while putting all types of restriction, America cannot inflict any major dent into the Chinese economy (Lau, 2019). And since 2018, the ongoing trade war couldn't yield the desired results. The influence of China is increasing with each passing day and month visa-a-vie America because of American engagements in other conflicts like Ukraine, Middle East and internal challenges of rising polarization in politics and economic recessions.

China is creating parallel international system in the shape of OBOR and AIDB (Asian Infrastructure and Development Bank) and is also trying to project its soft image through advocating the policy of non-interference into the internal affairs of other countries, respect for diverse culture and helping nations to resolve their mutual animosities like the normalization of relations between Saudi Arabia and Iran. Whether China will be able to take the leading role as super power? Whether



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it will defeat the American led system? If yes, then what will be status of US and its allies? Or the prevailing situation of tug of animosities will take considerable time and may lead to a multipolar system? These are the important questions for the policy makers. The nations are considering and are realigning their policies carefully. This shift of geo-political land scape also creates the favorable conditions wherein nations has to spend more on its defense. Though alliances are good and prove its utility, yet the best policy is always is the policy of self-reliance and resilience. Increase in self-defense has, therefore, become more important.

Secondly, the 5G of China is a reality and she is unfolding the 6G which may either be ignored or utilized. Nations in alliance with America are reluctant to use it on the pretext of possible espionage by Chines government yet this may be wrong strategy to remain outside the domain of fast development of technologies seems not a wise strategy. This single most superiority can become a problem in the realm of military strategy if ignored altogether. American assessment is of economic gains which China will accrue while selling it to allied nations but since it is a capability which can be employed in military tactics. Therefore, either you have to develop it or you must be using it other way round in order to remain in the game.

3. Ukraine War And Defense Expenditure Spree

Russia waged full-fledged war against Ukraine on 24th February, 2022. Russian aggression started when it annexed Crimea in the year 2014. The triggering cause of this annexation and attack was NATO expansion regarding which Putin has warned many times earlier (Mearsheimer J. , 2018). The European countries and USA are putting their efforts to teach Russia a good lesson but the non-ending conflict has started worsening. The small states in the neighborhood of Russia are much worried since this has shaken the reliance of people on trade and development and has set the momentum for shaping the politico-economic system. This shift in the geopolitical landscape, has triggered the disruption on global supply chain and led to inflation across the world. The neighboring countries in particular and other EU countries in general has therefore started increase in their defense budget. Most of them view that without safeguarding the frontiers, one cannot guarantee the real development and growth. The small states in the proximity of Russia are considering this war an imminent danger to their sovereignty.

There is another view point. It is the defense industry of Russia and America which has created this situation of fear in Europe in order to keep their economies afloat. Due to this Russian aggression, all most all the countries has started increasing their defense budgets and started purchasing new defense plat forms. These countries will keep on spending on the resource because each defense system require life cycle support along with acquisition cost. This view point, however, is not based on facts. The Russians approach is based on previous model of annexation and spread of its world view whereas, America wants that world should prosper with democratic and free capital market system. It has been experienced by the countries in their relationship with USA. The recent attack on Ukraine has once again proved this doctrine of Russia. Since Ukraine is putting a challenging resistance with the overt help of almost all the western countries yet the early ending of war is not possible due to two factors. Firstly, Russian are superior in artillery with the ratio of 5to 1 and secondly, the ground forces strength of Russia verses Ukraine is 5 ratio 1. Hence while controlling 20 to 23% of Ukrainian area, Russia can fight this war for longer period of time.

Since most of the European countries are part of NATO (the current members are 31) and are considering themselves safe against the aggression of Russia, yet this alliance only cannot guarantee the defense to the state. Each states has to rely on its defense capabilities. The defense expenditure which were low in the recent past are increasing now a days yet these are far less because the



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inflation and cost of defense has risen to a much higher level. The rise in defense expenditure seems adjusting the inflation and rising commodities cost instead of more defense capabilities. The PPP (Purchasing power parity) also plays an effective tool in the measurement of defense budget allocation and its utilization. In comparisons to Russia and China both are having superiority in PPP as compared to EU countries and USA. Particularly, China is moving for ahead in this area. Therefore, more defense allocation and its prudent utilization is imperative and need of the day. Because if one wants peace, war preparation is but a necessary evil.

If Russia manages to win this war in Ukraine with the help of China, the tilt of power will shift in opposite direction. Since America and Europe together with their allies are helping Ukraine to defeat Russia. Yet, it seems that Russia has already set the plan for a long time war without getting much damage to its economy. Earlier, US was in a better position to handle the Chinese rise but since Russia has opened a new Pandora box in the shape of Ukraine attack therefore, China seems gaining more strength at the end of the day due to the Ukraine war.

The rising debt burden across the world is very alarming. Many nations are facing this dilemma. Both developed and developing countries have to serve their debts out of revenue receipts and face the huge budget deficits. The debt are increasing on the fast pace. The reasons are numerous. Politicians indulgence in race of false development, balance of payments problems, less tax to GDP ratio, deficit budgeting and deficit financing are the main causes of accumulation of more debts. The debts apparently seems not a big problem, but it slowly entangles its user. There are many other theories and statements of different people who have stated that debt is made the part of deal in order to keep the countries under control. In this regard, the famous book, ‘The Confessions of an Economic Hit man’ is very relevant wherein the writer John Perkins narrated his real life time stories and his missions in different countries to make them indebted. Hence this proves that it is always easy to control the indebted countries.

The world debt is increasing with the rapid pace. In the recent pandemic, many government has taken enormous loans in order to feed their nations and to keep their industries afloat. In this regard the IMF, WB and many other international donors has rescheduled the loans of developing countries which has been hailed as a very positive decision at an international level. However if we look at the data of debt, the alarming figure are coming to the fore front. Many economists have different viewpoints about the debt and its management as well as upper limits but the fact is that it is a ticking time bomb and many nations will bear the brunt of it if it is not cured appropriately. EU

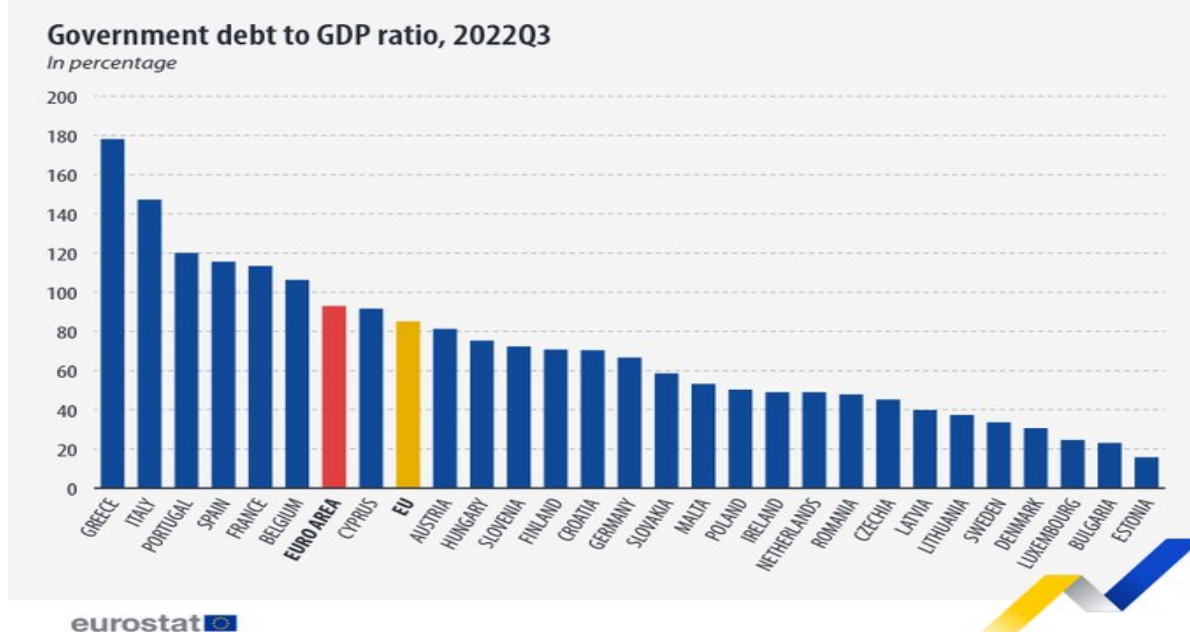


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countries debt to GDP status can be seen in the following figure:



The overall debt of EU is around 85.1% and of Euro area is 93.0% (Eurostate press office, 23 january,2023). The total debt of world at present is 238 percent of global domestic product. In US\$ terms it is 235 trillion (IMF, 2023). The debt of USA is around US\$70 trillion and of China is US\$47.5 trillion (IMF, 2023). This growing debt will be a big challenge in the wake of another economic recession which is predicted to happen in near future, the causes of it can be any but the fact is that it will come and will create ripple effects. Due to debt servicing the space for defense resource management is also squeezing.

The debt will become problem for every nation in future since its over increasing volume will be more crushing and nations have to jointly fight against this ill since it is a common enemy and threat to the welfare and security of entire humanity (Hudson, 2023). While analyzing the history of debt, he describes that how the impact of interest bearing debt led to the rise of rentier oligarchies in Rome and Greece, thereby causing economic polarization, widespread austerity, revolts and battles which led to the collapse of Rome. This is being replicated by pro-creditor western civilization which is on its fast way to collapse (Hudson, 2023).

Jesus (PBUH) asked the forgiveness of interest and debt burden which has been understood as forgiveness of sins (Hudson, 2023). The interest is forbidden in almost all the religions. But intelligent people has given the different definition to interest and the usury and has considered the interest as lawful prerequisite for development and declared usury being unlawful but in fact both interest and usury are the same. There is no difference in both interest and usury (Hudson, 2023). The question of its justification and lawfulness remained a debated question among the scholars and thinkers but one thing from historical record and present data is clear that this debt will come as a major factor halting the effective growth on one hand and will lead to scarcity of resources for better defense resource management. Since governments can neither shun the taste of it nor would be able to solve its multiple impacts on every sphere of society, therefore it is important for every nation to take care of this dilemma otherwise it will engulf much of the available resources chunk. Indebted countries can neither defend themselves nor can be able to feed their countrymen in future. Debt, apparently seems less lethal, is for more dangerous and destructive when it will unleash its impacts.



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One more international recession, will make the economies more and more indebted than before and will lead to complication of problem.

Technological development is creating new dynamics for the defense resource management realignment. The cyber-attack and counter attacks are constantly changing, the drones both air and water are being deployed with rapid pace in the modern warfare. In the recent battle between Azerbaijan and Armenia, the successful use of drones defeated the heavily armed Armenian Army. Thus how the military be ready and trained on these lines has become more important. Defense human resource management, is therefore, facing challenges because the young lot, those who are good in tech-oriented fields are not willing to join armed forces. It is because the private sector offers more lucrative salaries and comfortable job environment than the military. This tech generation which is called Z-generation (the 21st century generation) is different from Millennial (the generation which born during 20th century). This generation is less interested in bravery, vigor and challenging life. Therefore, defense planners either has to train the available human resources or to create equally good ground in order to attract the young capable generation. There is another problem. This is the hatred for war and bloodshed. Young people are less attracted to military be it the competitive salary because they don't want to fight and don't want to kill. Moreover, globalization can also be reckoned as the reason for it since humanity has come closer to each other and system of statehood is fading away.

Though, the employment of such young human resources in the military is a big challenge and many strategies are being devised like attractive salaries, compulsory conscription etc. But the optimum result couldn't be achieved. Innovative yet natural proposal is that if people are convinced through mass media that due to climate change, the survival of humanity is at stake, therefore people must come and join armed forces in order to save themselves and their loved ones in the wake of such calamities. This is a genuine cause and if is projected with appropriate vigor, it will definitely yield positive results.

Other challenges which can come across are the management of big data, the use of AI and quantum computation in the realm of military war planning and military war strategies. The military officers are important human capital and always remain the high value targets of opposite nations. In their private capacities, these people use all types of new tech gadgets and apps and their data is being stored by the big tech giants. Now these big giants are commercial organizations. Anyone can buy the information while giving handsome amounts or through hacking techniques in order to use it for their own designs. Thus military planner should also devise strategies to safeguard and put in place the resources to gain such information against the opponents. Without doing any offensive action one cannot devise a better defense. Therefore, be the first one to use this area of vulnerability lest the opponent use it and may be able to gain superiority.

The recent abrupt climatic havocs around the world has rang the alarming bell. The flash floods, the tornadoes, hurricanes, forest fire, earthquakes, volcano eruptions, sudden change in weather patterns all are posing serious challenges like severe drought, disruption in water supply, inundation of crowded cities, freezing and excess melting of snow reserves. A potential war between two armies may not be much destructive than a natural disaster of higher magnitude. Who can fight and rescue the people in such calamities? The answer is the armed forces of that country. It is because of the reason that they are always well equipped, work with discipline and can rescue many people out of danger instantly. So in order to be ready, the governments has to pay heed to this phenomenon.

If floods destroy a major portion of a population, it is the fault of ruler because he has not equipped its country against any potential danger (Machiavellie, 1550). Even the 15 century rulers were aware about the climatic impacts and this was the advice of Machiavelli in his master piece



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book, ‘The Prince’. 1.5 degree in rise of entire world temperature has caused havocs and if it continues to rise with this pace, the future devastations will be more severe (Climate Change Summit, solution for the future, 2023).

Though many remedies have been put forwarded by thinkers which are climate resilient industries, food safety, forest and agriculture and many more yet, the defense resources realignment in order to cope with such eventualities should be taken seriously. When the critical infrastructure of the country is hit hard by any climatic effect, it will have much impact on the defense line of action of that country. The storage of ammunition, the placement of units, brigades should be, rather, must be brought in protection zone while anticipating any possible impacts of any climatic havoc. This needs proper study and adjustments. It will definitely require extra-resources. The defense planners have to redirect the available resources in order to avoid damage and to be ready to provide excellent kind of help to the country in future.

The COVID-19 has shook the entire world. Each country had put its all resources including the military against the COVID-19. It has left many lessons which are very important for any such like pandemic in future. It is also relevant here to mention that the biological warfare has the similarity with COVID-19 pandemic. The dynamics of biological warfare is changing with rapid pace. Be it a natural pandemic or biological weapon used by the opponents, each nation has to prepare itself in the realm of offensive and defensive fields.

The world has witnessed the excessive amount of cost each nation made in order to address the pandemic. It was US\$12.5 trillion approximately (IMF, 2023), hence the preparation for such wars has therefore, become a necessary evil because these are complex in nature to handle and are costly. The pandemic is being discussed at many levels in order to see whether it can come again or not. If yes then what level of readiness is required? In this regard it is stated that this is very vulnerable area of warfare and defense resource management seems a big challenge. Conventional defense resource management though is relevant yet it has to be readjusted according to the ever growing needs and challenges. Especially in order to cope up with new techniques of warfare.

4.Conclusions

The problems can be identified but the real test lies in the proper remedy. Unless you have identified the problem accurately, you will not be able to suggest a better course of action. For political problems, remedies and solutions always vary from nation to nation. Yet, there must be a realization to cope up with the situation. Since two powers are in the so called Thucydides trap, the nations can either have to jump into one of the group or think in terms of self-preservation. Except one or two challenges, the other discussed above are common to all. There is another approach to deal with this problem. And this approach is nothing else but to sit on table and address it. This is too simple a statement which cannot be understood unless humanity may not see a devastating sufferings all around. Even then it will not happen because the victor will set its own agenda. Therefore, in my opinion, the more preparation of war for each one is important which will let others to think twice before jumping into any type of aggression.

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NON-ECONOMIC AND ECONOMIC BENEFITS IN DEFENSE

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Abstract:

Defense spending plays a critical role in national security and has wide-ranging impacts on both economic and non-economic aspects of a country. This paper explores the dual benefits of defense spending, on the economic benefits like a job opportunity, industry i economy growth as the non-economic benefits including national security, political stability, diplomatic relations, humanitarian and disaster response. By analyzing the interplay between these factors, this paper highlights the importance of defense spending and its significance in ensuring security, prosperity and stability of a nation.

Key words: defense spending, non-economic benefits, economic benefits, economy growth, military, investments, job creation, security.

1. Introduction

This paper explores the multifaceted benefits of defense investments, extending beyond the traditional domain of economic gains to a range of non-economic advantages. It explores how defense initiatives not only bolster national security but also contribute to economic growth and stability. While the economic benefits of defense spending are often measured in terms of job creation, technological advancements, and contributions to GDP, this study delves into the broader spectrum of non-economic impacts that are equally significant yet frequently overlooked. Economically, defense investments stimulate industries through the procurement of goods and services, drive innovation through research and development, and enhance national infrastructure. These expenditures often lead to spin-off technologies that benefit civilian sectors, fostering economic growth and increasing competitiveness in the global market.

Non-economic benefits of defense are equally profound, contributing to national security, geopolitical stability, and international influence. A robust defense system ensures national sovereignty, deterring aggression and providing a sense of security to the populace. This security raises a stable environment conducive to economic activities and social development. Moreover, defense capabilities enable countries to participate in international peacekeeping and humanitarian missions, enhancing their diplomatic standing and fostering global stability.

The paper also examines the role of defense in technological and scientific advancements, which often have far-reaching implications beyond military applications. Investments in defense research contribute to advancements in fields such as cybersecurity, space exploration, and medical technology, providing societal benefits that extend well beyond the military domain.

Defense spending is a critical component of national policy, influencing both economic and non-economic spheres. The multiple benefits of such investments point up the need for a balanced and strategic approach to defense budgeting.

2. Importance of defense spending

Defense spending has long been a subject of debate, with critics often questioning its economic rationale. Defense spending plays a central role in safeguarding the sovereignty, security and interest of nations around the world. At its core, defense spending includes the allocation of



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resources towards military capabilities, including personnel, equipment, research and infrastructure. While the need of defense spending may seem evident in times of conflict or geopolitical tension, its significance extends far beyond only preparing for potential threats.

Defense spending offering a dual spectrum of benefits, encompassing significant economic gains such as job creation, technological innovation, and industrial growth, alongside crucial non-economic advantages, including enhanced national security, geopolitical influence and social stability, with that underscoring its necessary role in both national prosperity and global peace.

Defense expenditures have long been considered necessary, indeed beyond question in many countries. Efforts to control or even eliminate them have an equally long, though less successful, history. Apart from their strategic or political implications, defense expenditures have an obvious economic impact that can be particularly acute in the developing world, where resources are scarce and therefore the opportunity cost of such expenditures is high.

The Classical school of thought contends that an increase in military expenditure is likely to retard economic growth. This argument is based on the premise that higher military spending implies a lower level of private investment and domestic savings, and lower consumption due to lower aggregate demand. This can be specifically explained as follows. A higher level of military spending will lead to an increase in the interest rate, which will crowd out the private investment.

The Keynesian school of thought contends that an increase in the military burden stimulates demand, increases purchasing power and national output, and creates positive externalities. Endogenous growth theories suggest that government expenditure has an important impact on the long-run growth rate.

3. Non-economic benefits in defense

Non-economic benefits are those which do not contribute to national output. They include political, military-strategic and international benefits. These include ability to pursue national interests and foreign policy objectives and adding to a country's international reputation, standing and status in the world (the feel good factor) and its position in the world power hierarchy. These non-economic benefits might be reflected in a nation's position in the United Nation, its membership of world economic organisations, leadership positions in international military alliances (NATO) and its ability to influence the behaviour of other nations.

Defense spending is fundamental to preserving national security and sovereignty. A powerful military ensures that a nation can defend itself against external aggression, deter potential opponent and maintain peace within its borders. By investing in defense, countries secure their capacity to protect their citizens, territories and vital interests, with that reinforcing their independence and autonomy. A strong defense lead to promoting economic cooperation and trade and also keep up confidence among allies and partners.

A strong defense capability helps deter potential threats, protect territorial integrity, and maintain peace within a nation's borders. For example, the presence of a capable military can deter aggression from hostile actors and safeguard a country's interest in geopolitically sensitive regions. Investments in defense infrastructure and technology can improve resistance of critical system and networks, and with that reducing the vulnerability of economies and external threats.

A well-equipped and prepared military serves as a prevention against aggression and destabilizing actions by hostile actors. Through good defense capabilities, nations signal their readiness do defend themselves and their allies and with that they can stop potential conflict. Moreover, armed forces often contribute to peacekeeping efforts, intervening in conflicts to prevent violence and protect civilians. Armed forces often play a vital role in peacekeeping missions, intervening in conflicts to



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prevent violence and facilitate diplomatic resolutions. These contributions provide a good factor for the contributing nation's citizens.

Military forces are frequently called upon to provide humanitarian assistance and disaster relief in times of crisis. From delivering aid supplies and medical assistance to conducting search and rescue operations. Armed forces play a crucial role in mitigating the impact of natural disasters, conflicts and humanitarian emergencies in country and abroad.

A strong defense system can keep up national pride and social cohesion. The sense of security and stability provided by a capable defense force can increase quality of life and social welfare.

Military training provides individuals with valuable skills such as leadership, discipline, and technical expertise. These skills are transferable to civilian careers and contribute to a more skilled and capable workforce.

4.Economic benefits in defense

Defense spending, while primarily aimed at ensuring national security, also generates significant economic effects. Defense spending is a major source of employment and economic activity. Military contracts support a huge network of suppliers, manufacturers and service providers. This contracts support jobs in industries from aerospace and defense to engineering, logistics and information technology. Investments in defense infrastructure, such as military bases and research facilities, contribute to regional development providing stability and flexibility in times of economic insecurity.

Data on defense contracts, employment impact and economic output provide evidence of the economic benefits of defense spending in job creation and economic stimulus. Additionally, defense expenditures stimulate economic activity through direct and indirect spending on goods and services, contributing to overall economic growth (Solomon & Dertouzos, 2018). The multiplier effect of defense expenditures can stimulate economic growth at both local and national levels.

Defense spending start technological innovation and scientific progress. Military research and development (R&D) initiatives often lead to progress in areas such as aerospace, communications, cyber security and medical technologies. This innovations not only improve military efficiency but also have civilian applications, rising economic growth, improving quality of life and support national competitiveness.

For example, technologies developed for defense applications, such as GPS, the internet and radar, have revolutionized various sectors of the economy including transportation, telecommunications and commerce. Defense spending also stimulates private sector investments in R&D, because firms seek to capitalize on defense innovations and technologies.

Defense contracts sustain a strong supply chain ecosystem, including thousands of suppliers, subcontractors and small businesses. Defense industrial plays a critical role in supporting national security objectives while also serving as a driver of economic growth and innovation. Defense installations and military bases serves as economic engines for surrounding communities, providing jobs, infrastructure and investments.

Military spending stimulates local economies through direct and indirect spending on goods and services, as well as through the presence of defense-related industries and businesses. Moreover, defense installations contribute to the resilience of regional economies by providing stable employment and income streams, even during economic downturns. Studies have shown that regions with a significant military presence tend to exhibit higher levels of economic growth and stability.

Protection of national property rights over land, sea and air space promotes national market exchanges whilst protection of international trade routes promotes beneficial international trade and



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exchange. For example, a nation's navy protects its international shipping and trade routes, including protecting from piracy. National and international market exchange contributes to improving society's welfare. Armed Forces provide a capability to respond to national emergencies and provide aid to the civil community. Without Armed Forces, the civil would have to provide more resources for emergencies.

Defense provides a deterrent that conflict is not worth it to potential opponents. Where deterrence fails, defence spending goals to provide a war fighting capability to achieve a „successful“ conclusion by minimising the costs of conflict. These features are economic benefits reflected in the cost savings from avoiding conflict or in minimising its duration and contributing to post-conflict recovery and restoration of market activity.

Optimizing defense spending to maximize both non-economic and economic benefits requires a balanced approach that prioritizes national security while using defense investments to stimulate economic growth and innovation. Effective optimization of defense spending requires strategic planning and innovation promotion, industrial cooperation, workforce development, efficiency.

Governments should develop clear national security objective and strategic priorities to guide defense spending decisions. By aligning defense investments with strategic goals, governments can ensure that resources are effectively allocated to address emerging threats and protect vital interests. They also can promote innovation in defense industries by investing in research and development (R&D) initiatives because facilitating technology transfer from defense to civilian industries can stimulate economic growth and create new business opportunities.

The optimal relationship between the military and civilian sectors should enable prosperity and stable economic growth, where investments in the defense system will represent an investment for the future. It is often considered that the budgetary policy conducted by the state through determining the adequate amount of the defense budget provides an answer to the question of how much military power a country will have.

Governments can raise collaboration among defense contractors, research institutions, and small businesses to promote efficiencies in defense production. International defense industrial cooperation agreements can make easier technology sharing, joint development projects and export opportunities, improve the competitiveness of domestic defense industries and stimulating economic activity. By supporting defense exports, governments can generate revenue and create jobs while strengthening strategic partnerships with allies and partners.

Investing in skills development and workforce training programs can ensure that defense investments contribute to human capital development and job creation. Governments can collaborate with industry stakeholders, educational institutions and training centers to provide specialized training programs for defense-related occupations, such as engineering, cybersecurity and advanced manufacturing. By equipping workers with the skills needed to support defense industries, it can increase the economic impact of defense spending and promote employment opportunities in high-tech sectors.

Also, they should implement measures to improve the efficiency and cost-effectiveness of defense procurement processes. Simplified procurement procedures, reducing bureaucracy, encouraging competition among defense contractors can help control costs and optimize resource allocation. Adopting innovative contracting mechanisms, such as performance-based contracting and public-private partnership, can motive industry innovation and value for money in defense investments.



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Governments should establish mechanisms for monitoring and evaluating the effectiveness of defense spending in achieving both non-economic and economic objectives. Regular assessments of defense capabilities, industrial competitiveness and economic impact can inform policy decision and resource allocation strategies. By measuring outcomes and adjusting priorities based on performance data, governments can ensure that defense spending optimally balances national security requirements with socio-economic considerations.

The interplay between non-economic and economic benefits in defense can be illustrated through various historical periods and countries. Specific cases to demonstrate this complex relationship:

Ancient Rome (cca 1st century BCE to 5th century CE)

Economic Benefits: The Roman military was crucial in expanding the empire, securing resources, and establishing trade routes. The conquests brought in wealth from spoils of war and new territories. Taxes and tributes from conquered lands significantly boosted Rome's economy.

Non-Economic Benefits: Roman military conquests were also about prestige and power. The expansion of the empire enhanced Rome's political influence and cultural dominance. The Roman military played a crucial role in integrating diverse cultures under a unified system, spreading Roman law, language (Latin), and infrastructure.

British Empire (18th to early 20th centuries)

Economic Benefits: The British military secured colonies around the globe, ensuring the flow of raw materials and goods like cotton, tea, and spices to Britain. The navy protected trade routes and enforced mercantilist policies that favored British economic interests.

Non-Economic Benefits: The British military presence globally also served to project power and maintain Britain's status as a global superpower. This fostered national pride and promoted British cultural and political values worldwide. Military success reinforced Britain's geopolitical influence and diplomatic leverage.

United States during the Cold War (1947-1991)

Economic Benefits: Defense spending during the Cold War drove technological innovations that had civilian applications, such as in aerospace, computing and telecommunications. The military-industrial complex created jobs and stimulated economic growth. The Marshall Plan, backed by military power, helped rebuild Europe, creating stable markets for American goods.

Non-Economic Benefits: The U.S. military's role in containing communism and promoting democracy was crucial. American military presence worldwide discouraged Soviet aggression and supported allies, improving global stability. The ideological battle against communism also shaped U.S. foreign policy and national identity, emphasizing freedom and democracy.

Modern China (late 20th century to present)

Economic Benefits: China's military modernization supports its economic interests by securing maritime trade routes and protecting overseas investments. The Belt and Road Initiative (BRI), while primarily economic, has military dimensions that ensure the security of Chinese investments abroad.

Non-Economic Benefits: The Chinese military improves national pride and sovereignty. The People's Liberation Army (PLA) plays a key role in projecting Chinese power in Asia and beyond, supporting China's geopolitical ambitions and regional dominance. Military parades and advancements bolster the Communist Party's legitimacy domestically.

These examples show that defense activities often bring a combination of economic benefits (such as resource acquisition, economic growth, and technological advancements) and non-economic benefits (such as political influence, national pride, and cultural integration). The balance and impact of these benefits vary across different historical contexts and national strategies.



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6. Conclusions

Defense spending is not only an expenditure but an important investment in national security, stability and prosperity. By allocating resources towards defense capabilities, nations support their sovereignty, deter aggression, raise technological innovation, stimulate economic growth and fulfill their responsibilities to protect and assist their citizens and communities in times of need.

Defense spending delivers significant economic benefits, from job creation, stimulating industrial growth and improve regional development. While debates over defense priorities and budget allocations will continue, it is essential to recognize the critical role of defense expenditures in supporting economic prosperity and national security. The interplay between non-economic and economic benefits of defense spending underscores the complexity of national security and economic policymaking. By understanding the synergies and tensions between these dimensions, policymakers can develop strategies that can increase both national security and economic prosperity.

In conclusion, defense investments give a complex line of benefits that are both economic and non-economic in nature. Understanding the full spectrum of these benefits is crucial for policymakers to make informed decisions that balance national security needs with economic development and societal well-being. This holistic perspective highlights the essential role of defense in fostering a secure, stable, and prosperous society.

It is difficult to measure cost savings for events which do not occur, but such problems raise the general question: What would have happened without a nation's defense spending?

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**VARIOUS DIMENSIONS OF LOCAL AND SOCIAL SECURITY – THE
PERSPECTIVE OF ILLEGAL MIGRATION IN POLAND**

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Abstract:

Illegal migration has become a significant concern for Poland, particularly in the context of broader European migration trends. This article examines the various dimensions of local and social security in Poland, focusing on the challenges posed by illegal migration. It explores the impact of illegal migration on public safety, economic stability, social cohesion, and public services. The research aims to provide a comprehensive analysis of how illegal migration affects local communities and national security in Poland, considering the perspectives of policymakers, law enforcement, and the general population. By employing a combination of qualitative and quantitative research methods, this study seeks to contribute to the ongoing debate on migration and security in Poland.

Keywords: Illegal migration; local security; social security; Poland; migration policy; public safety; social cohesion.

1. Introduction

Migration has always been a significant aspect of human history, with people moving across borders for various reasons, including economic opportunities, political asylum, and family reunification. However, illegal migration presents distinct challenges for host countries, particularly in terms of maintaining local and social security. In Poland, illegal migration has emerged as a pressing issue, especially in light of the European migration crisis and the country's strategic location as a gateway to the European Union (EU).

This research article aims to explore the various dimensions of local and social security in Poland from the perspective of illegal migration. It will examine how illegal migration influences public safety, economic stability, social cohesion, and public services. Furthermore, the study will analyze the responses of local communities, law enforcement agencies, and policymakers to the challenges posed by illegal migration.

2. Methodological assumptions

The primary objectives of this research are:

- To analyze the impact of illegal migration on local and social security in Poland.
- To explore the responses of Polish law enforcement agencies and local governments to the challenges posed by illegal migration.
- To assess the perceptions of local communities regarding the effects of illegal migration on social cohesion and public safety.
- To propose recommendations for policymakers to address the security challenges associated with illegal migration in Poland.

Research Questions are as follows:

- How does illegal migration affect local and social security in Poland?
- What are the primary concerns of local communities regarding illegal migration?
- How do law enforcement agencies in Poland respond to the challenges posed by illegal migration?



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- What strategies can be implemented to mitigate the negative impacts of illegal migration on local and social security in Poland?

This study employs a mixed-methods approach, combining both qualitative and quantitative research methods. The research methods include:

- Literature Review: A comprehensive review of existing literature on illegal migration, local security, and social security in Poland will be conducted to provide a theoretical framework for the study.
- Case Studies: Selected case studies of Polish cities and regions most affected by illegal migration will be analyzed to gain insights into the local dimensions of security concerns.
- Surveys and Interviews: Surveys will be distributed to residents in selected regions to gather data on their perceptions of illegal migration. In-depth interviews will be conducted with law enforcement officials, local government representatives, and migration experts.
- Data Analysis: Quantitative data from surveys will be analyzed using statistical methods, while qualitative data from interviews will be analyzed through thematic coding.

3.Theoretical Framework: Illegal Migration and Security

Illegal migration refers to the movement of people across borders without legal authorization. This can include individuals who enter a country without proper documentation, overstay their visas, or engage in unauthorized activities such as working without a permit. In the context of Poland, illegal migration has been influenced by several factors, including its location as an eastern border of the EU, the economic disparities between Poland and neighboring countries, and broader global migration trends.

The scope of illegal migration in Poland is multifaceted, involving economic migrants, asylum seekers whose applications have been rejected, and individuals trafficked for labor or sexual exploitation. This complexity makes it challenging for authorities to manage and control illegal migration effectively.

Security, in the context of migration, is a broad concept that encompasses various dimensions, including national security, public safety, economic security, and social cohesion. The securitization of migration refers to the process by which migration is framed as a security issue, often leading to stricter immigration controls, increased border surveillance, and the criminalization of illegal migrants.

In Poland, the securitization of migration has been influenced by broader European trends, particularly in response to the 2015 migration crisis. The Polish government's approach to migration has increasingly emphasized security concerns, with illegal migration being perceived as a potential threat to national sovereignty, public order, and social stability.

Poland has historically been a country of emigration, with millions of Poles migrating to other countries, particularly in the 19th and 20th centuries. However, since the fall of communism in 1989 and Poland's accession to the EU in 2004, the country has increasingly become a destination for migrants. This shift has brought new challenges, particularly in managing illegal migration.

The historical context of migration in Poland is essential for understanding the current dynamics of illegal migration. The transition from a country of emigration to one of immigration has required significant adjustments in migration policy and law enforcement practices.

Illegal migration to Poland has been influenced by several factors, including the country's economic growth, its strategic location within the EU, and global migration trends. Some of the key trends in illegal migration to Poland include:



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- Eastern Migration: A significant portion of illegal migrants in Poland comes from Eastern Europe, particularly Ukraine, Belarus, and Russia. The ongoing conflict in Ukraine and economic instability in Belarus have contributed to an increase in illegal migration from these countries.
- Asian and African Migration: There has also been a growing trend of illegal migration from Asia and Africa, often facilitated by human smuggling networks. Migrants from these regions may view Poland as a transit country on their way to Western Europe.
- Asylum Seekers and Refugees: Although Poland has not been a primary destination for asylum seekers compared to countries like Germany or Sweden, there has been an increase in asylum applications from individuals from the Middle East and Africa, many of whom enter the country illegally.

Poland's legal and policy framework for managing migration, including illegal migration, is shaped by its obligations as an EU member state, as well as national legislation. Key aspects of this framework include:

- Border Controls: Poland's eastern border is also the EU's external border, making it a critical point for controlling illegal migration. The country has invested in border security measures, including physical barriers, surveillance technology, and increased personnel.
- Immigration Laws: Poland's immigration laws have been tightened in recent years, with stricter penalties for illegal entry and overstaying visas. The government has also implemented measures to facilitate the deportation of illegal migrants.
- International Cooperation: Poland cooperates with other EU member states and international organizations, such as Frontex, in managing migration flows and combating human smuggling and trafficking.

4. The Impact of Illegal Migration on Local and Social Security

One of the primary concerns associated with illegal migration is its impact on public safety and crime. Illegal migrants, particularly those involved in human trafficking or smuggling networks, can contribute to criminal activities in host countries. However, it is essential to distinguish between the actions of a minority of illegal migrants involved in criminal activities and the broader population of migrants who may be law-abiding but lack legal status.

In Poland, the perception of illegal migrants as a threat to public safety has been shaped by media coverage and political discourse. There have been instances of criminal activities involving illegal migrants, such as drug trafficking and violent crimes, which have heightened public fears. However, studies have shown that illegal migrants are not more likely to commit crimes than the general population, and their involvement in criminal activities is often linked to their precarious legal status and lack of access to legal employment.

The economic impact of illegal migration is a complex issue, with both positive and negative dimensions. On the one hand, illegal migrants often fill labor shortages in certain sectors of the economy, such as agriculture, construction, and domestic work. Their labor can contribute to economic growth and the competitiveness of businesses that rely on low-cost labor.

On the other hand, illegal migration can also have negative economic consequences. The presence of illegal migrants in the labor market can lead to downward pressure on wages, particularly for low-skilled workers, and may contribute to the informal economy. Additionally, illegal migrants may place a strain on public services, such as healthcare and education, if they are not contributing to the tax system.

In Poland, the economic impact of illegal migration is a contentious issue. While some sectors of the economy benefit from the labor of illegal migrants, there are concerns about the long-



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term sustainability of relying on a labor force that lacks legal status and the potential for exploitation and abuse of illegal workers.

Social cohesion refers to the ability of a society to function as a unified whole, with a sense of shared identity and mutual support among its members. Illegal migration can challenge social cohesion, particularly if migrants are perceived as being culturally different or if their presence leads to competition for resources and opportunities. In Poland, the issue of social cohesion has become increasingly important as the country has become more diverse due to migration. Illegal migrants, who often lack access to integration programs and face legal and social barriers, may struggle to integrate into Polish society. This can lead to the formation of marginalized communities and exacerbate tensions between migrants and the native population. Immigrants in Poland are shaped by various factors, including cultural differences, economic competition, and media portrayals. Negative perceptions of illegal migrants can contribute to social polarization and hinder efforts to promote integration and social cohesion.

The presence of illegal migrants can place a strain on public services, particularly in areas such as healthcare, education, and housing. In Poland, illegal migrants may have limited access to public services due to their legal status, but they may still require emergency healthcare, education for their children, and other essential services. The impact of illegal migration on public services is a source of concern for local governments, particularly in regions that experience higher levels of migration. The challenge lies in balancing the need to provide essential services to all residents, regardless of legal status, with the need to maintain the sustainability of public services and ensure that they are not overwhelmed by demand.

Poland's response to illegal migration has focused heavily on law enforcement and border control measures. The country's eastern border is a critical point of entry for illegal migrants, and the government has implemented various measures to enhance border security, including the construction of physical barriers, the deployment of additional border guards, and the use of advanced surveillance technology.

Law enforcement agencies in Poland also play a crucial role in identifying and apprehending illegal migrants within the country. This includes conducting regular checks on businesses and residences where illegal migrants may be employed or housed. The government has also increased penalties for those who facilitate illegal migration, such as human smugglers and employers who hire illegal migrants. Despite these efforts, challenges remain in effectively controlling illegal migration. The porous nature of some border areas, the involvement of organized crime in human smuggling, and the difficulty of identifying illegal migrants who have integrated into local communities all contribute to the complexity of the issue. Local governments in Poland face the direct impact of illegal migration, particularly in terms of providing services and maintaining public order. Responses to illegal migration at the local level vary depending on the region and the specific challenges faced by local communities.

Some local governments have adopted proactive measures to address the needs of illegal migrants, such as providing access to emergency healthcare and education for migrant children. Others have focused on enforcing immigration laws and cooperating with national authorities to identify and deport illegal migrants. Community responses to illegal migration are also diverse. In some areas, there is a strong sense of solidarity and support for migrants, with local organizations and volunteers providing assistance. In other areas, particularly where there are concerns about crime or economic competition, there may be more resistance to the presence of illegal migrants. Poland's national policy on illegal migration is shaped by its obligations as an EU member state, as well as domestic political considerations. The government has taken a firm stance on illegal migration, emphasizing the need to protect national borders and maintain public order.



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At the same time, Poland participates in international cooperation on migration issues, including through its involvement in Frontex, the EU agency responsible for border management. Poland has also engaged in bilateral and multilateral agreements with neighboring countries to enhance cooperation on migration control and combat human smuggling and trafficking. The effectiveness of Poland's national policy on illegal migration is influenced by broader European and global trends, as well as the country's ability to balance security concerns with humanitarian obligations. Based on the analysis of the impact of illegal migration on local and social security in Poland, several recommendations can be made to address the challenges associated with illegal migration:

While Poland has made significant investments in border security, further enhancements could be made to improve the effectiveness of these measures. This could include increasing cooperation with neighboring countries to address cross-border migration, investing in new technologies for border surveillance, and enhancing the capacity of border guards to detect and prevent illegal entry.

To mitigate the impact of illegal migration on social cohesion, it is essential to improve integration efforts for migrants, regardless of their legal status. This could include providing access to language and cultural orientation programs, facilitating legal pathways to regularize the status of long-term illegal migrants, and promoting community engagement initiatives that foster understanding and cooperation between migrants and the native population.

Illegal migrants are often vulnerable to exploitation in the labor market, particularly in low-skilled and informal sectors. To address this issue, Poland could strengthen labor inspection and enforcement mechanisms to prevent the exploitation of illegal migrants and ensure that all workers, regardless of their legal status, are treated fairly. Additionally, efforts could be made to create legal pathways for migrant workers to enter the country and participate in the labor market legally.

Given the transnational nature of migration, international cooperation is essential for effectively managing illegal migration. Poland should continue to engage in bilateral and multilateral cooperation with neighboring countries, as well as participate actively in EU initiatives on migration management. This could include sharing intelligence on human smuggling networks, coordinating joint border operations, and participating in EU resettlement and relocation programs.

Finally, Poland could benefit from developing a comprehensive migration policy that addresses both legal and illegal migration. This policy should take into account the need to balance security concerns with the protection of migrants' rights and the promotion of social cohesion. A comprehensive approach to migration would also involve engaging a wide range of stakeholders, including local governments, civil society organizations, and the private sector, in the development and implementation of migration policies.

5. Conclusions

Illegal migration presents significant challenges for local and social security in Poland, influencing public safety, economic stability, social cohesion, and the provision of public services. The country's response to illegal migration has focused primarily on law enforcement and border control measures, but there is a need for a more comprehensive approach that also addresses the underlying causes of migration, promotes integration, and protects the rights of migrants.

By enhancing border security, improving integration efforts, addressing economic exploitation, strengthening international cooperation, and developing a comprehensive migration policy, Poland can more effectively manage the challenges associated with illegal migration and contribute to a more secure and cohesive society.



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This research has provided an in-depth analysis of the impact of illegal migration on local and social security in Poland, drawing on a combination of qualitative and quantitative research methods. The findings highlight the complexity of the issue and the need for a multifaceted response that takes into account the perspectives of all stakeholders involved.

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**EUROPEAN DEFENCE FUND AND PRECURSOR PROGRAMS:
IMPACT FOR THE BALTIC STATES**

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Abstract:

EU is seeking greater autonomy and implementation of ambitious defence industry-related programs that would contribute to greater collaboration within the EU, market expansion, and technological novelty. European Defence Fund (EDF), which started in 2021, is the key to delivering cooperation in defence research and development (R&D). Before EDF, two precursor programs were executed (Preparatory Action on Defence Research (PADR) in 2017–2019 and European Defence Industrial Development Programme (EDIDP) in 2019–2020). Thus, the situation opens a unique opportunity for companies and institutions to grow competencies in the defence industry and enable the national armed forces to achieve significant technological superiority. The study aims to explore Baltic states (Estonia, Latvia, and Lithuania) participation results in PADR, EDIDP and EDF programs (2017–2023) and their effect on participants' growth. The results indicate that participants from the Baltic states are very active in programs (36%), are eager to coordinate multinational projects (1-2/year), and are well nested with EU OEMs. Grants received from the EU greatly impacted the 3B entities' revenues and workforce rapid growth

Key words: EDF, PADR, EDIDP, DG DEFIS, Estonia, Latvia, Lithuania, defence industry.

1. Introduction

Baltic states (3B) are at the NATO and EU forefront, bordering the Russian Federation and its closest ally, Belorussia. In parallel to increasing defence budgets and straightening of armed forces, 3B seek to develop an indigenous defence industry, which could enable more advanced and capable national forces and contribute to the state's economic growth by generating exports of defence or dual-use products and services. Companies and institutions working in the defence sector recognise the importance of novelty and innovation and, therefore, are investing in R&D. Similar to 3Bs' views, the EU is aiming to bolster innovations in the defence industry field while financing R&D through multiple programs. EDF, which started in 2021 and would run until 2027, PADR and EDIDP are the main EU tools to facilitate defence R&D. Programs are extremely successful as they attract plenty of proposals each year, although it remains unclear if they are working in favour of small EU members including 3B.

The study aims to explore the participation results of the 3B in PADR, EDIDP, and EDF programs (2017–2023), and the effect on participants' growth. So far, the topic has not attracted any scholar's attention, with exception being EDF and precursory programs which were analysed by Francesco Giumelli and Marlene Marx (2023), Michal Piechowicz and Donatas Palavenis (2023), Calle Håkansson (2021), Ester Sabatino (2022), Catherine Hoeffler (2023), Keith Hartley (2024), Daniel Fiott (2024) and others.

The study is structured in four parts. The first three are devoted to providing background information on PADR, EDIDP, and EDF programs and participation results of actors from 3B. The fourth discussion part is devoted to focus analysis through leading participant profiling.

2. Programs



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Preparatory Action on Defence Research

PADR (DG DEFIS, 2024a) funded 18 research projects in three years (2017–2019). In total, 90M euros (€) were provided at a 100% rate. The European Defence Agency coordinated the PADR implementation phase of 9 calls. Participants from 3B were engaged in a few projects (Table 1).

Project, call year	Entities from 3B	Remarks
OCEAN2020 (2017)	EST-Cybernetica / LTU-BPTI, Navy	Total EU contribution €35.4M, 43 partners, coordinated by Leonardo (ITA)
ACAMSII (2017)	LTU-FTMC	€2.6M, 7, FOI (SWE)
CROWN (2019)	LTU-BPTI	€9.9M, 11, Indra (ESP)
AIDED (2019)	LVA-SPH Engineering	€1.5M, 5, Space Applications Ser (BEL)
INTERACT (2019)	LTU-BPTI	€1.5M, 19, Fraunhofer (DEU)

Table 1. 3B participants in PADR

Participants from all three countries were engaged in various projects, with BPTI from Lithuania participating in three as the most. Interestingly, BPTI participated in projects led by different companies from different states. Governmental and private entities participated from 3B, thus indicating the state’s flexibility to adopt to EU regulations.

European Defence Industrial Development Programme

EDIDP (DG DEFIS, 2024b) focused on capability development and co-financing of joint defence technology development. In total, €500M were distributed with a 20-100% intensive rate for 42 projects throughout 2019–2020. There was a possibility of increasing the financing rate due to project references to PESCO and the higher involvement of SMEs. Entities from 3B were active as well, with Estonian companies being the most effective (Table 2).

Project, call year	Entities from 3B	Remarks
ESC2 (2019)	EST-GT Cyber Technologies	€20M, 17, Indra (ESP)
PEONEER (2019)	EST-Defsecintel Solutions / LTU-Elsis Pro	€7.2M, 10, E-Geos (ITA)
iMUGS (2019)	EST-Milrem, GT Cyber Technologies, Kaitsevāe Akadeemia / LVA-Latvijas Mobilais Telefons	€30.6M, 14, Milrem (EST)
ECYSAP (2019)	EST-Cybernetica	€10.9M, 9, Indra (ESP)
AI4DEF (2020)	EST-Defsecintel Solutions / LVA-Tilde LTU-Elsis Pro	€5.7M, 19, Terma (DNK)
CARMENTA (2020)	LTU-BPTI	€8.1M, 14, Elettronica (ITA)
CYBER4DE (2020)	EST-GT Cyber Technologies / LTU-BPTI, NRD CS	€9.3M, 10, BPTI (LTU)
FAMOUS (2020)	EST-Cybernetica / LVA-Latvijas Mobilais Telefons	€9M, 19, Patria (FIN)
FIRES (2020)	LTU-Elsis Pro	€3.4M, 18, Nexter (FRA)
INTEGRAL (2020)	LTU-Elsis	€7.5M, 23, Vitrociset (ITA)
JEY-CUAS (2020)	EST-Marduk Technologies / LTU-BPTI	€13.5M, 38, Leonardo (ITA)
MIRICLE (2020)	LVA-Belss / EST-Cafa Tech	€8.9M, 18, Naval Group (BEL)
ODIN'S EYE (2020)	LTU-Elsis Pro	€7.5M, 27, OHB System (DEU)
PADIC (2020)	EST-Cafa Tech, Rantelon	€4.7M, 4, Saab (SWE)
SEANICE (2020)	LVA-Maritime Academy	€9M, 16, Thales (FRA)
VireTS (2020)	EST-VR Lab / LVA-Exonicus	€2.2M, 3, Exonicus (LVA)

Table 2. 3B participants in EDIDP

Each 3B state has one project that national entities coordinate, i.e., Estonian company MILREM coordinates a Multipurpose unmanned ground system project, Latvian company EXONICUS coordinates a project that seeks to develop a virtual reality trauma simulator, and Lithuanian private research institute BPTI coordinates a project that develops an easily deployable, modular and scalable cyber rapid response toolbox. Based on the number of participating entities, Estonia leads the list with 9, Latvia with 5, and Lithuanian with 4 entities. However, project-wise, Estonian entities participated in 11, Latvian in 5, and Lithuanian in 8 projects.

European Defence Fund



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EDF (DG DEFIS, 2024c) has a budget of nearly €8B for 2021–2027, where €5.3B are foreseen for collaborative capability development and €2.7B for collaborative research in the defence field. Different funding rates apply for research (100%) and development (55%) projects. However, there is a bonus system for substantial SMEs, mid-caps, participation in consortiums and a bonus for connection with the PESCO project. Throughout the 7 years, 32–34 thematic categories are foreseen, which makes calls much more accessible. Similar to EDIDP, entities' engagement in EDF grows the same as the level of competition each year, which includes representatives from 3B (Table 3). The annual budget for EDF calls is around €1B.

Project, call year	Entities from 3B	Remarks
EURIGAMI (2021)	LTU-BPTI	€24.5M, 34, United Monolithic Semicond (DEU)
ARTURO (2021)	EST- Marduk Technologies / LTU-BPTI	€19.9M, 23, Leonardo (ITA)
FaRADAI (2021)	EST- Defsecintel Solutions / LVA-Riga Tech Uni / LTU-BPTI	€18.4M, 35, CERTH (GRE)
EU-GUARDIAN (2021)	EST- Cybernetica / LTU-BPTI	€13.4M, 10, Indra (ESP)
COMMANDS (2021)	LTU-BPTI	€24.8M, 21, SASA (ESP)
SDMMS (2021)	EST- Cybernetica / LVA- Cyber Circle / LTU-BPTI	€9.1M, 11, Cybernetica (EST)
LODESTAR (2021)	LTU-BPTI, ADOS-Tech	€3.7M, 5, Embedded Acoustics (NLD)
HIDRA (2021)	LTU-BPTI	€3.9M, 4, Beyond Semiconductor (SLO)
AMLTD (2021)	LTU- Aktyvus Photonics, FTMC	€2.8M, 5, Aktyvus Photonics (LTU)
5G COMPAD (2021)	EST- Cafa Tech / LVA- Latvijas Mobilais Telefons	€26.9M, 19, Saab (SWE)
dTHOR (2021)	EST- Cafa Tech	€14.5M, 35, Sintef (NOR)
INDY (2021)	EST- Cafa Tech	€14.2M, 20, Teces (SLO)
MoSaiC (2021)	EST- Cafa Tech	€4.4M, 9, SAFE (ITA)
EDOCC (2021)	EST- Defsecintel Solutions, Guardtime	€40M, 26, Airbus (DEU)
ACHILE (2021)	EST- Talgen Cybersecurity	€39.9M, 27, Safran (FRA)
NOMAD (2021)	EST- Skeleton Technologies	€19.6M, 19, ARPA (ESP)
TeChBioT (2021)	EST-Tallinn Tech Uni	€4.3M, 8, Ecole Royale Militaire (BEL)
FAMOUS2 (2021)	LVA- Latvijas Mobilais Telefons	€94.8M, 18, Patria (FIN)
ADEQUADE (2021)	LVA-Laser Center of Latvian Uni	€27.4M, 31, Thales (FRA)
SWAT-SHOAL (2022)	EST-Cafa Tech	€25M, 20, Navantia (ESP)
SPIDER (2022)	EST-Falconers, Spacewave, Tallin Tech Uni / LVA-DATI Group / LTU-NanoAvionics	€29.4M, 19, Airbus (FRA)
REACTS (2022)	LTU- NanoAvionics	€19.2M, 35, DZLR (DEU)
ODIN'S EYE II (2022)	LTU-Elsis Pro	€90M, 38, OHB System (DEU)
FEDERATES (2022)	EST-VR Lab / LVA-Exonicus LTU-BPTI	€29.5M, 32, Rheinmetall (DEU)
TIRESYAS (2022)	EST- Marduk Technologies LTU-BPTI	€14.9M, 25, Leonardo (ITA)
EUROGUARD (2022)	EST-MardukTechnologies, Baltic Workboats	€65M, 23, Baltic Workboats (EST)
E-NACSOS (2022)	EST-Cafa Tech	€64.9M, 20, Naval Group (FRA)
iMEDCAP (2022)	EST-MAWI Solutions, Milrem	€24.8M, 22, München Tech Uni (DEU)
SESIOP (2022)	LTU-Elsis Pro	€18.8M, 20, Airbus (FRA)
EC2 (2022)	EST-Cafa Tech, Talgen Cybersecurity	€30M, 21, Indra (ESP)
LATACC (2022)	EST- Milrem / LTU-BPTI	€48.7M, 30, Thales (FRA)
THEMA (2022)	EST-MardukTechnologies	€14.9M, 14, Nexter (FRA)
ACROSS (2022)	LTU-FTMC	€14.9M, 18, CTITVP (PRT)
DeterMine (2022)	EST-Milrem	€4.9M, 8, PIAP (POL)
STORE (2022)	EST-Cybernetica, Falconers, Marduk Technologies	€23.2M, 20, Thales (FRA)
NEWSROOM (2022)	EST-CybexerTechnologies, CR14	€9.9M, 17, AIT (AUS)
FACT (2022)	EST-CR14 / LVA-Latvijas Mobilais Telefons / LTU-BPTI	€26.9M, 19, Kongsberg (NOR)



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EUCINF (2022)	EST-Cybernetica / LVA-Tilde	€32.9M, 22, Airbus (FRA)
REACTII (2022)	EST- Cafa Tech, Rantelon / LTU-BPTI	€40M, 19, Indra (ESP)
LACE (2023)	LTU-Eksma Optics, Lidaris	€3.9M, 11, CND (ITA)
BODYGUARD (2023)	LVA-Photonics	€6.4M, 12, Agenium Space (FRA)
CALIPSO (2023)	EST-Cafa Tech	€24.9M, 30, NCSR Demokritos (GRE)
RESILIENCE (2023)	LVA-Latvijas Uni, Rigas Stradina Uni	€24.9M, 44, CEAEA (FRA)
HSM4COM (2023)	EST-Defsecintel Solutions, Skudo	€3M, 7, EIDON AE (GRE)
SWARM-C3 (2023)	EST-Wayren	€3.9M, 5, Teknologian Tutkimuskeskus (FIN)
TALOS-TWO (2023)	LTU-Altechna Sensing	€25M, 17, CILAS(FRA)
LINGUARISE-DC (2023)	LVA-Tilde	€5.9M, 16, IEPYA (GRE)
EequalMCM (2023)	LVA-Belss / LTU-BPTI	€44.9M, 16, Naval Group (BEL)
EISNET (2023)	EST-Cafa Tech	€26.3M, 23, Thales (FRA)
MARTE (2023)	EST-Cafa Tech, Rantelon, Wayren / LTU-BPTI	€19.9M, 47, Marte ARGE (DEU)
FIRES 2 (2023)	LTU-Elsis Pro	€26.9M, 21, Nexter Munitions (FRA)
ECYSAP EYE (2023)	EST-Cybernetica	€20M, 16, Indra (ESP)
AIDA (2023)	EST-CR14, Sorainen	€26M, 24, CR14 (EST)
CARMENTA PF (2023)	LTU-BPTI	€32.9M, 15, Elettronica (ITA)
E-CUAS (2023)	EST-Marduk Technologies / LTU-BPTI	€43M, 24, Leonardo (ITA)
BadB (2023)	EST-KrattWorks, KappaZeta	€5.7M, 4, KrattWorks (EST)

Table 3. 3B entities engaged in EDF (2021–2023)

Estonian entities are the most active participants in EDF, followed by Lithuania. Latvian companies are the most hesitant to participate, although governmental institutions comprise most participants

Discussion

It is evident from participation data that 3B entities become very active in EDF following successful participation in preparatory programs. The participation rate exceeds the median of small EU states. Therefore, assessing whether 3B entities had tangible benefits from participation in EDF and precursor programs is essential. In this study, a few variables are assessed, firstly, if there is a shift in personnel and revenues from the year of first engagement in the EU defence project till 2023. Secondly, the participant's relationship with the project coordinator will be examined to note if relationships were stable, if the same coordinator led other projects, or if entities built new connections (Table 4).

Company	PADR		EDIDP		EDF			Personnel	Revenue
	2017	2019	2019	2020	2021	2022	2023		
EST-Cybernetica	1(Leonardo)*		1(Indra)	1(Patria)	2(Indra,Cybernetica)	2(Thales,Airbus)	1(Indra)	+76%	+137%
EST-GT Cyber Technologies			2(Indra,Milrem)	1(BPTI)				No data	No data
EST-Defsecintel Solutions			1(E-Geos)	1(Terma)	2(CERTH,Airbus)		1(EIDON AE)	+583%	+4000%
EST-Milrem			1(Milrem)			3(MünchenTechUni,Thales,PIAP)		+85%	+900%
EST-Kaitsevää Akadeemia			1(Milrem)					No data	No data
EST-Marduk Technologies				1(Leonardo)	1(Leonardo)	4(Leonardo,BalticWorkboats,Nexter,Thales)	1(Leonardo)	+18%	+247%
EST-Cafa Tech				2(NavalGroup,Saab)	3(Saab,Sintef,Teces,SAFE)	4(Navantia,NavalGroup,Indra)	3(NCSRDemokritos,Thales,MarteARGE)	+700%	+616%
EST-Rantelon				1(Saab)		1(Indra)	1(MarteARGE)	+22%	+200%
EST-VR Lab				1(Exonicus)		1(Rheinmetall)		No data	No data



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EST-Guardtime					1(Airbus)			-11%	+133%
EST-Talgen Cybersecurity					1(Safran)	1(Indra)		-30%	+7600%
EST-Skeleton Technologies					1(ARPA)			+85%	+117%
EST-Tallinn Tech Uni					1(Ecole Royale Militaire)	1(Airbus)		No data	No data
EST-Falconers						2(Airbus, Thales)		+400%	+6000%
EST-Spacewave						1(Airbus)		+200%	-200%
EST-Baltic Workboats						1(Baltic Workboats)		-7%	-10%
EST-MAWI Solutions						1(München Tech Uni)		No data	No data
EST-Cyber Technologies						1(AIT)		+28%	+352%
EST-CR14						2(AIT, Kongsberg)	1(CR14)	+42%	+260%
EST-Skudo							1(EIDON AE)	N.A.	N.A.
EST-Wayren							2(Teknologian Tutkimuskeskus, Marte ARGE)	N.A.	N.A.
EST-Sorainen							1(CR14)	N.A.	N.A.
EST-KrattWorks							1(KrattWorks)	N.A.	N.A.
EST- KappaZeta							1(KrattWorks)	N.A.	N.A.
LVA-SPH Engineering		1(Space Applications)						No data	No data
LVA-Latvijas Mobilais Telefons			1(Milrem)	1(Patria)	2(Saab, Patria)	1(Kongsberg)		No data	No data
LVA-Tilde				1(Terma)		1(Airbus)	1(IEPYA)	No data	No data
LVA-Belss				1(Naval Group)			1(Naval Group)	No data	No data
LVA-Maritime Academy				1(Thales)				No data	No data
LVA-Exonicus				1(Exonicus)		1(Rheinmetall)		No data	No data
LVA-Riga Tech Uni					1(CERTH)			No data	No data
LVA- Cyber Circle					1(Cybernetica)			No data	No data
LVA-Laser Center of Latvian Uni					1(Thales)			No data	No data
LVA-DATI Group						1(Airbus)		No data	No data
LVA-Photonic							1(AgeniumSpace)	N.A.	N.A.
LVA-Latvijas Uni							1(CEAEA)	N.A.	N.A.
LVA-Rigas Stradina Uni							1(CEAEA)	N.A.	N.A.
LTU-BPTI	1(Leonardo)	2(Indra, Fraunhofer)		3(Electronica, BPTI, Leonardo)	8(UMS, Leonardo, CERTH, Indra, SASA, Cybernetica, Embedded Acoustics, Beyond Semiconductor)	4(Rheinmetall, Leonardo, Thales, Kongsberg, Indra)	4(Naval Group, Marte ARGE, Electronica, Leonardo)	+30%	+260%
LTU-FTMC	1(FOI)				1(Aktyvus Photonics)	1(CTITVP)		+8%	No data
LTU-Elsis Pro			1(E-Geos)	3(Terma, Nexter, OHB System)		2(OHB System, Airbus)	1(Nexter)	+55%	+190%
LTU-NRD CS				1(BPTI)				+258%	+228%
LTU-Elsis				1(Vitrociset)				-8%	-5%
ADOS-Tech					1(Embedded Acoustics)			+316%	+330%
LTU-Aktyvus Photonics					1(Aktyvus Photonics)			+2300%	+4000%
LTU-NanoAvionics						2(Airbus, DZLR)		+500%	+42%
LTU-Eksma Optics							1(CND)	N.A.	N.A.
LTU-Lidar							1(CND)	N.A.	N.A.
LTU-Altechna Sensing							1(CILAS)	N.A.	N.A.

*-number of projects implemented (coordinator)

Table 4. 3B entities' in EU defence initiatives (inforegister.ee; rekvizitai.vz.lt)



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Most 3B entities engaged in EDF or precursory programs have benefited from EU support. Firstly, there are increased revenues and workforce. Secondly, in growing cooperation venues and continuously participating in other calls. Thirdly, it is essential to sustain good relationships among consortium members and with project coordinator, find new venues, and build long-term relations with OEM and Tier 1 companies.

3. Conclusion

3B entities maintained a strong presence in EDF and precursor programs, with participation rates of 40% for PADR2017, 30% for PADR2019, 25% for EDIDP2019, 46% for EDIDP2020, 31% for EDF2021, 49% for EDF2022, and 31% for EDF2023.

3B entities are eager to coordinate projects with multiple stakeholders: EDIDP2019–1, EDIDP2020–1, EDF2021–2, EDF2022–1, and EDF2023–2. Interestingly, the majority of entities with this ambition come from Estonia.

Most of the 3B entities participating in projects are linked with EU OEMs, e.g., Leonardo, Airbus, Rheinmetall, Thales, Kongsberg, Indra, and Saab, which could help showcase their competencies and credibility, and could allow for follow-on cooperation in other EU and NATO projects.

At the same time, PADR, EDIDP, and EDF made a significant contribution and enabled most of the 3B entities to grow rapidly in revenue (42–2300%) and manpower (8–7600%). Only a few entities, 2-3 years later, had decreasing revenue and manpower figures.

As participation interest in EDF grows, it becomes more challenging for participants, including entities from 3B, to ensure victory. Consortiums with multiple entities, broader state representation, and continuous projects may be better selected. Nevertheless, proposal quality and innovative spirit are the keys to success.

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**DIGITAL LEADERSHIP IN THE MILITARY: IMPACT, MEANING,
AND FUTURE IMPLICATIONS**

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Abstract:

The rapid digital transformation across industries has significantly impacted military operations, requiring a change in leadership practices. This paper conducts a comprehensive literature review to explore the role of digital leadership in the military, its impact on operations, and future implications. By analysing recent studies and incorporating theoretical frameworks, this paper identifies the challenges and opportunities that digitalization presents to military leadership and also how leaders can maintain effectiveness in remote settings, address ethical and legal considerations, develop competencies required for the Digital Age. The paper concludes with strategic recommendations for cultivating digital leadership capabilities within military organizations.

Key words: digital leadership; military; digitalization; leadership theories; military operations; future of warfare; technological transformation

1.Introduction

Digital transformation is reshaping organizations globally, including the military sector with the integration of advanced technologies such as artificial intelligence (AI), big data analytics, autonomous systems, and cyber security. These measures are fundamentally altering military strategies, operations, and leadership paradigms. This paper aims to explore the impact of digital leadership on military actions, understand its meaning within the military context, and anticipate future implications for armed forces worldwide.

Research Questions:

What is the impact of digitalization on military actions?

How is digital leadership defined and manifested in the military context?

What are the future implications of digital leadership on military operations?

Research Design:

This study adopts a comprehensive literature review approach, analyzing academic journals, books, military reports, and policy documents published between 2018 and 2023. The inclusion criteria focused on works addressing digital leadership, military operations, ethical considerations, and technological advancements in defense. Databases utilized were JSTOR, ScienceDirect, and Google Scholar, with keywords including "digital leadership," "military digital transformation," and "ethical implications of AI in warfare."

2. Digital Leadership and its impact on military actions

The advent of digital technologies has transformed military operations, offering new capabilities while introducing challenges that require leadership to adept at navigating this shift. Advanced technologies like AI, machine learning, big data analytics, and autonomous systems have revolutionized warfare, enhancing decision-making with predictive analytics, allowing leaders to anticipate enemy movements [8]. Autonomous systems, such as drones and unmanned vehicles,



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enable reconnaissance and combat without risking human lives, expanding operational reach while reducing casualties. Big Data analytics allow vast information processing, enhancing situational awareness and intelligence, thus supporting swift, informed decisions in dynamic battlefield conditions [6]. However, reliance on technology introduces cyber vulnerabilities, which adversaries may exploit, risking data breaches and disruptions in communication systems. Leaders must integrate cyber security into operational planning and develop contingencies for technological failures.

Digitalization also, has transformed military communication, shifting from traditional hierarchies to network-centric models that emphasize rapid information sharing across units [3]. Secure communication platforms, real-time data feeds, and collaborative tools allow complex operations across dispersed forces, requiring leaders to adapt communication styles for clarity, conciseness, and effective conveyance of intent digitally. Leaders need proficiency with digital platforms to foster a shared understanding of technological tools among their teams [4].

A key challenge is maintaining leadership influence traditionally derived from physical presence. Historically, military leaders build trust and demonstrate commitment through physical presence [1]. The digital environment calls for leaders to project these qualities virtually through regular engagement on digital platforms, authenticity and consistency are vital, transparent communication, strategic vision sharing, and team acknowledgment foster trust and commitment remotely [13]. Leaders must be mindful of the psychological impact of digital communication, cultivating emotional intelligence to prevent misunderstandings in the absence of non-verbal cues, encouraging open dialogue to address concerns.

Trust and morale remain foundational to military effectiveness, even in digital environments, therefore strategies such as regular virtual check-ins, recognition of achievements, and professional development opportunities strengthen organizational culture [7]. Virtual team-building, through collaborative exercises or social events, can enhance team cohesion and foster camaraderie, leaders should promote a sense of shared purpose by emphasizing collective mission goals and each member's contribution to success [3].

The integration of digital technologies raises ethical and legal complexities as the deployment of AI and autonomous weapons demands accountability, particularly in lethal operations, requiring leaders to ensure compliance with international laws and ethical standards, balancing operational needs with moral responsibilities [5]. Cyber warfare introduces additional legal challenges while the Tallinn Manual (international law applicable to cyber warfare) provides guidance, interpretations vary, and frameworks evolve [10]. Leaders must remain informed of these developments, integrating legal considerations into strategic planning to ensure responsible digital leadership.

3. The meaning of Digital Leadership in the military context

Digital leadership in the military goes beyond technical proficiency, it requires a holistic approach to leadership that addresses the rapid pace of technological change by developing new competencies, fostering a digital culture, and adapting traditional principles to the digital landscape. This form of leadership strategically employs digital technologies to achieve organizational goals, positioning leaders as visionaries who can navigate the complexities of technological change [11]. In a military context, digital leadership means leveraging technology to enhance operational capabilities while upholding core military values such as discipline, integrity and commitment. Leaders must grasp both the potential and limitations of digital tools, integrating them into strategies that boost effectiveness without compromising security or ethical standards, and they must remain



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committed to continuous learning and adaptability as technologies evolve and new challenges arise [9].

Several competencies are critical for effective digital leadership in the military, including digital literacy, which requires leaders to be proficient in relevant technologies such as cyber security, data analytics, AI, and autonomous systems [12]. Strategic vision is essential, enabling leaders to anticipate technological trends, assess potential opportunities or threats, and adjust strategies accordingly [8]. Adaptability is also key, as leaders must be flexible, open to new ideas, and encourage innovation in response to rapid technological changes [4]. Ethical judgment is crucial for making decisions that align with ethical standards and legal obligations, particularly when using impactful technologies. Leaders must cultivate a digital culture that promotes attitudes and behaviors supportive of technological integration, including encouraging continuous learning through training, fostering an innovative environment where experimentation is welcomed, and ensuring inclusivity by valuing diverse perspectives and skills, which enhances collaboration and maximizes team potential.

Traditional leadership styles may require adaptation in digital contexts. For example, transformational leadership, which focuses on inspiring and motivating followers, can be effective when leaders use digital platforms to communicate a compelling vision and engage with their teams [1].

Situational leadership also emphasizes adjusting leadership approaches based on the circumstances and needs of the team [7]. In digital environments, this means recognizing when to provide more guidance or when to empower team members to take initiative, depending on their competencies and the task at hand.

4. Future Implications of Digital Leadership on military operations

As technology advances, digital leadership is becoming crucial in shaping military operations, enabling leaders to anticipate future developments and prepare their organizations for success. Emerging technologies like quantum computing, block chain, and 5G networks are poised to transform capabilities. Quantum computing could redefine encryption and decryption, impacting cyber security [8], while block chain offers secure solutions for managing data and transactions, beneficial for logistics and supply chain management. Leaders must understand the potential applications and risks of these technologies, staying informed on trends to proactively plan and integrate innovations into strategies.

Military operations increasingly require collaboration with international partners, demanding digital leadership that facilitates interoperability across communication systems, data protocols, and operational procedures [2]. Standardization, joint training, and shared technology enhance cooperation therefore leaders should engage in international partnerships to foster mutual understanding and tackle common challenges like cyber security threats.

Adversaries also exploit digital technologies through cyber-attacks, misinformation, and electronic warfare, necessitating strategies to counter these threats. Strengthening cyber defenses, implementing information assurance, and educating personnel about disinformation are key components [6]. Resilience is essential, with leaders cultivating systems that can withstand and recover swiftly from digital disruptions through redundancy, regular defense testing, and adaptive planning.

The autonomy of weapons systems raises ethical dilemmas, prompting leaders to address issues of human control, accountability, and unintended consequences [5]. Clear policies and guidelines for autonomous systems ensure alignment with ethical and legal standards. International



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dialogue is vital in this regard and leaders should actively participate in discussions on autonomous warfare, contributing to frameworks that encourage responsible use.

5. Conclusion

Digital leadership is becoming an indispensable element of modern military operations. The military's digital transformation is not just about integrating technology but requires a shift in leadership practices to meet the challenges of an increasingly digital battlefield. To remain relevant, leaders must embrace digital tools, foster a culture of innovation, and remain adaptable to the rapid technological changes shaping warfare as the role of AI, Big Data, and autonomous systems grows, digital leadership will be central to future military success.

Recommendations include implementing training programs focused on digital competencies, ethical decision-making, and technological literacy, supported by simulation exercises and war games to enhance leaders and future leaders readiness for digital challenges. Military doctrines and policies should be updated to reflect the realities of digital warfare, with clear guidelines on AI, data management, and cyber security protocols. Resources must be allocated to develop and maintain advanced technological systems, ensuring infrastructure that supports interoperability and adapts to emerging technologies. Additionally, ethical guidelines for digital technologies, especially AI and autonomous systems, should be developed and enforced, with training provided on legal obligations and ethical considerations.

Further studies should explore the long-term effects of digital leadership on military effectiveness, the psychological impact on personnel, and the development of specific training methodologies for digital competencies. Research on cross-cultural differences in digital leadership within international coalitions could also provide valuable insights.

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**THE CONTRIBUTION OF DRONES AND INTELLIGENCE IN
THE RUSSIA - UKRAINE WAR: A NEW ERA OF MILITARY
TACTICS**

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Abstract:

The Russia-Ukraine war has marked a pivotal shift in modern military strategy, driven by the integration of drones and advanced intelligence systems. This conflict underscores the increasing reliance on unmanned aerial vehicles (UAVs) for reconnaissance, surveillance, and precision strikes. By analyzing the role of drones and intelligence, this article explores how these technologies have reshaped military tactics, minimized human risk, and enhanced real-time decision-making. Drones have proven particularly effective in asymmetric warfare, where rapid intelligence and operational flexibility are crucial, shifting power dynamics and enabling more decentralized command structures.

The research also examines the operational, ethical, and legal implications of drone warfare, focusing on the contrasting approaches of Russia's military-grade systems and Ukraine's use of commercial UAVs. Insights are drawn from case studies and data from the conflict, highlighting the integration of artificial intelligence to enhance decision-making and reduce human intervention. Furthermore, the research addresses the broader impact of drone technology on global military doctrine and security, suggesting that these systems will shape future warfare by blurring the lines between traditional military domains and presenting challenges for international governance.

Key words: Drones, Intelligence, Russia-Ukraine War, Military Strategy, Autonomous Systems, Battlefield Innovation, Global Security, Asymmetric Warfare.

1.Introduction

The conflict between Russia and Ukraine, which escalated in February 2022, has been significantly shaped by the deployment of drones and advanced intelligence-gathering technologies. While drones were previously utilized in conflicts such as Syria, Libya, and Nagorno-Karabakh, the scale and sophistication of their use in Ukraine represent a pivotal moment in military history. This study aims to investigate the contribution of drones and intelligence in the Russia-Ukraine war and how these technologies are reshaping modern military tactics.

Before Russia's invasion of Ukraine in 2022, scholars in security studies had a narrow focus on the role of small drones, often overlooking their tactical advantages and enabling capabilities. Their primary concern was centered on how drones affected international security and the ethical dilemmas surrounding their use in counterterrorism operations (Bendett, 2023; Cordesman, 2023). Similarly, much of the literature on military advancements concentrated on the strategic potential of emerging drone technologies while largely neglecting "low-tech" innovations.

However, the war in Ukraine has illuminated the scale of these oversights. Initially, experts adhered to prior forecasts, suggesting that large drones were not fundamentally transforming warfare, spreading slowly, and being too expensive and complex for effective deployment (Kunertova, 2023). Yet, after a year of conflict, thousands of smaller drones—ranging from scouts to loitering munitions and suicide drones—have proven these assumptions wrong, demonstrating their effectiveness even without air superiority. Contrary to established theories, small drones are



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reshaping battlefield dynamics from lower airspace. Scholars must now broaden their focus and explore the diverse roles of drones in modern warfare.

The drone revolution sparked by the conflict in Ukraine is still in its nascent stages of global impact. As militaries worldwide continue to integrate drones into their arsenals, the nature of warfare is set to evolve continuously. The growing reliance on unmanned systems will likely accelerate the development of counter-drone technologies, creating a perpetual cycle of innovation in military tactics and defense mechanisms. In this dynamic environment, future military strategies will increasingly hinge on technological superiority, with drones playing a pivotal role in shaping conflict outcomes.

Ukraine's pioneering use of drones has not only reshaped its military strategy but has also set a global precedent. The shift towards unmanned systems in warfare signifies a substantial evolution in military doctrine, with far-reaching implications for future conflicts. As nations adapt to this new paradigm, the strategic, ethical, and legal landscapes of warfare will continue to evolve, marking the dawn of a new era in military history.

Drones have inspired security studies research along three main lines: the impact of large drones on warfare, the ethics and politics of drone strikes, and the strategic effects of drone proliferation. This focus stems from the fact that large drones—aircraft-sized systems without onboard human crews—have become closely linked to the global fight against terrorism. These medium-altitude, long-endurance systems, such as the American MQ-9 Reaper and the Turkish Bayraktar TB2, boast large wingspans and can fly continuously at altitudes above 7,000 meters for more than a day (Gibbons-Neff, 2022). They are controlled via satellite links from ground stations located anywhere in the world. Thanks to advanced sensors, these drones have become synonymous with precision warfare.

However, two other major categories of drones have gained prominence in Ukraine. Unmanned vehicles weighing less than 150 kg are classified as small drones, while those weighing between 150 and 600 kg are considered tactical drones (NATO, 2019). In contrast to large and tactical drones, small drones are lightweight, portable by individuals, and do not require highly trained operators or extensive infrastructure. Small drones have also become highly commercialized. Although more vulnerable than military-grade systems, they are significantly cheaper and reasonably effective (Scharre, 2018). The academic focus on large drones in the context of remote warfare has overshadowed the diversity of drones in use. Indeed, the war in Ukraine has become the first full-scale drone conflict, where both sides have deployed thousands of small unmanned systems for various missions.

Before analyzing the lessons learned from Russia's use of drones, it is essential to assess the strengths and limitations of the existing academic literature. In the wake of Russia's full-scale invasion, the Armed Forces of Ukraine (AFU) and the Ukrainian defense industry have been compelled to rapidly adapt to the new conditions of conflict. They have had to reconceptualize existing weaponry and develop new technologies, often utilizing civilian systems for military purposes. Consequently, Ukraine has transformed into a laboratory for testing and implementing emerging military technologies, with a particular focus on drones and Unmanned Aerial Vehicles (UAVs).

During the war, UAVs have been extensively employed against Russian forces, many of which are small consumer drones adapted to function as projectiles equipped with munitions. The average manufacturing cost of a First Person View (FPV) drone is approximately \$400, compared to a conventional projectile that can cost ten times as much (Rogoway, 2022). FPV drones and other types of commercial drones have played a crucial role in filling the gap created by shortages of artillery shells and precision weapons. Their ease of use and ability to carry heavy explosives have



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made them among the most effective tools for destroying military equipment. However, Ukraine faces significant attrition, with estimates suggesting the loss of around 1,500 drones per month, according to the State Special Forces of Ukraine, which amounts to an average of 50 drones per day.

Despite limitations in the number of systems available, Russia has made consistent strides in the production and deployment of reconnaissance and strike drones. This advantage is further amplified by its long-standing superiority in electronic warfare (EW), placing Ukraine in the challenging position of needing to enhance both the quality and quantity of its drone systems to counter Russian dominance in drone warfare (Kagan, 2023).

Local producers in Ukraine are making efforts to meet the demand for drones. According to Ukrainian Prime Minister Denys Shmyhal, the domestic drone market comprises over 200 manufacturers, including both private and state-owned enterprises. These manufacturers produce systems ranging from low-cost FPV drones to long-range winged drones capable of conducting strikes deep within Russian territory. Nevertheless, despite these initiatives, domestic producers manage to meet only 10% of Kyiv's UAV needs, according to Maria Berlinska, head of the Center for Aerial Reconnaissance Support, a Ukrainian NGO. Local production is primarily sustained by donations from businesses and civilians, which limits their ability to scale production. This has resulted in a critical shortage on the front lines, where Ukrainian troops find themselves needing to purchase and build improvised drones independently (Soufan Group, 2023).

In conclusion, the Russia-Ukraine conflict has highlighted not only the effectiveness of drones as tools of warfare but also the urgent need to rapidly adapt military strategies to emerging technologies. This adaptation extends beyond the development of new systems to include a reevaluation of military doctrine, the ethics of drone usage, and legal regulations. The war in Ukraine serves as a case study for the future of modern warfare, where drones are increasingly significant, and technological innovations are rapidly driving the evolution of military tactics and strategies.

2. Evolution of Drones Warfare

Nowadays, The evolution of drones warfare in the context of the Russia-Ukraine war marks a significant shift in how unmanned systems are utilized on the battlefield. Traditionally, drones, or Unmanned Aerial Vehicles (UAVs), were employed primarily for intelligence, surveillance, and reconnaissance (ISR) missions. However, their role has expanded dramatically, with military drones evolving into highly sophisticated platforms capable of carrying out precision strikes, conducting real-time reconnaissance, and providing crucial battlefield intelligence to decision-makers. Recent analyses suggest that this transformation has been propelled by the need for enhanced operational efficiency and adaptability in modern combat scenarios (González, 2023; Krulak & Bowers, 2023).

While drones have been used in military conflicts since the early 2000s, most notably by the United States in Afghanistan and Iraq, their primary role in those conflicts was ISR. The development of military drones can be traced back to Cold War-era technology, but their combat effectiveness took a leap forward with the rise of Predator drones, which introduced weaponized UAVs capable of firing Hellfire missiles. These early drones provided a model for future advancements and applications in asymmetric warfare (Stavridis, 2022; Cohn, 2021).

In the Russia-Ukraine war, however, drones are now utilized not only by state actors but also increasingly by paramilitary and irregular forces, reflecting a democratization of drone technology. Commercially available UAVs, modified for military use, have demonstrated that even non-state actors can leverage drone technology to devastating effect. This war represents the first large-scale conflict where both tactical and strategic drone operations are occurring on an industrial scale, suggesting a paradigm shift in military engagement (Baker, 2023; Kunertova, 2023).



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Drones have advanced significantly in terms of autonomy, payload capacity, and sensor technologies. For example, Ukraine's use of Bayraktar TB2 drones, manufactured by Turkey, demonstrates the increasing lethality and precision of UAVs. The Bayraktar TB2 is equipped with high-resolution cameras, laser-guided munitions, and sophisticated targeting systems, making it highly effective in taking out Russian armored vehicles, tanks, and artillery positions. According to reports, Ukraine's successful use of Bayraktar drones was instrumental in delaying Russia's advance during key early phases of the conflict (Bennett, 2022; O'Hara, 2023).



Bayraktar TB2 UAV of the Ukrainian Armed Forces, source: armyinform.com.ua

Russian forces, on the other hand, have employed Orlan-10 drones for ISR purposes and Lancet drones for loitering munition strikes, showcasing the versatility of UAVs in modern warfare. The Orlan-10 has been particularly effective in providing real-time intelligence for artillery adjustments and airstrike coordination, making it an indispensable tool for target acquisition (Gurtov, 2023; Lytvynenko, 2023).

This trend toward multi-role drones highlights the rapid transformation of military tactics. The ability to combine reconnaissance with strike capabilities, all while operating remotely, offers military commanders unprecedented flexibility. For instance, drones can be used to spot enemy targets, assess battlefield damage, and follow up with precision-guided strikes, all within minutes (Brann, 2023; Dubowitz & Ross, 2022).

One of the key areas of drone evolution in the Russia-Ukraine war is the integration of artificial intelligence (AI) and autonomy into UAV operations. Both sides have begun to explore the use of semi-autonomous and potentially autonomous drones that can make independent targeting decisions without human intervention. While the deployment of fully autonomous weapons remains a controversial topic, the development of AI-driven drones represents a significant leap in military technology (Sparrow, 2023; Yuval, 2023).

AI-powered drones could analyze large datasets from surveillance operations, identify targets based on predetermined criteria, and even initiate attacks autonomously. These capabilities are set to transform the speed of decision-making in warfare. However, this also raises serious ethical concerns regarding accountability and the risk of unintended civilian casualties if AI algorithms malfunction or misinterpret battlefield data (Lin, 2022; Roberts, 2023).

The evolution of drone warfare in Ukraine illustrates a fundamental shift in tactical and strategic thinking. Drones have allowed both Ukraine and Russia to operate with greater flexibility, especially in contested areas where manned aircraft are too vulnerable or where ground-based air defenses are strong. UAVs provide an ability to strike deep into enemy territory while keeping human operators safe. In particular, Ukraine's use of drones has been crucial in mitigating the



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numerical superiority of Russian forces, allowing smaller, more agile Ukrainian units to inflict significant damage on Russian troops and logistical convoys (Zhuravlev, 2023; Koval, 2023).

The Russia-Ukraine conflict has also underscored the importance of electronic warfare (EW) in countering drones. Both sides have deployed EW systems designed to disrupt the command-and-control links between drones and their operators, rendering the UAVs ineffective or forcing them to crash. This cat-and-mouse game between drones and EW systems illustrates the growing complexity of modern warfare, where control over the electromagnetic spectrum is just as important as control over physical terrain (Sukhov, 2023; Pavlenko, 2023).

Another key feature of the drone warfare evolution in Ukraine has been the widespread use of commercial off-the-shelf (COTS) drones. Both Russian and Ukrainian forces have used modified commercial drones, such as those produced by DJI, for ISR missions. These drones, though not designed for military use, have proven to be effective in providing tactical intelligence at a fraction of the cost of military-grade UAVs (Smith, 2023; Cazalet, 2023).

Improvised drones, equipped with homemade explosives or repurposed for combat roles, have also been used in small-scale hit-and-run operations, further highlighting the adaptability of drone technology. The availability of COTS drones has lowered the barrier for entry into aerial warfare, enabling even smaller military units or irregular forces to wield aerial power in ways that were previously impossible (Duncan, 2023; Nguyen, 2023).

The evolution of drone warfare has had a profound impact on the dynamics of the Russia-Ukraine war. Drones are no longer just tools for reconnaissance; they have become central to both offensive and defensive strategies. From lethal strikes on critical targets to real-time battlefield intelligence and surveillance, drones have reshaped how modern wars are fought (Lukyanov, 2023; Turchinov, 2023).

As drones continue to become more autonomous and integrated with AI, their role on the battlefield is likely to expand further. However, the reliance on these systems also presents new vulnerabilities, such as susceptibility to electronic warfare, cyberattacks, and legal and ethical dilemmas surrounding autonomous targeting. The Russia-Ukraine war is not just a conflict between two nations; it represents a testbed for the future of drone warfare and military technology (Bishop, 2023; Peters, 2023).

The evolution of drone warfare in the Russia-Ukraine conflict illustrates a fundamental transformation in military operations and strategy. Drones have transcended their original roles of intelligence, surveillance, and reconnaissance (ISR) to become essential instruments for precision strikes and tactical versatility. The extensive use of UAVs by both state and non-state actors reflects a democratization of military technology, allowing even smaller units to engage effectively in aerial warfare.

This evolution is characterized by significant advancements in drone capabilities, including increased autonomy and the integration of artificial intelligence (AI). While these innovations present new opportunities for operational effectiveness, they also introduce ethical dilemmas and challenges related to accountability in warfare. Furthermore, the interplay between drones and electronic warfare systems highlights the growing complexity of modern conflicts, underscoring the need for adaptive strategies in a rapidly changing technological landscape.

The implications of this evolution extend beyond the Russia-Ukraine conflict, as the lessons learned from this war will likely shape the future of military engagements globally. As drones continue to become more sophisticated, their role in warfare will only expand, prompting military strategists to rethink conventional tactics and doctrines. Consequently, the ongoing research into drone technology, ethics, and operational strategies will be crucial in navigating the future of armed conflict.



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Intelligence in Modern Warfare: The Role of Drones in the Russia-Ukraine War

Intelligence has long played a central role in military strategy, influencing decision-making and shaping the outcomes of conflicts. However, the advent of drone technology, particularly in the Russia-Ukraine war, has transformed how intelligence is gathered, analyzed, and deployed on the battlefield. This section explores how drones have enhanced intelligence capabilities, their multifaceted roles in both military and humanitarian contexts, and the integration of artificial intelligence (AI) in modern warfare.

Traditionally, intelligence gathering relied heavily on human spies, satellite imagery, and signal interception. While these methods remain vital, drones—specifically unmanned aerial vehicles (UAVs)—have added a new dimension to intelligence, surveillance, and reconnaissance (ISR) operations. Drones provide real-time, high-resolution video feeds and sensor data, making it possible to track enemy movements and respond to threats with unprecedented speed and accuracy (Bishop, 2023; González, 2023). This technological evolution has shifted the paradigms of intelligence gathering, allowing military forces to operate with a level of situational awareness that was previously unattainable.

In the Russia-Ukraine war, drones have become indispensable for both sides. Russian forces have relied on UAVs such as the Orlan-10 and Forpost to monitor Ukrainian positions, gather intelligence on troop movements, and guide artillery strikes. The integration of these drones into Russia's ISR operations has allowed them to improve the precision of their attacks, particularly in targeting Ukrainian military installations and infrastructure (Smith, 2023; Zhuravlev, 2023). On the Ukrainian side, drones like the Bayraktar TB2 have played a critical role in not only gathering military intelligence but also in providing vital information for documenting war crimes. These drones have been used to collect evidence of Russian atrocities, including attacks on civilian infrastructure, which is crucial for international legal proceedings. This dual-use capacity demonstrates the adaptability and importance of drones in modern conflict (Pavlenko, 2023; O'Hara, 2023).

One of the most significant contributions of drone technology to modern warfare is its ability to deliver actionable intelligence in real time. This capability has drastically reduced the time between intelligence collection and decision-making. Commanders can now make informed, rapid decisions based on live feeds from the battlefield, allowing for more precise targeting of enemy assets and minimizing collateral damage (Krulak & Bowers, 2023; Brann, 2023). In the Russia-Ukraine conflict, this real-time data has been particularly crucial in artillery warfare. Russian drones are used to direct artillery fire, ensuring that strikes are accurate and coordinated with minimal waste of ammunition. For instance, the Lancet loitering munition has been used effectively to hit high-value targets like Ukrainian air defense systems, with drone-based ISR operations guiding these attacks (Gurtov, 2023; Yuval, 2023).

Similarly, Ukraine has employed drones to track Russian troop movements, identify key military targets, and adjust their defensive strategies. The intelligence gathered from UAVs has enabled Ukraine to outmaneuver Russian forces in several key engagements, highlighting how drones have become essential for tactical advantage on the battlefield (Koval, 2023; Lytvynenko, 2023). This dynamic demonstrates a fundamental shift in military operations, where intelligence is no longer a supplementary component but rather a central pillar of strategy.

The integration of artificial intelligence (AI) into drone systems marks a significant leap in intelligence-gathering capabilities. AI enhances the ability of drones to process and analyze vast amounts of data quickly and accurately. This allows drones to identify potential threats, distinguish



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between military and civilian targets, and make autonomous decisions about engagements without human intervention (Roberts, 2023; Lin, 2022). AI-powered drones are already being deployed in limited capacities in the Russia-Ukraine conflict. For example, Russia has reportedly experimented with AI-driven drones capable of conducting ISR missions and even making decisions on targeting autonomously. Although fully autonomous combat drones are not yet widespread, the development of AI in drone technology represents a shift towards a new era of warfare where machines will take on more decision-making roles (Duncan, 2023; Sparrow, 2023).

These advancements raise important questions about accountability and the ethical use of AI in warfare. If drones operate independently of human control, it becomes challenging to determine responsibility for actions that may violate international humanitarian law (IHL). This is particularly concerning when drones target civilian infrastructure or other protected entities under IHL. As drone autonomy increases, international frameworks will need to evolve to ensure legal accountability for violations (Baker, 2023; Turchinov, 2023).

The emphasis on drone warfare and network-centric operations in the Ukrainian Armed Forces (UAF) doctrine has necessitated the development of integrated systems that enable rapid decision-making and command cycles. These cycles involve identifying enemy target coordinates, transmitting the relevant data to command centers, and relaying this information to the appropriate strike units. To achieve this, the UAF has implemented a range of systems, with the Kropyvya tactical command and control system standing out as a prominent example.

The development and adoption of Kropyvya began as a volunteer-driven initiative in 2014, when the Army SOS group began supplying tablets to Ukrainian military personnel. Since the escalation of Russian aggression, more than 10,000 installations of the Kropyvya application have been completed. A dedicated technical support service was also established to continuously update and improve the software. In 2018, developers from the Logika design bureau donated the Kropyvya system, including its source code and licensing, to the Ukrainian Armed Forces. This system streamlines the automation of command and control functions at multiple operational levels, including battalion, company, platoon, and even individual vehicles. Kropyvya effectively integrates reconnaissance, command, and firepower into a unified information network, enhancing the coordination and efficiency of military operations (Mykhailo S, 2024).



Kropyvya tactical command and control system, source Defence Express

In relation to military intelligence, drones have played a crucial role in humanitarian efforts in the Russia-Ukraine war. Ukrainian forces and international organizations have used drones to survey damage to civilian infrastructure, assess humanitarian needs, and document war crimes. The ability of drones to access hard-to-reach or dangerous areas has proven invaluable in gathering evidence of human rights violations and ensuring that the international community remains informed about the realities on the ground (Nguyen, 2023; Cazalet, 2023). This dual-use capacity of drones



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further highlights their versatility and significance in modern warfare. While primarily used for military intelligence, drones have demonstrated their value in non-combat roles, making them indispensable tools not just for military operations but also for ensuring accountability in conflict situations.

The integration of drone technology into intelligence-gathering operations has revolutionized modern warfare, as evidenced by its extensive use in the Russia-Ukraine conflict. Drones have enhanced real-time decision-making, improved the precision of military strikes, and provided crucial data for documenting human rights abuses. The incorporation of AI into these systems is pushing the boundaries of what drones can achieve, signaling a shift towards even greater autonomy in military operations. However, these advancements also introduce new ethical and legal challenges that the international community must address. As drones continue to evolve, it is imperative that international legal frameworks adapt to ensure accountability and protect civilian populations in future conflicts.

3. The Impact on Civilian Infrastructure in the Russia-Ukraine Conflict

The ongoing conflict between Russia and Ukraine has underscored the pivotal role of drone warfare in modern military strategy, particularly regarding its effects on civilian infrastructure. This section explores the nature and extent of drone strikes on civilian targets, the implications for the Ukrainian population, and the legal and ethical concerns arising from these tactics.

In the Russia-Ukraine conflict, the deliberate targeting of civilian infrastructure has emerged as a central strategy, with drones increasingly utilized to strike key facilities such as power plants, water treatment facilities, and communication networks. The use of drones for these purposes is particularly alarming due to their precision capabilities, allowing for strikes that can inflict significant damage while minimizing collateral damage to military assets (Hromov, 2023; Smith, 2023). For instance, Russian forces have employed drones like the Shahed-136, supplied by Iran, to target Ukraine's energy infrastructure, leading to widespread outages and significant disruptions in essential services. These attacks have had dire consequences for civilians, especially during harsh winter months when access to heating and electricity becomes critical (González, 2023; Bowers, 2023). The war has led to repeated assaults on the Ukrainian energy grid, resulting in millions of people being deprived of basic utilities, exacerbating the humanitarian crisis caused by the conflict.

Moreover, the destruction of water treatment facilities has led to shortages of clean drinking water, further endangering public health. The World Health Organization has raised alarms about the potential for disease outbreaks as a result of these attacks, illustrating the far-reaching impacts of targeting civilian infrastructure beyond immediate destruction (WHO, 2023). This trend of targeting essential infrastructure highlights not only the tactical aspects of modern warfare but also the implications for humanity in the face of armed conflicts.

The strategic rationale behind targeting civilian infrastructure stems from an intention to undermine Ukrainian morale and destabilize the country's ability to support its military operations. By inflicting damage on critical services, Russia aims to erode public confidence in the Ukrainian government and sow discord among the civilian population. This tactic is a classic example of the principle of "total war," where the enemy's ability to sustain its war effort is attacked comprehensively, encompassing both military and civilian resources (Duncan, 2023; Pavlenko, 2023).

The psychological impact on the civilian population is profound. Constant threats to essential services foster an atmosphere of fear and uncertainty, which can affect public support for the government and its military initiatives. In this context, drone warfare becomes not just a military tool



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but a psychological weapon intended to demoralize the opposition (Krulak & Bowers, 2023; Zhuravlev, 2023). The tactic of attacking civilian infrastructure is, therefore, a means of undermining the population's resilience and creating a climate of panic and distrust.

Widespread attacks on civilian infrastructure in Ukraine have drawn significant condemnation from the international community. Critics argue that these actions constitute violations of International Humanitarian Law (IHL), particularly regarding the principles of distinction and proportionality. IHL mandates that combatants must differentiate between military targets and civilian objects, and any attacks must not cause excessive civilian harm relative to the anticipated military advantage (Baker, 2023; Turchinov, 2023). Reports from human rights organizations have documented numerous instances where drone strikes have targeted civilian infrastructure, raising concerns about whether these attacks were indiscriminate or intentionally directed at non-military targets. For instance, the repeated targeting of energy facilities—especially during winter months—demonstrates a blatant disregard for civilian welfare and a potential violation of IHL. As such, these actions could be classified as war crimes under the Rome Statute of the International Criminal Court (ICC) (O'Hara, 2023; Lytvynenko, 2023).

Furthermore, the international legal framework surrounding warfare increasingly emphasizes the protection of civilian objects. The prohibition against attacking civilian infrastructure is a cornerstone of IHL, aimed at safeguarding non-combatants from the ravages of war. As the conflict continues, calls for accountability grow louder, with advocacy for investigations into potential war crimes committed by Russian forces through the use of drones (Hromov, 2023; Yuval, 2023).

The humanitarian impact of drone strikes on civilian infrastructure is stark. The resulting deprivation of essential services has led to widespread suffering among the Ukrainian population. The United Nations and various humanitarian organizations have raised alarms about the situation, noting that millions of civilians face acute shortages of heat, electricity, and clean water as winter sets in. This crisis has not only immediate health implications but also long-term effects on the country's recovery and rebuilding efforts post-conflict (WHO, 2023; Brann, 2023). This humanitarian dimension is crucial for understanding the full spectrum of consequences of drone usage in warfare.

Drones also facilitate the documentation of these attacks, with various non-governmental organizations (NGOs) and citizen journalism initiatives using drone technology to capture evidence of strikes on civilian infrastructure. This evidence is vital for international legal accountability and for raising awareness about the humanitarian consequences of the conflict (Nguyen, 2023; Cazalet, 2023). This demonstrates not only the technological role of drones but also their importance as advocacy tools for human rights.

The impact of drone warfare on civilian infrastructure in the Russia-Ukraine conflict is profound and multifaceted. The targeting of essential services undermines the resilience of the Ukrainian population, exacerbates humanitarian crises, and raises significant legal and ethical questions regarding the conduct of warfare. As the conflict evolves, it is crucial for the international community to address these issues, ensuring accountability for violations of IHL and prioritizing the protection of civilians in military operations. The lessons learned from this conflict will shape future discourse on the use of drones and the need for stringent regulations to govern their deployment in warfare (Sparrow, 2023; Turchinov, 2023).

5. Technological Advancements in Drone Warfare: Future Drones



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The ongoing conflict in Ukraine has significantly accelerated advancements in drone technologies, reshaping the landscape of modern warfare. Both Ukrainian and Russian forces are heavily investing in the development and deployment of advanced Unmanned Aerial Vehicles (UAVs), leading to rapid technological innovations that could redefine military engagements in the future (González, 2023; Krulak & Bowers, 2023).

In the Russia-Ukraine war, both sides have utilized drones for various roles, including reconnaissance, surveillance, targeting, and direct attacks. The Ukrainian military has notably leveraged drones supplied by Western allies, such as the Turkish Bayraktar TB2, which have proven effective in targeting Russian armor and artillery positions (Smith, 2023; Hromov, 2023). The integration of advanced sensors, cameras, and guided munitions in these drones has enabled precision strikes that were previously not possible with traditional aircraft (Pavlenko, 2023; Baker, 2023).

On the other hand, Russia has deployed its UAVs, such as the Orlan-10 and the Lancet. These drones are equipped with intelligence, surveillance, and reconnaissance (ISR) capabilities, providing real-time data that enhance situational awareness and targeting accuracy (Zhuravlev, 2023; O'Hara, 2023). Their use has demonstrated how UAV technology can shift the balance of power in asymmetric conflicts, allowing smaller nations to challenge larger military forces more effectively (Turchinov, 2023; Lytvynenko, 2023).



Orlan – 10 Russian Drone, source: mil.in.ua



Lancet - The Russian Kamikaze Drone

A significant trend in drone technology is the integration of artificial intelligence (AI), which is poised to revolutionize military operations. Both Russian and Ukrainian forces are exploring ways to incorporate AI into their UAV systems, enabling drones to process vast amounts of data and make autonomous decisions (Duncan, 2023; Yuval, 2023). This advancement has the potential to enhance the operational efficiency of drones, allowing for quicker and more informed decision-making on the battlefield.

The rapid evolution of drone technology in the Russia-Ukraine war suggests that UAVs will play an increasingly prominent role in future conflicts. This development has several implications for global security:

- **Increased Accessibility of Advanced Technologies:** As drone technology becomes more advanced and widespread, it is likely that non-state actors and smaller nations will gain access to sophisticated UAV systems. This democratization of military technology could lead to more conflicts involving drone warfare, as various actors attempt to leverage these tools for strategic advantage (Sparrow, 2023; Cazalet, 2023).



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- **Potential Proliferation:** The use of drones in Ukraine has drawn attention to the potential for the proliferation of drone technologies. Countries observing the conflict may seek to acquire or develop similar capabilities, leading to a new arms race in drone technology. The ease of producing drone systems may encourage more actors to engage in conflicts that leverage these tools, potentially destabilizing regions (Nguyen, 2023; Brann, 2023).
- **International Legal Challenges:** The deployment of autonomous drones raises significant legal and ethical concerns regarding accountability and compliance with International Humanitarian Law (IHL). As AI systems gain autonomy, determining responsibility for actions taken by these drones will become increasingly complex. The international community will need to establish robust legal frameworks to govern the use of UAVs, ensuring that their deployment adheres to humanitarian principles (Hromov, 2023; Lytvynenko, 2023).

The advances witnessed during the Russia-Ukraine conflict highlight the transformative potential of UAVs in modern warfare. The integration of AI into drone systems is poised to redefine military operations, posing both opportunities and challenges for global security. As nations continue to invest in these technologies, it is crucial to navigate the ethical and legal implications that accompany their deployment, ensuring that the evolution of drone warfare aligns with humanitarian norms (Turchinov, 2023; Yuval, 2023).

Future Drone – Prototype 2024, source: uvify.com



4. Conclusions

Technical evolution enables the building of command, control, communications, computer, cooperation, information, interoperability, surveillance and reconnaissance systems – C5I2SR, and even more.

The conflict between Russia and Ukraine has marked a significant turning point in modern warfare, with drones and intelligence gathering emerging as pivotal components of military strategy. The integration of these technologies has not only reshaped traditional military tactics but has also raised critical ethical, legal, and operational questions about the future of armed conflict. The extensive use of drones in the Ukraine war has illustrated their evolution from reconnaissance tools to vital assets capable of conducting precision strikes and intelligence operations. Drones such as the Turkish Bayraktar TB2 and Russian Orlan-10 have demonstrated the ability to gather real-time intelligence, enabling rapid decision-making and enhancing situational awareness on the battlefield. This shift signifies a departure from conventional warfare, where the tempo and efficiency of military operations can be significantly altered by the effective use of UAVs Artificial Intelligence.

The integration of artificial intelligence into drone systems represents a critical advancement in military technology. AI-powered drones can process vast amounts of data, analyze threats, and even make autonomous targeting decisions, thus enhancing operational capabilities. However, this



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autonomy introduces complex challenges regarding accountability and compliance with International Humanitarian Law (IHL), particularly in relation to civilian safety and the ethics of autonomous warfare. The strategic targeting of civilian infrastructure in the Russia-Ukraine conflict has raised significant humanitarian concerns. Drones have been employed not only for military objectives but also to disrupt essential services, causing widespread suffering among civilians. This dual-use of technology highlights the need for robust legal frameworks to govern the use of UAVs and to ensure compliance with IHL .

Implications for Global payments observed in the Russia-Ukraine war indicate a broader trend towards increased reliance on drone warfare in future conflicts. As the barriers to accessing drone technology lower, non-state actors and smaller nations may increasingly adopt these tactics, potentially leading to new conflicts and destabilization in various regions. This proliferation underscores the importance of establishing international norms and regulations surrounding the use of drones in warfare to prevent escalation and ensure accountability. Looking ahead, the Russia-Ukraine conflict will likely influence military strategies worldwide. The combination of drones and AI in warfare presents both opportunities for operational efficiency and challenges related to ethical considerations and accountability. As nations continue to invest in these technologies, the need for dialogue among international stakeholders becomes crucial to address the implications of autonomous weapons and to uphold humanitarian principles in armed conflict

In conclusion, the Russia-Ukraine conflict has clearly showcased the transformative impact of drones and intelligence on modern military tactics. As warfare continues to evolve, it becomes increasingly crucial for the international community to actively engage in shaping the ethical, legal, and operational frameworks that will regulate the use of these advanced technologies. Striking a balance between military innovation and the protection of humanitarian principles is essential to ensure that the future of warfare aligns with international standards and prioritizes the safety and dignity of civilian populations.

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**FROM MESSAGE CONTROL TO INTERACTIVE DIALOGUE:
THE EVOLUTION OF STRATEGIC COMMUNICATION**

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Abstract:

Strategic communication has undergone significant transformation in response to the rapidly changing media landscape and global environment. From its early roots in public relations and advertising to its current role encompassing corporate communication, political campaigns, and crisis management, the field has expanded to include a wide array of tools, techniques, and platforms.

The digital revolution, characterized by the rise of social media, big data, and real-time information sharing, has redefined how organizations, governments, and individuals communicate strategically. What was once a top-down process aimed at controlling a message has evolved into a dynamic, interactive dialogue with stakeholders across multiple channels. Additionally, the increasing importance of reputation management, corporate social responsibility, and ethical transparency has elevated strategic communication to a critical function in decision-making at the highest levels.

This article explores the historical development of strategic communication, analyzing key milestones that have shaped its current practices. It will also examine how emerging trends such as artificial intelligence, data-driven decision-making, and the shifting expectations of global audiences continue to drive its evolution, making it a vital part of organizational success in today's interconnected world.

Key words: strategic communication; change; trends; artificial intelligence;

1. Introduction

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2. The Evolution of Strategic Communication: From Public Relations to Digital Engagement

Strategic communication has experienced profound changes over the decades, adapting to technological advancements and the growing demands of a globally connected society. From its origins in public relations and advertising to its expanded role in areas like corporate communication, political strategy, and crisis management, it now encompasses a diverse range of tools, techniques, and platforms. This article explores the historical development of strategic communication, identifies key milestones that shaped its practices, and examines the emerging trends driving its evolution in today's digital age.

Historical Development of Strategic Communication

Early Roots in Public Relations and Advertising

The early 20th century saw the formalization of public relations (PR) as a professional field, with pioneers like Edward Bernays and Ivy Lee playing key roles in shaping how organizations presented themselves to the public. PR was primarily focused on managing public perception, influencing opinion, and maintaining a positive image for businesses, governments, and individuals [1].

At the same time, advertising became a central tool for brands seeking to promote their products and services. Companies used traditional mass media, such as newspapers, radio, and television, to broadcast controlled messages to large audiences. This top-down communication model aimed to shape consumer behavior and brand loyalty, relying on the assumption that audiences were passive receivers of information.

The Rise of Corporate Communication and Reputation Management

By the mid-20th century, the field of communication expanded beyond PR and advertising to include corporate communication, emphasizing the importance of an organization's overall messaging and reputation. Corporate communication encompassed not only external marketing efforts but also internal communications, investor relations, and employee engagement. This period saw the emergence of crisis communication, where companies had to manage reputational risks and protect their image in the face of scandals, product failures, or public backlash [2] .

The rise of 24/7 news cycles and the increasing power of media watchdogs made it essential for organizations to maintain strong relationships with the press and the public. Communicators had to be proactive in building trust, maintaining transparency, and responding quickly to crises. This marked a shift toward more sophisticated communication strategies that balanced control with adaptability.

Political Communication and the Power of Persuasion

Strategic communication also became a vital tool in politics, especially during the rise of mass media in the 1960s and 1970s. Political campaigns increasingly relied on televised debates, news coverage, and advertising to influence public opinion. The ability to craft persuasive messages and control narratives became central to electoral success. The use of polling and data-driven analysis helped political strategists fine-tune their messages to resonate with different demographic groups [3] .

The political realm demonstrated how strategic communication could mobilize support, influence public policy, and manage crises. As media platforms proliferated, so did the complexity



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of reaching voters. Communicators had to master new mediums, from radio to television, and later, the internet and social media.

3. The Impact of the Digital Revolution

Social Media and the Democratization of Communication

The advent of the internet, and more specifically social media, transformed strategic communication by shifting the dynamics of how information is shared and consumed. Platforms like Facebook, Twitter, and Instagram allowed individuals, organizations, and governments to communicate directly with audiences, bypassing traditional media gatekeepers.

This shift democratized communication, giving a voice to users while simultaneously posing challenges for communicators. The top-down, controlled messaging model was no longer feasible in an environment where audiences could instantly react, comment, and share content. Organizations were forced to engage in real-time, interactive dialogues, where transparency and responsiveness became crucial for maintaining credibility and trust [4] .

Additionally, the speed of information dissemination on social media introduced new risks. Rumors, misinformation, and crises could spread rapidly, requiring organizations to develop crisis communication strategies that could react within minutes, not hours. Communicators also had to be adept at managing reputational damage across multiple platforms simultaneously.

Big Data and Targeted Communication

The rise of big data significantly altered how organizations approach strategic communication. With vast amounts of data now available from digital interactions, organizations could analyze audience behavior, preferences, and demographics with unprecedented precision. This shift enabled communicators to craft highly personalized messages, targeting specific groups with tailored content that resonated with their interests and concerns.

Big data also allowed for the measurement of communication effectiveness in real-time. Campaigns could be monitored, adjusted, and optimized based on how audiences responded. This data-driven approach made strategic communication more efficient and impactful, allowing organizations to allocate resources where they would achieve the greatest return on investment.

Artificial Intelligence and Automation

Emerging technologies like artificial intelligence (AI) and automation are further transforming the field of strategic communication. AI-powered tools enable organizations to analyze vast datasets, identify trends, and predict outcomes with greater accuracy. Chatbots and virtual assistants can handle routine customer interactions, freeing communicators to focus on more complex or high-stakes conversations.

AI is also being used to create and distribute content. Algorithms can analyze audience preferences and generate personalized messages, further enhancing the precision of communication efforts. As AI continues to advance, it will likely play an even more significant role in decision-making processes, helping communicators anticipate challenges and opportunities more effectively.

4. Evolving Expectations of Global Audiences

Reputation Management and Corporate Social Responsibility (CSR)



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In the digital age, reputation management has become more complex, as audiences increasingly expect organizations to be socially responsible and ethical. Consumers, employees, and investors now demand transparency in everything from environmental practices to labor conditions and corporate governance. Strategic communication must address these expectations, ensuring that organizations are not only perceived as successful but also as ethical and accountable.

Corporate social responsibility (CSR) initiatives have become central to how companies communicate their values and build relationships with stakeholders. By aligning their communication strategies with CSR efforts, organizations can enhance their reputations and foster long-term loyalty among consumers and partners.

Ethical Transparency and Authenticity

The rise of social media and real-time information sharing has heightened the demand for authenticity. Audiences can quickly detect and react to inconsistencies, forcing organizations to adopt communication strategies that are transparent and honest. In an age where any individual can amplify their voice and potentially reach millions, organizations must ensure that their messages are consistent with their actions.

Strategic communicators today must prioritize ethical transparency, understanding that failure to do so can lead to public backlash, loss of trust, and long-term reputational damage. Authenticity has become a key asset in building strong relationships with stakeholders, requiring communicators to carefully balance messaging with genuine corporate behavior.

The Future of Strategic Communication

As strategic communication continues to evolve, several trends will shape its future:

Artificial Intelligence: AI will further enhance data analysis, enabling more precise audience targeting and predictive analytics.

Real-time Crisis Management: The increasing speed of information dissemination will necessitate even faster response times in crisis communication.

Integration Across Platforms: Strategic communication will continue to require seamless integration across digital and traditional platforms, ensuring consistent messaging.

Audience Empowerment: Audiences will continue to shape communication strategies, forcing organizations to maintain open, two-way dialogue.

Strategic communication will remain a critical function for organizations navigating the complexities of the modern media landscape. Success will depend on a communicator's ability to adapt to technological advancements, engage with empowered audiences, and maintain ethical transparency in an interconnected world.

5. Conclusion

Strategic communication has evolved from its roots in public relations and advertising to become a multifaceted discipline that plays a central role in today's organizations. The digital revolution, the rise of social media, and the emergence of new technologies like AI have reshaped how organizations interact with their audiences, shifting from controlled messaging to interactive dialogues. As global expectations continue to change, the importance of ethical transparency, reputation management, and data-driven decision-making will drive the next phase of strategic communication's evolution. The ability to navigate these changes effectively will be critical to organizational success in the future.



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**MISSION COMMAND DURING LOW INTENSITY BATTLES AND
STABILIZING OPERATIONS. ARE WE PREPARED?**

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Abstract:

Concept of Mission Command is not new, however, dynamics of present and requirements of future battle fields have further enhanced the relevance and importance of its right adaptation and execution. With mixed results of low intensity battles and stabilizing operations as a result of Armed conflicts during last two decades or so, this paper explores aspects in addition to the debate of mere centralized and decentralized control normally linked with Mission Command concept. Previous researches have correctly identified training aspects required in a Military set up during peace time to bleed less during operations under Mission Command environment. This paper inquires whether we are ready to accept our vulnerabilities and preparing towards a directional training while keeping in view various myths as a case in point. Through results of recent conflicts and experience of officers involved in such operations, this paper identifies a gap in previous researches pertaining to importance of International Relations knowledge and aspects of Psychological domain for officers, especially during low intensity battles and stabilizing operations in the twenty first century Battlefield environment. This paper concludes by identifying that transformation of Commanders at Strategic, Operational and Tactical level coupled with threat spectrum at Strategic/ Operational level if identified correctly will have a trickle down effect for Tactical level commanders being good students of International Relations. This will increase the Morale and Motivation level of subordinates enabling them to assess Political sensitivities, understand and address the complexities involved in low intensity battles and stabilizing operations and value the conflict in today's environment of continuous chaos.

Key words: Mission Command; Directional Training; Myths, Centralized; De-centralized; Low Intensity Battles; Stabilizing Operations; International Relations; Morale and Motivation.

1. Introduction

As Helmut Moltke said, plan of a battle becomes the first attrition as a result of enemy contact. Ever since the term Mission Command was coined in United States guide book in 1821[1], gradually it has been a part of thought process of operational policies of contemporary militaries [2]. Manuals are saturated with Mission Command concept which is decentralized implementation of centralized plans [3] varying from kinetic, non-kinetic, low intensity battles and stabilizing operations [4]. However, diverse opinions about the efficacy of Mission command during Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) in Afghanistan are a case in point. The sensitivities attached with operations in such an environment at the Government and Military level have made Mission Command at times too high a risk to be implemented [5]. Some comment that technological advancements in current operational atmosphere especially communications have raised a question about the relevancy of this concept and made adoption of this strategy less effective [6]. Moreover, turbulence of post war scenarios make the setting of objectives ambiguous which are against the true essence of Mission Command. Ironically, attributes of flexibility, freedom of action and swift manoeuvres at subordinate level are required while operating under the concept of Mission Command [7].

Performances as a result of Mission Command concept during operations OIF/ OEF are attributable not only to the underlying weaknesses in Mission Command as a theoretical idea, or to



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its lack of suitability to low intensity battles and stabilizing operations, but also to a failure to meet fully the training prerequisites so critical to the concept. The enduring nature of low intensity battles and stabilizing operations as an inevitable consequence of armed conflict, and the prevalence of such operations in the post–Cold War environment, are impossible to ignore.

Simultaneously, with progress in Communication on one hand, modern disruption technologies like electronic warfare systems, underscores the vulnerability of Command structures that rely on constant access to Communications and on-ground intelligence. All of these factors speak to the importance of developing units that can fight independently in a complex, dynamic environment, with limited direction from higher levels of command when required; possible through the competent utilization of Mission Command. In turn, this requires decentralized leadership based on mission-type orders rather than a strict centralized control, which defines the mission; the commander’s desire and what is to be achieved, but leaving decisions on how to execute the mission to subordinate commanders [8].

Low intensity battles and stabilizing operations as a consequence of armed conflict put an even greater emphasis on the importance of the Militaries proficiency in Mission Command and manoeuvre warfare, through the competence and training of its officers. Drawing on existing scholarly literature, this paper identifies a set of central preconditions, or enablers, that need to be present in a military organization keeping in view various Myths in order to counter our vulnerabilities and practice Mission Command efficiently. These include shared understanding and trust; initiative; a tolerant approach to failure, learning; and the acceptance of Mission Command as an all-encompassing practice.

This paper through recent conflicts and the experience of officers involved in such operations, identifies a Gap in previous researches pertaining transformation of senior Commanders, knowledge of International Relations especially for subordinates as well as Psychological Domain to include Morale and Motivation to achieve desired results in a twenty first century Battle field environment. This paper assesses current preconditions for a successful practice of Mission Command. Knowledge of International Relations and Psychological domain have been a prominent feature during Mission Command operations in recent conflicts especially low intensity battles and stabilizing operations. If the officers with low Morale and Motivation also lack understanding of International affairs, the complexities of low intensity battles and stabilizing operations will be difficult to handle. The article concludes that the increasing complexity of the tasks performed by officers during low intensity and stabilizing operations demands correct threat spectrum at the higher level and its alignment with understanding of junior level officers skilled in the knowledge of International Relations will have an effect on Morale and Motivation. This will enable them to understand Political sensitivities, value the conflict to achieve better results in a persistently troublesome environment.

2. Literature Review

2.1 Historical Perspective

The experiences gained from losses of Napoleonic battles forced the Prussian Army to evaluate concept of Mission Command for the first time only to be incorporated later in the doctrine of German Army in 1917 and Blitzkrieg operation during World War II [9]. Field Marshal Helmuth Von Moltke was instrumental in introducing the concept in German Army during his tenure from 1857 to 1888 as a result of experiences gained through defeats at Jena and Auerstädt in 1806 [10]. Initially termed ‘Auftragstaktik’, the concept provided freedom of action to junior leaders under the overall intent of senior leaders [11]. Post World War II, strategy of Germans based on the concept of



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Mission Command formed the basis of Military planners especially in the West. Such was the impact of Mission Command that it became an essential element of combat manoeuvres in times to come [12].

With the advent of Cold War threat, United States gave a serious thought towards Mission Command concept for the first time. Before that, despite theoretical acceptance of the concept as a result of Germans creativity during World War II [13] and an understandable focus towards a Centralized Command and Control operation in Vietnam [14], United States serious efforts came only after being challenged by a serious Soviet hazard [15]. Mission Command allows a decentralized implementation of a mission by junior leaders based on mission oriented instructions under the overall ambit of Commanders resolve on what is to be accomplished but not the way to achieve it (how), which is left for junior leaders to decide [16].

2.2 Recent Conflicts

United States has conducted Stabilizing operations as a result of Armed conflicts every eighteen to twenty four months since the culmination of the Soviet threat, with the duration of each operation from five to eight years [17]. During last two decades or so, Low Intensity Battles and Stabilizing Operations mainly Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) have been in the lime light and most talked about. However, previous stabilizing Operations in the Horn of Africa and Philippines as well as actions undertaken in areas of Georgia and Yemen are a strong proof of the importance of Low Intensity Battles and Stabilizing Operations in twenty first century Military tasks. Stabilizing operations have followed almost every Armed conflict by United States Military in the recent past. However, two operations having similarity to OEF and OIF stabilizing operations are those conducted during the Philippine-American in 1902 [18] and Vietnam wars in 1975 [19].

Outcome of OEF and OIF has been varied and gradual application of Mission Command during operations in Afghanistan and Iraq has raised concerns about its effectiveness especially in Low Intensity Battles and Stabilizing Operations. It has been argued that increasing number of stake holders to include different countries and organizations with different strategic and political sensitivities has made the application of Mission Command concept in such an environment a risky affair of high magnitude [20].

United States less success during OEF and OIF are attributable not to the limitations of Mission Command as a concept during Low Intensity Battles and Stabilizing Operations but to more evident aspects of failing to adopt enablers of Mission Command concept in their organization. During OEF and OIF, Commander's Emergency Response Program (CERP) [21], which provided discretionary funds at lower levels for construction work and Provincial Reconstruction Teams (PRT) [22] which functioned to create a link at the provincial level, both met with partial success due to wide scope of work, multiple asks and long duration of operations which led to uncertainty. On the other hand, Village Stability Operations (VSO) met with more success due to limited scope, few tasks and less duration of operations [23].

2.3 Directional Training

With the importance of Low Intensity Battles and Stabilizing Operations during twenty first century, Mission command as an improved version of Military operations other than war gets more pronounced [24]. Earlier studies have termed Mission Command as a prerequisite of manoeuver warfare [25]. However, effectiveness cannot be achieved unless Mission Command concept is accepted by a complete Military organization to include the actions linked with it must



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saturate the entire set up, its educational priorities and grooming personality of all ranks serving in it [26].

As part of routine training, Armies should focus on junior ranks officers to create a culture of interaction necessary to adopt Mission Command concept. During initial part of twentieth century, Germans focused on socializing of Officers during training in order to create a specific leadership relationship in their Army [27]. The fundamental aspect of Mission Command concept is developing human affairs – pyramid of ranks within the organization, relationship between superiors and subordinates, providing independent thought process and space to other ranks [28].

During Military training, acceptance of errors by subordinates and risks linked with it should be accepted since same officers or troops will be involved in majority of actions involved in Low Intensity Battles and Stabilizing Operations of future. As it is said, acceptable Military risk depends on specific culture of a country, Military training during peacetime and type of operation participating in [29].

Too much interference in the work of subordinates is to be avoided during peacetime training. Although, advancement in technology has enabled Senior ranks to closely supervise situation in the Battle field. However, it can be counterproductive if used to interfere subordinates actions rather than to help spread intent of Senior Commander in order to assure correct understanding of a particular situation [30].

For any Military to perform well in the Battle field scenario, there should be no dearth of acceptance and confidence among seniors and junior level ranks during training [31]. Basis of this relationship should be built on professionalism rather than nepotism or friendship [32].

During training, initiative and independence of action should be practised. From a strategic to tactical level, this attribute is to be practised as an important catalyst of Mission Command concept [33].

In the twenty first century period, clear objectives with limited scope enhances the chances of operational success. Due to difficult and uncertain situations, decision making becomes difficult for Commanders making possibility of issuing clear orders a distinct possibility unless relying on de-centralized Command and Control concept. According to Storr, contemporary Armies despite accepting importance of Mission Command are not prepared to execute this concept fully [34].

Mission Command has to be part and parcel of daily routine from garrisons to combat [35]. Low Intensity Battles and Stabilizing Operations seldom give reaction time to shift between phases of operation, demanding quick transition from one mission to another and more often than not different phases at one time [36]. Contingencies must be practised by Militaries to take actions in coordination with any community or lower levels to be effective [37].

Mission command requires training comprising actions of small teams and all-inclusive solutions to problems. The presence of multiple stake holders with different culture, training and personalities warrants application of de-centralized Mission Command concept in operations of twenty first century [38].

Notwithstanding advancement in Technology which has made access to information more easy, still during Low Intensity Battles and Stabilizing Operations, Tactical commander on ground is the best judge. Moreover, information overload can make situation for higher Commanders uncertain. Therefore, Mission command is to be included in Doctrines of contemporary militaries as a fundamental Command and Control concept [39].

It has to be realized that conducting Low Intensity Battles and Stabilizing Operations as a result of armed conflicts requires more resources in terms of manpower, equipment, education as well as time. This aspects merits attention during planning and training phases of Militaries [40].



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Considering localized nature of present and future war scenarios, Mission Command can be the right strategy with necessary pre-conditions.

Mission Command is not fire and forget. It is not only a debate between centralized and decentralized execution either. It is a mindset which has to be inculcated in your Military culture so as to further translate into right leadership qualities. Uncertain requirements of future battle field merits preparing for evolving war scenarios [41].

2.4 Myths about Mission Command

Wehrmacht are credited with the introducing the concept of Mission Command and always employed it during World War II. It has to be seen that they employed it while remaining within the confines of tactical limitations as per Fuehrer's directives during particular battles only. However, not every commander had the leverage to go as per his own desire without clear instructions from higher authorities. Wehrmacht were a politically enthusiastic force relying at times on penalties to ensure discipline in the Army.

During World War II Allies focused towards Centralized control of the battle and never on Mission Command. It has been seen that Allies did understand the importance of Mission Command, assigned their subordinates narrow zones which were carefully monitored but were less flexible since they kept resources at Army level unlike Wehrmacht who were more flexible by employing the resources at Combined Arms Teams level. Allies were more effective in battles requiring heavy build-up of forces than employing Mission Command.

Mission Command concept is anti-centralized Command. It has to be understood that Mission Command does not create hurdles for Centralized Command system. It is a blend of right combination of any Military with regards to their peacetime training, structure, particular situation of the battle and then leadership quality to assess the point at which authority has to be passed on to a junior level and to what extent [42].

Employing the concept of Mission Command is a single decision of Commander. It was more applicable in the past, however, still detailed planning and execution brought better results at that time. Particular decision of a Commander certainly impacts the very concept of Mission Command. It makes future assessment even more uncertain as to whether peace time training aspects will be directed towards initiative of junior leaders or a Centralized control. Unless Commanders decision is institutionalized based on collective preparation and based on joint experience, it will be detrimental to Mission Command concept. Creativity is the hall mark of Military profession but practically, focus on superfluous arrangements and fear of unknown has brought creative ability towards a deadlock. Some comment that recent advancement in technology has made the practicality of employing Mission Command needless. However, on the contrary, despite robust military communication network, Battlefield environment is still turbulent. It creates difficulty for Commanders to identify clear objectives with limited scope and ensuring mutual understanding of multiple forces involved in the field [43].

Preconditions for employing Mission Command concept in the past and today are same. It has to be realized that scope of Military battles in past was restricted and decisions at subordinate level were not affecting multinational forces or organizations. Moreover, communication system was not robust at that time forcing Commanders to rely mostly on junior leaders. Today as Eitan Shamir mentioned, initiative in present environment requires coordination with different Armies and their structures. A case in point is Mission Command concept in the US, UK, and Israeli armies with different methods due to dissimilar cultures. Mission Command today is based more on collective professionalism, practice and training [44].



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2.5 Psychological Domain

Previous studies have identified the myths related to Mission Command concept and training aspects required to prepare for the future. Twenty first century has added few dimensions to this old concept which are Informational, Civilian and Psychological. While Informational and Civilian aspects during Low Intensity Battles and Stabilizing Operations have been well discussed in the past, it is the aspect of Psychological domain which needs more deliberation in today's Battle field environment.

Morale and Motivation affect a soldier and those soldiers combined together affect Military Operations. Weapons, equipment and material resources are nothing without Soldiers. On the other hand, senior officers are responsible for setting the right priorities. Clausewitz mentioned that factors of Morale and Motivation combine the spirit that saturates complete war scenario. He described the major factors contributing towards Morale and Motivation are the professionalism of the commanders, the knowledge and bravery of soldiers, and their nationalistic approach [45].

Trauma and anxiety are permanent features of any Military action. Anthony Kellett includes exhaustion, long duration tenure, different cultures and areas, availability of food, refreshment opportunities, strategies used by different Armies, feeling of achievement under uncertain conditions, identifying friend or foe, political sensitivities attached with results (win or lose), are the attributes of war for any Military soldier [46].

Low-Intensity battles and stabilizing operations can be for prolonged durations with no clear end in sight. Compared to the conventional conflicts, soldiers are faced with a borderless, directionless and faceless enemy to cope with. Armies employed in such environment have to exercise constraint, remain neutral and still counter life threats. More often than not, such scenarios do not give reaction time to shift from defensive to aggressive posture or vice versa. Implications of Political decisions at times do not coincide with clear decision making required at the tactical level. Ironically, material and resources required for such operations are more as compared to conventional wars. Troops operating under such situations have to adopt the variations in tactics and cope with the concepts of other Command teams which has its own demerits and difficulties.

To operate successfully in today's environment, Armies have to identify the right threat spectrum through training of officers in International Affairs to maintain the required Morale and Motivation level of soldiers. Since a soldier of today is well aware and well informed, he needs to value the conflict he is participating in and should be able to link nationalistic or a patriotic approach with his or her military duty.

3. Research Findings and Opinions

Human Mission Command does not exonerate senior Military Commanders from accepting responsibilities. Rather it brings an added task for any Army to train and develop Commanders with revolutionary and creative mindset who can understand political sensitivities, link it with Military requirements and achieve targets identified at the National level. Once existing orders for subordinates do not fit into overall situation, Commanders should allow juniors to exercise Mission Command concept.

Mission Command gives onus of responsibility to junior Commanders by providing them freedom of manoeuvre while remaining within confines. However, it has to be observed that a junior officer of today is suffering from Information Overload or is really well informed. In such a scenario, being a good student of International Relations becomes imperative to acquaint oneself with history, current crisis and way forward.



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Military training needs to inculcate Critical thinking ability among senior and junior leaders alike. Commanders having Critical thinking ability will have necessary negotiation and consensus building skills to agree or disagree which can serve as a right combination in a cross cultural diverse situation. United States Army depends on exhaustive orders and British Army give orders in general terms.

Mission Command of twenty first century environment is different from the past. Due to Globalization, interdependency and fight for natural resources will be more evident. Effects of your right or wrong decision are not restricted to your own country. Future Battlefield environment warrants leaders with combined war fighting capabilities so as to understand dynamics of internationally integrated Battlefield scenarios. Training needs to develop those attributes useful to align National priorities with Military partners in order to tackle the complexities involved in dealing with dissimilar organizations. For Militaries around the world, twenty first century is likely to be a period of continuous conflict. With sophisticated weapons and dispersed Battle formations, importance of Mission Command increases. Need of the hour is the understanding that at times it is more easy to spend on production and acquisition but it will be a race against time.

The advancement in Technology is advantageous both for own and enemy forces. While own Commanders have the advantage of robust communication network, a well-planned Cyber-attack by the enemy can also disrupt key areas of any country. Moreover, wide spread dispersion of forces brings more uncertainty for Commanders despite technology highlighting the importance of Mission Command.

Myth of Civil Military conflict needs to be tackled with appropriate understanding of using force, its limitations and inherent risks involved in it. Senior Military Commanders need to have requisite Communication skills to proffer advice at the political level as well as pass the right perspective at the subordinate level. Strategic, Operational and Tactical level commanders must understand the authority of Government decisions over Military requirements.

Armies should be prepared to accept risk and errors made by subordinate Commanders. Although acceptability level of risk depends on type of operation and decisions made at the strategic level while maintaining equilibrium of Military requirements.

Identify strong areas of juniors to raise their Morale and Motivation level. Career of officers should not replace the Mission Command concept where juniors are likely commit blunders at times. During recent examples, Islamic State in Iraq, Syria and Taliban in Afghanistan operate on instructions.

There is no doubt that present era is different from the past. Now a wrong decision at lower level can affect not only your own forces but various Command teams operating side by side. Range and scope of operations have expanded making it difficult for Commanders to set clear objectives and accept risks attached with Mission Command operations all the time. However, considering the advancement in technology and accessibility, junior leaders must be good students of Geo Politics to understand not only the current scenario but also the back ground of issue at hand to identify the correct threat spectrum and sensitivities at the national and political level.

4. Conclusion

Mission Command is still a relevant concept of twenty first century and has to be seen holistically. Mission Command is not a tussle between De-centralized and Centralized control but a combination of way of Military life and mind set adopted during peace time to bear the fruits during Battle field scenarios. One shoe fits all is not likely to provide results over night but rather through standardization, mutual trust, risk acceptance and freedom of action in the Army. Question of why



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and what should be the hall mark of senior level but how should be delegated to lower level Commanders only after detailed analysis, deliberation, assessment, understanding of context and situation on ground by Commanders. Even if decentralized execution has to be adopted, it should be within tactical limitations provided by a Senior Commander.

Mission Command can be a right tool to link strategic planning rationalism with Military conservatism among own, international forces and various other Organization. In today's Battlefield environment, humans will decide battles and outcome. Victory may have to be re-defined in today's war as compared to the past experiences.

Combining hard and soft power is the need of the hour. Its understanding is possible with right understanding of Geo Politics not only by senior ranks but also by the junior level. We should make an endeavour to learn lessons from Afghanistan and Iraq since no stability is possible under fire. To overcome hostile and rogue elements, need is to inculcate interpersonal communications and negotiation skills in Commanders to understand environment of interagency and multinational forces where there will be no clear lines of Authority in order to reach to a logical conclusions under the ambit of Mission Command concept.

Future Battle field will certainly be intense, fluid and stressful. Despite advancement in technology, commanders will still remain uncertain about next course of action and right decision. This paper endeavours to contribute to the existing literature by highlighting the importance of Geo Politics for all Commanders and role of psychological factors like Morale and Motivation for subordinates to achieve desired results. The paper is likely to create an impact that no Military solution is likely to provide long term answers to conflicts unless it is integrated with National decision making. Creating value of conflict and addressing psychological domain for all ranks operating under Mission Command is need of the hour.

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**STRATEGIES FOR ENHANCING MILITARY LEADERSHIP: A
CASE STUDY OF VUCA PRIME IN THE COLOMBIAN
AEROSPACE FORCE**

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Abstract:

Contemporary wars illustrate the profound challenges faced by military leaders. The dynamics of warfare have transcended traditional notions of control as the battlefield has become increasingly volatile, uncertain, complex, and ambiguous (VUCA), as noted by the military strategist Carl von Clausewitz, who proclaimed, "war is the realm of uncertainty." Faced with this reality, military organizations are compelled to adapt rapidly to the changing environment. This essay explores the applicability and potential benefits of the VUCA PRIME behavioral leadership model within the Colombian Aerospace Force, with the aim to provide this organization with a tool based on four core elements: "Vision," "Understanding," "Clarity," and "Agility," enabling it to effectively address the challenges faced by her military leaders when they dealing with volatile, uncertain, complex, and ambiguous situations. By examining how these model components can guide decision-making and leadership qualities, this essay aims to underscore the imperative role of the VUCA PRIME model in transforming the approach of the Colombian Aerospace Force towards the complexities of the VUCA environment.

Key words: VUCA phenomenon; VUCA PRIME model; military organizations; leadership, agile organizations; complex systems.

1. Introduction

The acronym VUCA was originally introduced by the United States Army War College between 1986 and 1991 to describe the increasingly volatile, uncertain, complex, and ambiguous global landscape that emerged after the end of the Cold War [1]. Since then, this acronym has evolved into a valuable term for characterizing the daily scenarios in which individuals and institutions operate, highlighting the challenges they face. In 2007, Robert Johansen introduced the 'VUCA Prime' model in his book *'Get There Early: Sensing the Future to Compete in the Present.'* This model presents four key elements that offer guidance to leaders who grapple with the perpetual dilemma of making decisions too hastily or too belatedly when dealing with volatile, uncertain, complex, or ambiguous situations. These four elements are: 'volatility' – which corresponds to 'vision,' 'uncertainty' – entailing 'understanding,' 'complexity' – involving 'clarity,' and 'ambiguity' – emphasizing 'agility.' This article seeks to delve into the applicability of the concepts of vision, understanding, clarity, and agility within the Colombian Aerospace Force as it confronts the prevailing VUCA environment.

2. VUCA phenomena and Model VUCA PRIME

In light of the evolving battlefield dynamics where terrorism and guerrilla warfare blurred traditional distinctions, military organizations faced a pressing challenge. They had to adapt swiftly to the new reality of Volatility, Uncertainty, Complexity, and Ambiguity (VUCA). This chapter explores the origins of VUCA and introduces the VUCA PRIME model as a valuable tool to address these challenges.

Long before the term VUCA became widespread in business environments, terrorism and guerrilla warfare were already reshaping the battlefield by acting swiftly and blurring the lines



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between enemy combatants and uninvolved civilians. This created an urgent need for military organizations to adapt to a new and complex environment characterized by VUCA, in order to effectively respond and survive in these challenging conditions.

To describe environments with these characteristics, the United States Army War College coined the term VUCA for first time between 1986 and 1991, primarily to help its students, often high-ranking military officers, understand and navigate the turbulence they would encounter as they assumed increasingly strategic leadership positions. But what exactly do the four components of VUCA mean?

Volatility refers to the nature, speed and magnitude of change and consequently to the lack of stability and sudden change of events, Uncertainty, for its part, refers to the low understanding of problems and events, due to insufficient information; which results in a lack of predictability and the prospect of surprise, Complexity refers to chaos, understood as the multiple interconnections of events or the overwhelming amount of information that needs to be processed, and, finally, ambiguity, refers to the lack of understanding, cause and effect are not understood and there are no antecedents to help with decision making [2].

In practice, the four terms—Volatility, Uncertainty, Complexity, and Ambiguity—are intricately intertwined, with the complexity and volatility of an environment directly impacting the predictability of future events and, consequently, heightening the level of uncertainty. Despite their interconnectedness, these four concepts collectively create a challenging environment that is difficult to understand and control.

To equip leaders with the tools to enface this type of environments, in 2007, Robert Johansen introduced 'VUCA Prime' in his book *'Get There Early: Sensing the Future to Compete in the Present'*. This model, based on in the human experience, reframes the VUCA acronym to emphasize 'Vision,' 'Understanding,' 'Clarity,' and 'Agility' as the antidotes to effectively confront Volatility, Uncertainty, Complexity, and Ambiguity—VUCA environments [3]. By focusing on these key attributes, leaders can better prepare themselves and their organizations to thrive in an ever-changing and unpredictable world.

The VUCA PRIME model is designed to forge a profound connection between leaders and their teams, underpinned by purpose-driven communication. This deep connection fosters a culture in which information flows more freely, enabling decisions and actions to align seamlessly with the overarching objectives of the organization. The synergy between VUCA and VUCA Prime gives rise to a state of productive energy, capable of propelling organizations towards adaptation, change, and evolution in response to the demands of their organizational environment. By adopting a multi-model approach to transformational change, organizations can better position themselves to thrive in complex and dynamic environments.

3. Applying VUCA PRIME model in Colombian Aerospace Force

As we have examined the fundamental concepts of the VUCA PRIME model, it is now essential to shift our focus towards its practical application within the Colombian Aerospace Force. This exploration aims to underline the critical role the VUCA PRIME model can play in addressing the multifaceted and challenging security landscape that Colombia faces today.

The Colombian Aerospace Force serves as the aerial defense branch of the Republic of Colombia, established in 1919 with a fundamental mission outlined in the National Constitution of 1991. Its core responsibilities encompass the exercise and maintenance of control over Colombia's airspace, along with the defense of national sovereignty, territorial integrity, and the Constitutional order.



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Today, Colombia faces formidable security challenges on both domestic and international fronts. These challenges stem from factors of instability, including rising rates of massacres and kidnappings, the alarming expansion of illicit crop cultivation, reaching approximately 230,000 hectares according to a UN report [5], and the influx of Venezuelan migrants due to the neighboring country's complex economic situation and human rights issues. Additionally, a bilateral ceasefire agreement with guerrilla groups, promoted by the Colombian government, further complicates the landscape for the Colombian Military Forces.

Given this complex and multifaceted environment, it is imperative to explore the applicability of the VUCA PRIME model within the Colombian Aerospace Force to effectively address these challenges.

3.1. Vision

In the VUCA PRIME model, Johansen's first proposal involves addressing volatility with 'Vision.' This concept encompasses the notion of creating the future through purposeful action, wherein the words that constitute the vision are translated into actionable routines. Whether at the individual, group, or organizational level, this translation process serves to generate a transformative shock wave of change. In rapidly changing environments, it becomes imperative for individuals and organizations to have a clear sense of direction, even if the outlined path may need to adapt or undergo alterations during the process. Having a vision is as, if not more, crucial than the ability to make predictions, as it revolves around the act of building the future rather than merely studying it. A well-defined vision enables individuals and organizations to concentrate on what truly matters, allowing them to distinguish priorities amidst the multitude of activities, requests, or opportunities that may arise. A long-term strategic vision not only provides a clear sense of direction but also serves as a guiding force for actions, fostering a heightened sense of engagement and ownership by clarifying the pursued goal and one's contribution to it.

In essence, a bold vision transcends volatility, offering a confident and composed perspective untethered by the constraints of the present. It acts as a beacon guiding decision-makers toward the horizon they seek to shape, rather than being shaped by the assumptions of the current moment.

In the military context, the concept of 'Vision' has a counterpart that can be likened to the 'Desired End State.' Here, military leaders articulate what the future should look like and specify the actions required both now and in the future to attain the desired outcomes [4]. The Colombian Aerospace Force, for instance, unveiled its vision for the year 2042, which states:

“To exercise dominance in air, space, and cyberspace, the Colombian Aerospace Force will be innovative, multipurpose, interoperable, regional leader and preferential, with global reach and real, permanent, and sustainable deterrent capabilities” [6].

This vision sets a clear benchmark for what the institution aspires to achieve by 2042 (the Desired Final State) and outlines the necessary steps to reach it. What makes this vision particularly powerful is its ability to inspire individuals to work collectively toward a common goal for the greater good. It represents a shared vision that is understood and embraced by all members of the organization, offering a clear roadmap for achieving the desired goals.

3.2. Understanding

In the VUCA PRIME model, 'Understanding' takes center stage as a means to grapple with uncertainty. Listening and comprehension become paramount when dealing with rapidly changing situations, where the consequences of such changes are often unknown. Effective communication ensures that all parties involved share a common understanding of the situation. Moreover, it plays a



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pivotal role in fostering trust-based relationships within the organization. In times of crisis, it is this trust, shared interests, and the decision-making competence of the organization's leaders that mobilize people to act cohesively.

Furthermore, 'Understanding' encapsulates the essential qualities leaders must possess, including openness, responsibility, the establishment of clear expectations and objectives, the ability to address challenging topics, strong listening and interpersonal skills, modeling desired behavior, and having trust in others [3].

Johansen raises it to deal with uncertainty. Listening and understanding are key to discovering new ways of thinking and acting since when a situation changes quickly and the effects that said change can generate are unknown, communication is key to being certain that the interested parties have the same level understanding of the situation. Additionally, it is key to building relationships of trust between people in the organization, so that when a crisis situation occurs, people mobilize based on trust, interests and the decision-making capacity of the organization's leaders. Similarly, 'Understanding' encompasses the essential attributes that leaders must possess, including openness, responsibility, the establishment of clear expectations and objectives, the ability to address difficult topics, strong listening and interpersonal skills, modeling the desired behavior, and trust in others [3].

Now, let's delve into how 'Understanding' in the context of military leadership is essential, drawing from various authors' perspectives. As we explore the military viewpoint on 'Understanding,' it becomes evident that it plays a vital role in guiding the decision-making and leadership qualities expected of military commanders.

In the military context, numerous authors have studied the requirements that military leaders must meet. Clausewitz [7], in his work 'On War,' in Book I - Chapter 3 and in Book II - Chapter 2, emphasized that Commanders must possess innate gifts of intellect and temperament, and these elements must be harmoniously combined. Additionally, they must exhibit enthusiasm and courage in the face of danger to inspire their subordinates. This perspective suggests that qualities required for leadership may not be acquired but rather are innate 'gifts,' as etymologically 'enthusiasm' denotes 'divine inspiration' or 'God within oneself.

This insight prompts questions about the essence of a Commander and whether the qualities of a leader can be acquired or are innate gifts.

Concerning the first aspect, the United States Air Force defines a leader as 'One who assumes responsibility and is capable of motivating others to accomplish a mission or objective' [8]. In a similar vein, the Colombian Aerospace Force describes a leader as one who inspires and motivates others to fulfill a common mission [9]. These definitions share common elements, notably motivation and the achievement of objectives. Therefore, for the purposes of this essay, a military leader will be understood as an individual responsible for influencing their subordinates, motivating them to accomplish the mission and achieve the vision.

Regarding the age-old debate of whether leaders are born or made, the literature offers various perspectives. Some, like Ausburn, Lynna & Ausburn, Floyd [10], or Peter Drucker, argue that while there may be a few born leaders, they are too few in number to rely on [11]. Others, such as Browne [12], contend that leaders must be nurtured and developed to acquire the competencies necessary to lead an organization. From these differing viewpoints, it can be deduced that leadership, existing at the intersection of art and science [13], is not an absolute concept. Instead, it allows for nuances and a wide array of attributes, including knowledge, skills, abilities, and other characteristics (KSAOs) that contribute to effective leadership.

Following an extensive literature review on the essential KSAOs that leaders must possess, it has been established that, within the scope of this essay's focus on the military field, the



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requirements for leaders in the Colombian Aerospace Force are comprehensively detailed in the model presented by the United States Army, as outlined in the Army Doctrine Reference Publication (ADRP) 6-22, titled 'Army Leadership.' This model sets forth the specific attributes that leaders should embody and the core competencies they must exhibit to effectively meet the challenges inherent to their roles [14]

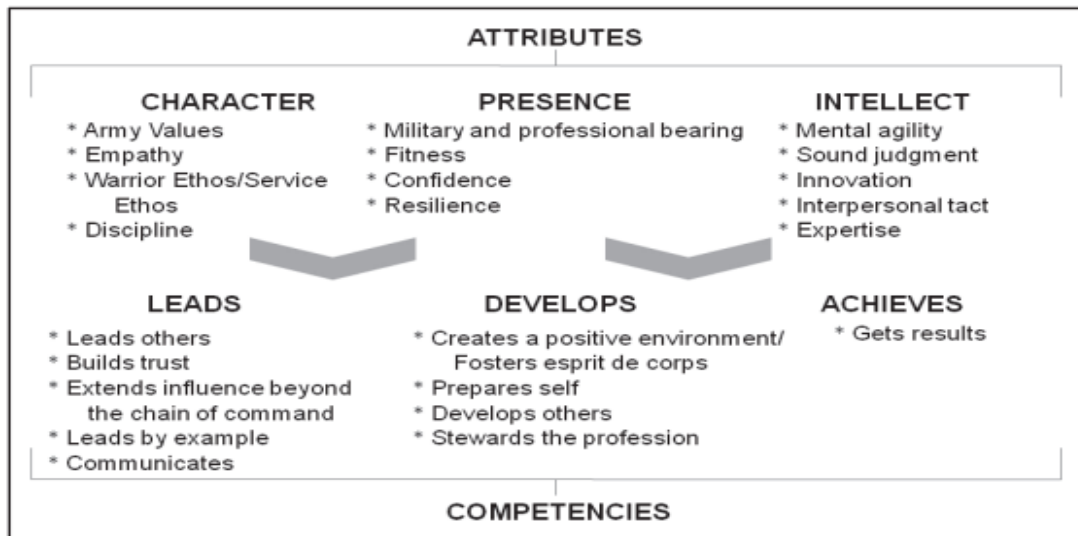


Fig. 1. Army Leader Requirements Model (ALRM) [14]

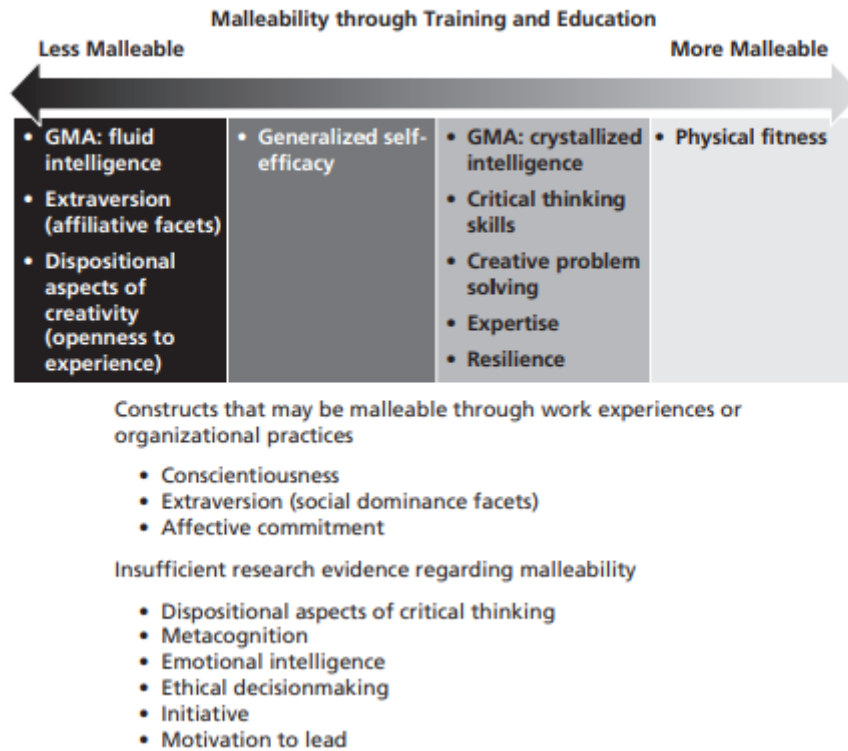
In 2018, the U.S. Army Training and Doctrine Command, Combined Arms Center, commissioned a study from the RAND Corporation. (RAND, a research organization established immediately after World War II, specializes in bridging military planning with research and development decisions). The primary objective of this study was to determine the extent to which leader characteristics, particularly those associated with attributes outlined in the Army Leader Requirements Model, can be developed through training and education. Additionally, the study aimed to identify effective approaches for measuring these characteristics. The findings from this



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study are presented in Figure



2

Fig. 2. Degree of Malleability of ALRM Constructs [15]

As a result of our analysis, it becomes evident that not all of the essential leadership attributes required by the Colombian Aerospace Force can be cultivated solely through education and training. Therefore, it is imperative to introduce tools and methods in the recruitment process that aid in identifying applicants who already possess these desired leadership characteristics, especially those that are less amenable to change through training and education. This proactive approach in the recruitment phase can help ensure that the organization selects individuals who inherently exhibit the qualities crucial for effective leadership within the Colombian Aerospace Force.

3.3. Clarity

Johansen's approach to managing complexity, 'Clarity,' revolves around creating a competitive advantage by harnessing complexity without introducing unnecessary complications. To tackle this complexity, Codreanu [3] suggests employing the six rules outlined by Morieux and Tollman in their book *Six Simple Rules: How to Manage Complexity without Getting Complicated*. These rules are founded on the premise that effective complexity management hinges on a harmonious blend of autonomy and cooperation.

Individual autonomy leverages the flexibility and agility of people, while cooperation fosters synergy, ensuring that collective efforts are harnessed most efficiently. This dynamic sets in motion a virtuous cycle wherein enhanced performance creates more opportunities for individuals. This, in turn, leads to greater commitment, higher aspirations, and ultimately, improved performance.

It is pertinent to explore whether military organizations function as complex systems. Complex systems are characterized as systems composed of numerous agents, each of which must



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act individually according to its unique circumstances and requirements. Yet, these individual actions have global effects, which simultaneously alter the circumstances and requirements affecting all other agents. Within military organizations, multiple hierarchies of complex systems coexist, consisting of agents that adapt to their environments, including adversary agents, and thereby induce changes in the environments of all other agents. Given the high level of complexity in the challenges faced by military leaders, it is essential to have tools at their disposal to navigate this complexity effectively, without succumbing to the bureaucratic tendencies often associated with hierarchical organizations.

In the specific case of the Colombian Aerospace Force, it places paramount importance on its human talent, recognizing their invaluable contributions through dedication and effort in achieving institutional objectives. Human resources stand as the primary success factor in fulfilling the organization's mission. With this perspective, the Colombian Aerospace Force has placed a strong focus on comprehending the actual tasks performed by individuals and the reasons behind their actions.

The organization actively promotes cooperation through incentive mechanisms and fosters a culture of continuous learning, leveraging the implementation of lessons learned. This approach enables the entire organization to adapt swiftly to the ever-evolving environment, ensuring its agility and responsiveness in the face of change.

3.4. Agility

To conclude the analysis of the VUCA PRIME model, Johansen advocates addressing ambiguity through 'Agility.' This concept pertains to an organization's ability to respond swiftly and effectively to unforeseen opportunities and threats. It involves the capacity to promptly reconfigure strategies, structures, processes, people, and technologies to harness these opportunities and create and sustain value. An agile organization imbues speed and adaptability into stability, thereby becoming a crucial source of competitive advantage within VUCA (volatile, uncertain, complex, and ambiguous) conditions [3].

While military organizations often operate as traditional, hierarchical entities with static structures and linear planning and control mechanisms, this does not preclude them from evolving into highly dynamic yet inherently stable organizations, akin to agile organizations. Achieving this transformation necessitates a focus on three critical aspects: the organizational structure, which dictates resource distribution; the processes that define how tasks are accomplished; and the individuals who carry out the mission [16].

The Colombian Aerospace Force has implemented mission teams as a foundational structure, providing stability to the organization by enabling rapid learning and decision cycles. These teams, which include squads in the operational sphere and technical teams in maintenance, are empowered by advanced technological tools that facilitate real-time information exchange (such as SIO, Hermes, Teams, Office 365, etc.).

These mission teams adhere to a common and shared doctrine encompassing mission, vision, principles, and values. This shared foundation enables the creation of value for all stakeholders. Furthermore, these teams serve as the Minor Planning Units within the Planning, Programming, and Budgeting (PPBS) framework, ensuring the allocation of necessary resources for their operations.

It's essential to note that PPBS cycles often prove too extensive to allow the required agility in uncertain operational environments. Consequently, Colombian legislation has introduced the concept of contracting under manifest urgency. This approach, while emphasizing adherence to



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fundamental principles of state contracting such as transparency, economy, and responsibility, facilitates a more agile response to operational needs.

The Colombian Aerospace Force has organized its processes into four distinct classes within its process map:

1. **Managerial or Strategic Processes:** These processes provide overall direction to the entire institution, enabling control of both missionary and support processes. They are guided by the institutional mission and vision, which serve as guiding principles for the organization's actions.
2. **Missionary Processes:** This class comprises activities directly related to the organization's core purpose, including non-delegable tasks necessary for fulfilling the FAC Mission.
3. **Support Processes:** These processes are geared toward generating solutions and resources essential for supporting both the Management and Mission Processes. Their primary objective is to facilitate the effective, efficient, and successful operation of the institution. This class includes two subcategories: the Support Management Process and the Human Management Process.
4. **Evaluation and Improvement Process:** This process class holds a transversal role across all other processes. Its responsibility is to evaluate and enhance the institution's overall performance and effectiveness.

In Figure 4, the FAC's process map is depicted. This map takes into account the inputs from various interested parties, including society, other armed forces, and state entities. These inputs collectively contribute to the outcomes of enhancing security, defense, and fostering development within Colombia.





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The Colombian Aerospace Force (FAC) regards its human talent as its most valuable asset, considering it a pivotal factor for the successful management and achievement of its objectives and outcomes. In 2022, FAC introduced the Strategic Talent Plan Human, which outlines strategies for the comprehensive management of human talent across the public servant's entire career lifecycle, encompassing entry, development, and retirement phases. This strategic plan is closely aligned with the Colombian Air Force's overarching priorities.

The plan serves as a guiding framework for both military and civilian personnel, ensuring the adherence to principles of merit in job assignments, skill development, service provision, incentive programs, and individual performance evaluations [19]. It underscores the FAC's commitment to nurturing and optimizing the potential of its human resources to meet its strategic objectives. This model, characterized by its streamlined structure, simplified processes, and a focus on human talent as the Force's most valuable asset, empowers the Colombian Aerospace Force (FAC) to swiftly and efficiently reconfigure its strategy, structure, processes, people, and technology in response to emerging opportunities and the need to protect value.

In doing so, an agile organization injects speed and adaptability into its operational stability, forging a pivotal source of competitive advantage, particularly in the face of VUCA (volatile, uncertain, complex, and ambiguous) conditions.

4. A Practical Case

The Colombian Aerospace Force (FAC) effectively applied the principles of VUCA PRIME to combat illicit drug trafficking by air. Let's examine how they did this:

Vision: The FAC's vision of achieving air and space dominance was aligned with the goal of stopping illicit drug trafficking by air from Colombian territory. Their long-term strategic vision for 2042 served as a guiding benchmark, ensuring that all actions taken were in line with this desired objective.

Understanding: The FAC's success in combating drug trafficking by air was underpinned by a profound understanding of the illicit drug trade. They extensively studied the routes used by traffickers and their evolving tactics. This understanding was achieved through a combination of intelligence gathering and international cooperation. By continuously adapting to the rapidly changing environment, the FAC was better equipped to respond effectively to emerging threats.

Clarity: The FAC prioritized operational clarity by avoiding unnecessary complications. They defined clear roles and responsibilities for all involved parties, both domestically and internationally. This streamlined mission execution and cooperation, leading to the efficient utilization of resources. Key agreements, such as the ABD (Air Bridge Denial) Convention, provided a legal framework for swift actions against suspicious aircraft in Colombian airspace, ensuring a clear and decisive response.

Agility: The fight against drug trafficking represented a quintessential VUCA environment. The FAC showcased agility by rapidly adjusting their strategies and tactics in response to the evolving methods of traffickers. The signing of the ABD Agreement exemplified their agile approach to dealing with suspicious aircraft. Moreover, their commitment to international cooperation and the adoption of advanced technology demonstrated further agility. The adoption of state-of-the-art radar and communication systems allowed real-time tracking and effective communication, enhancing their capability to detect and interdict illicit flights promptly.

This real-world example highlights how the Colombian Aerospace Force effectively applied the principles of VUCA PRIME to combat the complex and ever-changing challenges of drug



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trafficking by air. Their success underscores the importance of having a clear vision, in-depth understanding, operational clarity, and agility when operating in a VUCA environment. It serves as a compelling case study of how these principles can be employed to address real-world challenges and achieve strategic objectives.

5. Conclusions

In an environment like the one we live in, characterized by volatility, uncertainty, complexity, and ambiguity, military organizations like the Colombian Aerospace Force must embrace innovative leadership models such as the VUCA PRIME model to address the challenges posed by these types of environments. By incorporating the principles of vision, understanding, clarity, and agility, they can better prepare their organizations to adapt to ever-changing environments.

The success of any organization, including the military, depends on its ability to adapt quickly and effectively to changing environments, and this adaptation is carried out by its human talent. The Colombian Aerospace Force, aware of this reality, has emphasized that its human talent is its most valuable asset, ensuring an effective response to VUCA conditions.

Leadership in military organizations is a topic in constant evolution. The dichotomy of whether leaders are born or made is secondary to the fact that leadership is a blend of art and science. The attributes and competencies included in the ALRM model allow military leaders to effectively address the challenges associated with VUCA environments.

The VUCA PRIME model is a practical guide that military leaders can employ to confront the complexities of today's battlefield and achieve mission success by integrating vision, understanding, clarity, and agility.

To succeed in a VUCA world, military organizations must strive for continuous learning and adaptation. The Colombian Aerospace Force exemplifies the adoption of agile principles without losing focus on mission fulfillment and the achievement of its vision by 2042.

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**NEW TECHNOLOGIES IN THE CONTEXT OF NATIONAL
SECURITY AND INTERNATIONAL RELATIONS: NATO
BUILDING INTEGRITY (BI) AWARENESS COURSE AS THE
CASE STUDY**

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Abstract:

The purpose of the study is to familiarise the readers with the utility of the new technologies and solutions related to the security ecosystem. During the research conducted it was possible to collect important data on the anti-corruption matters, seen from the Ukrainian perspective and to formulate recommendations on the utility of the e-learning tools for sharing building integrity awareness. Need for the study is based on building integrity realm within Ukrainian security and defence environment and relates with the opportunities offered by the e-learning tools to reach the large number of persons on-line to take the e-learning courses. As the background of the research activities, it is needed to mention about the Decree of the President of Ukraine of June 20, 2023, No. 344/2023. Deputy Head of the National Agency for the Prevention of Corruption was appointed National Coordinator for Ukraine's Cooperation with NATO in the Field of Integrity Building. To ensure the implementation of its powers in shaping anti-corruption policy regarding integrity in the security and defence sector, the National Agency runs the Directorate for Shaping Integrity Policy in the Security and Defence Sector. Considering the fact that joining the North Atlantic Alliance is a priority task for Ukraine, and reforms aimed at building integrity include introducing modern management standards, ensuring independence from political interference, increasing employee professionalism, investing in education and training of personnel, the National Coordinator for Ukraine's Cooperation with NATO in the Field of Integrity Building informed the entities about the possibility of completing/passing an online course developed by experts of the NATO and translated into Ukrainian. He stated that this course was mandatory for NATO military and civilian personnel, as it provides general knowledge about integrity and good governance education in NATO member states. During the course, participants can familiarize themselves with basic knowledge about integrity and good governance education. After successfully completing the course, each participant can receive a personalized certificate at the end. This course has been accessible, from the beginning of June 2024, on the NATO DEEP ADL Portal, while the solution/approach which is the result of the collaborative efforts involving two institutions of the Defence and Security Cooperation Directorate of Operations Division: (1) Governance and Institutions, (2) Defence Education Enhancement Programme and the NATO Representation in Ukraine (NRU). Introduced methodology is mainly based on collecting data while using functionalities offered by the NATO DEEP ADL Portal - satisfaction survey consisted of eight questions. To date (01 September), more than 113,000 participants have completed this format, including members of the Armed Forces of Ukraine, the Ministry of Defence of Ukraine, the Ministry of Internal Affairs of Ukraine, the National Guard of Ukraine, the State Border Guard Service of Ukraine, the National Police of Ukraine, the State Emergency Service, the Security Service of Ukraine, and many other institutions. The National Agency of Corruption Prevention and the national coordinator for NATO BI policy implementation have significantly promoted the course among relevant institutions. Since participants completed the course, data had been collected within satisfactory survey and processed, accordingly. The practical implications are of utmost importance, allowing for introducing this approach in case of other elearnig courses.

Key words: NATO, Building Integrity, Ukraine, security environment, e-learning, DEEP



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7. Introduction

To ensure an effective educational process in Ukraine and the South Caucasus, it is crucial to implement and develop robust management mechanisms, allocate resources wisely, continuously enhance intellectual resources, refine military educational programs, improve educational assets, and adopt modern learning and evaluation methods. Prioritizing the ongoing integration of scientific approaches in military educational program development is essential. This involves comprehensive processes such as analysis, planning, development, performance, and evaluation [Iskandarov, Gawliczek, pp. 35-44].

Achieving these objectives presents significant challenges for any single nation and requires practical support. NATO's Defence Education Enhancement Programme (DEEP) plays a pivotal role in this context. The NATO DEEP utilizes the Advanced Distributed Learning (ADL) Portal to facilitate the modernization of professional military education by offering a centralized platform for sharing and developing online courses. This portal acts as both a repository for existing courses and a collaborative space for course designers to share expertise [Iskandarov, Gawliczek, pp. 35-44]. By addressing the specific needs of partner nations through customized faculty and curriculum development, DEEP promotes standardized, technology-driven approaches to military education that enhance interoperability and institutional self-sufficiency. This strategy aligns with NATO's commitment to integrating innovative technologies to strengthen defence education and governance [Gawliczek, pp. 111-119].

DEEP has become an essential partner in supporting institutional reform and enhancing professional military education (PME) in the Ukraine and South Caucasus. Its approach combines curriculum development, faculty training, and e-learning tools to modernize military education according to international standards. Education serves as a transformative agent, with NATO leveraging it to support institutional reform in partner countries. The integration of modern e-learning tools through NATO DEEP's ADL Portal has significantly expanded outreach and facilitated the sharing of critical expertise. These tools foster innovative learning experiences for both students and instructors, promoting interoperability and professionalization within armed forces [Iskandarov, Simons, Gawliczek, pp. 7-34].

NATO's education and training programs have evolved from a narrow focus on interoperability to comprehensive frameworks that support the modernization and reform of defence education institutions. By collaborating with NATO, South Caucasus countries gain access to specialized courses, seminars, and expertise that strengthen their ability to align with NATO standards and contribute to joint operations. The South Caucasus nations continue to play a vital role in NATO operations and missions. By utilizing NATO DEEP and related initiatives, they can enhance their defence institutions, adopt best practices in education and governance, and make meaningful contributions to regional and global security efforts.

The NATO DEEP Programme is a cornerstone of Ukraine-NATO collaboration. For over 12 years, it has supported nearly all educational institutions within Ukraine's security and defence sectors [Birchenko, pp. 11-15]. DEEP's mission is to drive institutional reform by modernizing military education through a three-pronged approach:

1. **Curriculum Development:** This includes revising existing curricula and designing new courses on logistics and defence planning, facilitated by NATO instructors.
2. **Faculty Development:** DEEP exposes Ukrainian instructors to modern teaching techniques, from lesson planning to student assessment, ensuring the highest standards.
3. **Institutional Reforms:** Advising military academies on structural and financial management aligns their practices with NATO standards and the Bologna Process.



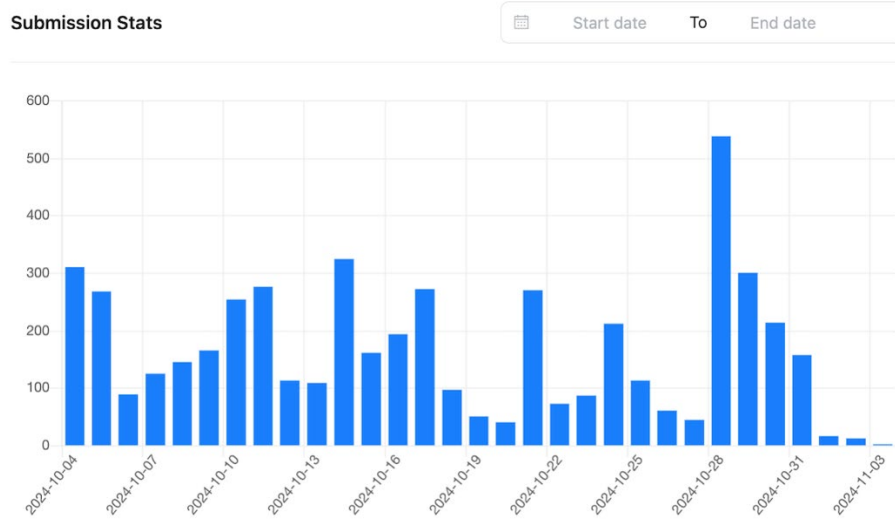
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8. NATO Building Integrity (BI) Awareness Course

Since its inception, DEEP has trained over 15,000 Ukrainian instructors and students in NATO methodologies [Birchenko, pp. 11-15]. Online learning initiatives have further expanded the program's reach, particularly during the COVID-19 pandemic and ongoing conflicts. A significant milestone was achieved in June 2023 with the Decree of the President of Ukraine (No. 344/2023), appointing a Deputy Head of the National Agency for the Prevention of Corruption as the National Coordinator for Ukraine's cooperation with NATO on integrity building. The course, which is part of the NATO BI Awareness curriculum, was made mandatory for NATO personnel and accessible to Ukrainian participants, thereby enhancing the institutional capacity in areas such as independence from political influence, professionalism, and anti-corruption. The NATO's Building Integrity (BI) program provides a suite of educational tools, including the NATO Building Integrity Awareness Course. The course, jointly developed within DEEP, was introduced on the NATO DEEP ADL portal, an essential platform for distance learning and knowledge exchange. The translation of the course into Ukrainian allowed for broad participation across various defence and security institutions, with approximately 125 519 Ukrainian participants completing the course by 2nd November 2024. The National Agency of Corruption Prevention, Ukraine's national coordinator for NATO BI policy, has actively promoted the course, contributing significantly to its success and widespread adoption.

9. The Course Submission Statistics¹



The data for this study were collected through satisfaction surveys administered via the NATO DEEP ADL portal. The survey, comprising eight questions, gathered insights on the effectiveness of the course and participant satisfaction. The participant base spans numerous Ukrainian defense and security entities, including the Armed Forces of Ukraine, Ministry of

¹ All statistical data referenced in this document originate from the Building Integrity e-learning course, accessible via the NATO DEEP ADL Portal (deeportal).



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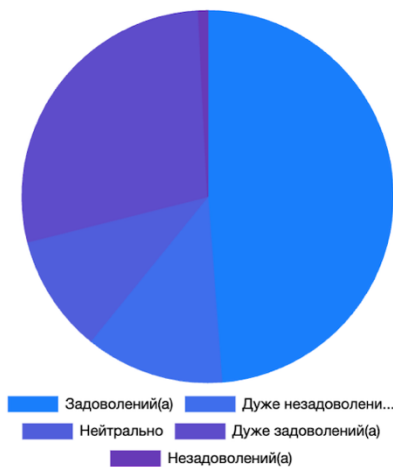


Defence, Ministry of Internal Affairs, National Guard, State Border Guard Service, National Police, State Emergency Service, Security Service of Ukraine, and other institutions.

10. Satisfaction Survey – dedicated questions and answers

Question. 1 - How satisfied are you with the information you received during this course?
The answers ranged from ‘very satisfied’ to ‘dissatisfied’

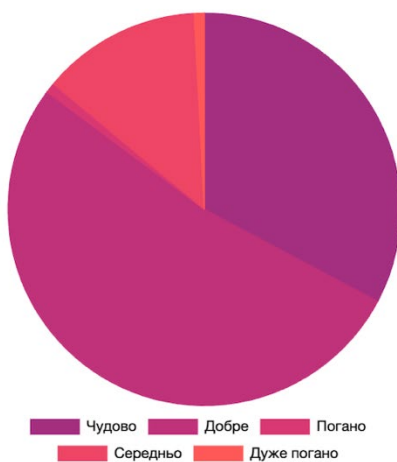
Питання 1 – Наскільки ви задоволені тією інформацією, яку отримала завдяки даному курсу?



Label	Total	%
Задоволений(а)	26900	48
Дуже задоволений(а)	15502	28
Дуже незадоволений(а)	6645	12
Нейтрально	5641	10
Незадоволений(а)	441	0

Question 2 - How would you rate the clarity and structure of the course content?
The answers ranged from ‘Good’ to ‘very bad’

Питання 2 – Як би ви оцінили чіткість та структуру змісту курсу?



Label	Total	%
Добре	28909	52
Чудово	18065	32
Середньо	7241	13
Погано	461	0
Дуже погано	453	0

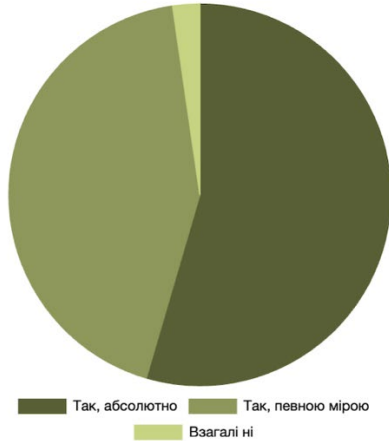
Question 3 - Did the course meet your expectations?
The answers ranged from 'Yes, absolutely' to 'Not at all'



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Питання 3 – Чи даний курс зміг задовільнити ваші очікування щодо нього?

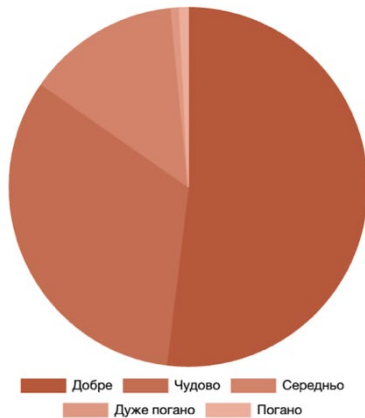


Label	Total	%
Так, абсолютно	30058	54
Так, певною мірою	23811	43
Взагалі ні	1260	2

■ Так, абсолютно ■ Так, певною мірою
■ Взагалі ні

Question 4 - How would you rate the accessibility and usability of the NATO DEEP ADL Portal?
The answers ranged from 'Good' to 'Not good at all'

Питання 4 – Як би ви оцінили доступність та зручність використання освітнього порталу NATO DEEP ADL Portal?



Label	Total	%
Добре	28632	51
Чудово	18054	32
Середньо	7588	13
Погано	439	0
Дуже погано	416	0

■ Добре ■ Чудово ■ Середньо
■ Дуже погано ■ Погано

Question 7 - Would you recommend this online course and the NATO DEEP ADL Portal to others?

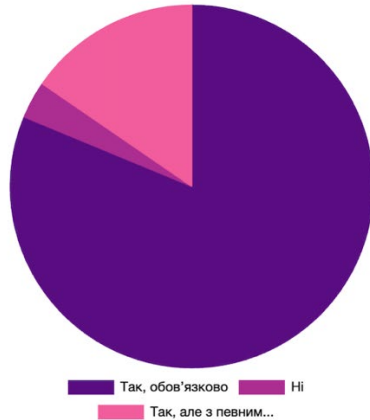
The answers ranged from 'Yes, of course' to 'Not at all'



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Питання 7 – Чи порекомендували б цей онлайн курс та освітній портал NATO DEEP ADL Portal іншим?



Label	Total	%
Так, обов'язково	44795	81
Так, але з певними застереженнями	8501	15
Ні	1833	3

The survey data indicate that the course was well-received among participants, providing essential knowledge on integrity and governance in line with NATO standards. The satisfaction survey reveals strong engagement from defense institutions, underscoring the demand for scalable e-learning solutions to enhance integrity across sectors. Additionally, the success of this model highlights the potential for replicating similar initiatives within other educational programs facilitated by NATO DEEP.

The NATO Building Integrity Awareness Course is designed to be easily accessible to participants, ensuring that personnel from various institutions can join without difficulty. Upon successful completion, participants receive a personalized certificate. This structured approach ensures that each step of the process is straightforward, making the course accessible even for those with limited experience in online learning platforms.

11. Step by step view of course participant

1. Survey regarding the organisation/unit and status.



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NATO BI Awareness Course in Ukrainian

What is your Ukrainian Organisation/Unit? – Який орган ви представляєте? *

- ☐ Ministry of Defence – Міністерство оборони України
- ☐ Building Integrity Training and Education Center – Науковий центр проблем виховання доброчесності та запобігання корупції
- ☐ Ministry of Internal Affairs – Міністерство внутрішніх справ України
- ☐ National Police – Національна поліція
- ☐ National Guard of Ukraine – Національна гвардія України
- ☐ State Border Guard Service – Державна прикордонна служба
- ☐ State Emergency Service – Державна служба з надзвичайних ситуацій
- ☐ National Agency of Corruption Prevention – Національне агентство з питань запобігання корупції
- ☐ Ukrainian Defence Industry (UKROBORONROM) – Акціонерне товариство «Українська оборонна промисловість»
- ☐ Security Service of Ukraine – Служба безпеки України
- ☐ National Academy of Security Service – Національна академія служби безпеки України
- ☐ Educational establishments under MOI – Навчальні заклади системи МВС
- ☐ Other (please specify) – Інше (прошу вказати)

Other (please specify) – Інше (прошу вказати)

What is your status? – Який ваш статус? *

- ☐ Military – Військовий
- ☐ Civilian staff – Цивільний
- ☐ Temporary Staff – Тимчасовий персонал
- ☐ Intern – Інтерн
- ☐ Contractor – Контракт

SUBMIT – ВІДПРАВИТИ

2. Link to the ILIAS Page to access the course

NATO BI Awareness Course in Ukrainian

Курс з ознайомлення з ВІ НАТО українською мовою

Thank you for participating in the survey!

Here is a link to the NATO BI Awareness Course in Ukrainian. Please note that the training does not save participant progress and is expected to take approximately **60 minutes** to complete. Please allocate the appropriate amount of time for this course.

https://deepportal.hq.nato.int/iliass/goto.php?target=sahs_28531&client_id=DEEP

Дякуємо за участь в опитуванні!

Ось посилання на ознайомчий курс НАТО з розвідки українською мовою. Будь ласка, зверніть увагу, що тренінг не зберігає прогрес учасника і, як очікується, займе приблизно **60 хвилин**. Будь ласка, виділіть відповідну кількість часу для цього курсу.

https://deepportal.hq.nato.int/iliass/goto.php?target=sahs_28531&client_id=DEEP

3. Course access through ILIAS

ADL 336 - UKR - Курс НАТО з основ з виховання доброчесності	
Info	Learning Progress
View	
General	
Language	Ukrainian

4. Course main page.



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Курс НАТО з основ з виховання доброчесності
НАСТУПНИЙ КУРС

МЕТА:
Проінформувати цільову аудиторію щодо корупційних ризиків та їхніх наслідків на успішність проведення місії і надати вичерпну інформацію стосовно корупції і концепцій та інструментів з виховання доброчесності для зміцнення професіоналізму та ефективності діяльності Структур НАТО та відповідних національних інституцій.

ЦІЛЬОВА АУДИТОРІЯ:
Військовий та цивільний персонал на стратегічному та операційному рівнях Структур командування НАТО та Силівих структур НАТО, у тому числі тактичний рівень штаб-квартири. Штаб-квартира НАТО, Агенції, цивільний та військовий персонал, члени Альянсу та країни-партнери.

Після завершення курсу ви будете проінформовані про:

- Наслідки корупції на сферу безпеки
- Необхідність порушувати цю тему під час усіх планувань та операцій НАТО
- Важливість озвучення елементів з виховання доброчесності на усіх етапах планування та реалізації

5. After successful completion the certificate of completion is being generated.



DEEP Programme DEEP eAcademy DEEP Portals Newsletter

Generate the Certificate of Completion – Згенеруйте сертифікат про завершення

You successfully completed the NATO BI Awareness Course in Ukrainian! Below, you can find the form to create your certificate. – Ви успішно завершили курс НАТО з розвідувальної діяльності українською мовою! Нижче ви можете знайти форму для створення вашого сертифікату.

Name on the certificate – Ім'я в сертифікаті **(Required)**

Please enter the name that will be displayed on the certificate – Будь ласка, введіть ім'я, яке буде відображено на сертифікаті

0 of 35 max characters

Submit



DEEP Programme DEEP eAcademy DEEP Portals Newsletter

You can find your certificate below!

Ви можете знайти свій сертифікат нижче!

[Download certificate here](#) – Завантажити сертифікат тут

© 2024 DEEP Portal [Log in to ILIAS](#) [Log in to BBB](#)

6. Exemplary Certificate of completion



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NATO DEEP eAcademy

CERTIFICATE OF COMPLETION

This is to certify, that

John Doe

has successfully completed the

NATO BI Awareness Course in Ukrainian

NATO DEEP eAcademy Director

NATO DEEP Coordinator

Piotr GAWLICZEK

Mariusz SOLIS

12. Conclusions

The collaborative efforts between NATO DEEP, the NATO BI program, and Ukrainian institutions mark a significant stride toward enhancing integrity and transparency in Ukraine's defence sector. Through e-learning, the program has achieved substantial outreach and engagement, paving the way for further educational reforms aligned with NATO's standards. NATO's ongoing commitment to supporting Ukraine's institutional modernization through DEEP and other projects ensures a resilient and adaptable military education system that meets contemporary challenges. This model demonstrates the impact of coordinated efforts in achieving educational and governance reform and may serve as a framework for future integrity-building initiatives across partner nations. As part of its commitment to fostering international cooperation, NATO is translating this course into Arabic for deployment within Iraq's e-learning portal under the DEEP program. This extension signifies another step forward in promoting governance reforms aligned with international standards. In conclusion, the integration of NATO BI course within DEEP program has proven to be a functional and impactful solution. By combining innovative educational methods, institutional collaboration, and localized content, NATO has established a robust framework for enhancing governance and integrity. This model offers a replicable blueprint for other nations seeking to strengthen their defence and security sectors, contributing to global stability and cooperation.

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WHAT IS THE ROLE OF STRATEGIC FORESIGHT ANALYSIS IN ANTICIPATING FUTURE THREATS AND OPPORTUNITIES?

SANDU Nichita

Ministry of National Defence, Romania

Abstract:

This paper intends to be a synthetic description of Strategic Foresight Analysis as a concept and why it became more and more important for companies, organizations, nations and alliances like NATO to use this tool for shaping their strategy on medium and long term. Finally, this paper brings to reader's attention the main drivers of change, potential strategic shocks and the key challenges to the effective use of Military Instrument of Power as they were identified in the Strategic Foresight Analysis 2023 published by the Allied Command Transformation. Author's creativity was limited by the objective approach to data presented.

Key words: strategic foresight; challenges; instruments of power; military;

1. Introduction

Defense planning has been a long-standing practice throughout human history and it has played a crucial role in ensuring the survival and security of groups, communities, nations, and states.

Within the contemporary modern nation state, this practice has taken on great complexity through a variety of formal national and international processes [1], which challenge and renegotiate the civil-military relationship as well as the bureaucratic organization of the state as security threats evolve and proliferate. Davis' evolution of defense planning indicates, governments have had a hard time incorporating change into their defense planning systems, and to accommodate the condition of deep uncertainty. His analysis indicates how organizational inertia of the planning system calls for civilian and military strategic leadership and the necessity of reaching outside of established planning processes to access non-standardized analyses. [2]

To address the deep uncertainty when planning for mid and long term, organizations, nations and alliances as NATO started to proactively scan the horizon for emerging trends, potential disruptions, and untapped opportunities through strategic foresight analysis, to embrace a mindset of adaptability and agility.

2. Strategic foresight

2.1 What is strategic foresight?

Starting In 1990s from the US Army War College introduced the term VUCA, which stands for Volatile, Uncertain, Complex, and Ambiguous. It was initially used to describe the state of global affairs after the dissolution of the Soviet Union. Over time, VUCA has become a widely used framework in strategic planning within governments and organizations. Here's a brief overview of each component:

Volatile: Refers to the rapid and unpredictable nature of change.

Uncertain: Highlights the lack of predictability and the difficulty in forecasting future events.



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Complex: Indicates the multiplicity of forces, the confounding of issues, and the chaos that surrounds an organization.

Ambiguous: Suggests the lack of clarity about the meaning of an event and the potential for misreads.

Richard, Slaughter in his *Futures for the third millennium: enabling the forward view*, (1999), defined strategic foresight as the ability to create and maintain a high-quality, coherent and functional forward view, and to use the insights arising in useful organizational ways. For example, to detect adverse conditions, guide policy, shape strategy, and to explore new markets, products and services. It represents a fusion of futures methods with those of strategic management.^[3]

Currently, in a VUCA world, strategic foresight is seen as a proactive and methodical approach for organizations to prepare for the future. To better understand the concept, here are the key points:

- it is a Systematic Process: It involves collecting information relevant to the future through environmental scanning;
- involves Scenario Planning: Organizations extrapolate various plausible scenarios to anticipate and prepare for potential opportunities and challenges;
- involves Strategic Development: This process aids in aligning innovation planning and goals with the anticipated future scenarios;
- involves Preparation for Future: Strategic foresight enables organizations to be proactive rather than reactive to future developments.

This approach helps organizations to navigate uncertainty and make informed strategic decisions.

Strategic foresight and forecasting should not be confused. Strategic foresight and forecasting have similarities in that they both involve anticipating and preparing for future events, but there are significant differences. Quantitative data and trend extrapolation is the primary focus of forecasting, with the aim of predicting the most probable outcome based on past patterns. Strategic foresight is a more comprehensive approach that takes into account a wider range of factors, including qualitative data, expert insights, and multiple scenarios. Rather than focusing on a single future outcome, strategic foresight aims to develop a deeper understanding of the drivers of change and the various possible futures that could emerge. Organizations can improve their agility and adaptability in uncertain situations by developing strategies that can be adjusted and refined as new information emerges.

2.2 Why is strategic foresight important?

An organization may have a good understanding of the short-term trends in their industry, or even general long-term trends in society without strategic foresight. In a world that is interconnected, where change is happening at a faster pace and the boundaries between industries are blurring, there is a call for more understanding of the future.

Events on one side of the world have a ripple effect on the other side of the world. Today's small startup could cause disruption to the largest company in the world tomorrow. Political instability in a tiny area of the globe can change the balance of power and have widespread consequences across the globe. Not to mention no one knows where AI, automation, and other rapidly developing areas will take us.

The dominance of these topics in conference agendas and coffee table discussions has resulted in the development of systematic foresight activity, which is a good thing. An increasing



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number of organizations are interested in gaining a deeper understanding of how the world is changing and how to capitalize on these changes. Strategic foresight serves as a tool to assist them with that challenging task and, naturally, to ensure that organizations make well-informed decisions based on carefully evaluated perspectives of alternative future scenarios. Identifying emerging forces of change that can confer a competitive advantage and enhancing resilience through contingency planning, and facilitating the management of changes are some of the benefits of subjecting strategies to the scrutiny of various potential futures.

The use of this strategic foresight tool is not limited to public administration and business, as it also has relevance in personal development and diverse organizational contexts, including defense resource management and defense planning.

2.3 Strategic foresight methodology

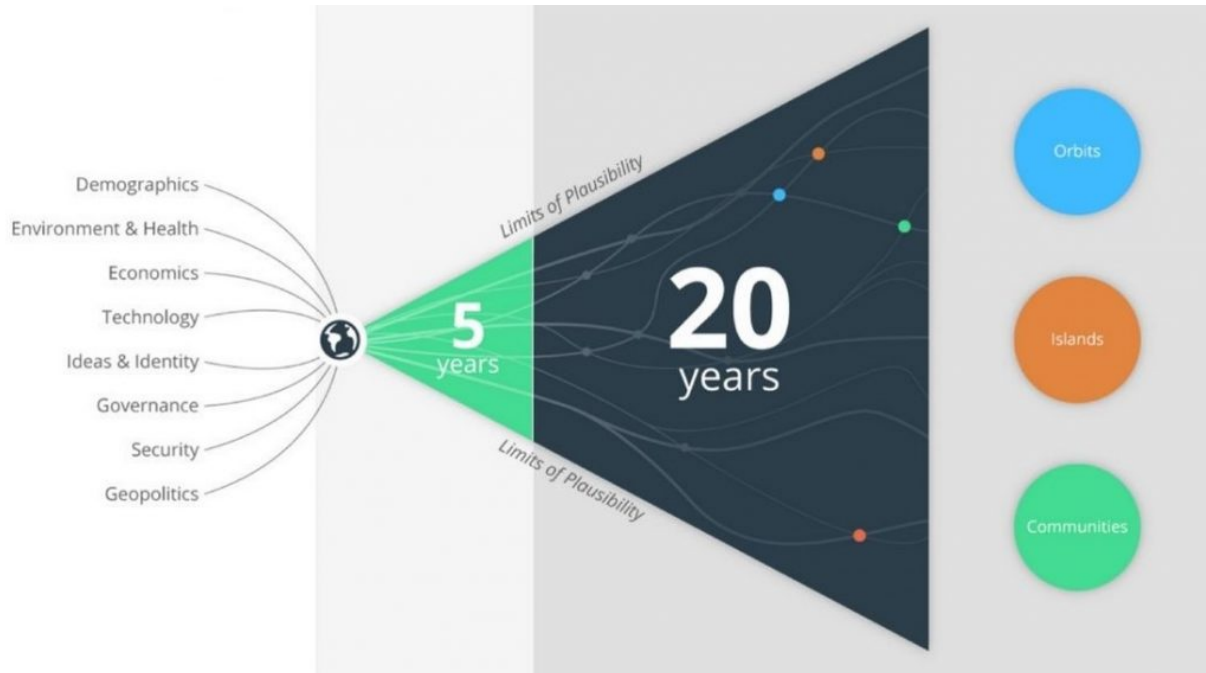
There are a multitude of techniques employed in strategic foresight analysis, still, Javier Jordán, Professor of Political Science at the University of Granada and Director of Global Strategy believes, at its core, all foresight work necessitates four essential elements:^[4]

- The right mindset: Counteracting the tendency to project the present with minimal adjustments, individuals must cultivate a mindset open to disruptive ideas and unconventional thinking. Jim Dator's second law of futures studies underscores the need for futuristic ideas to appear initially absurd, prompting a revaluation of accepted paradigms.
- Understanding the present: Recognizing that no future scenario, even black swan events, materializes without a causal chain originating in the present, foresight work begins with a strategic analysis of the current situation. This involves identifying key actors, patterns, and variables to establish stable trends and uncertainties that shape future possibilities.
- Explore alternative futures by visualizing diverse combinations of identified trends and uncertainties. For instance, construct simple scenarios around two axes, incorporating extreme values of two key uncertainties. Expand the scope by manipulating more variables and exploring various options through a morphological analysis matrix ([examples provided here](#)). Utilize a [futures wheel](#) to depict second and third-order impacts of a specific trend or event, considering multiple dimensions (political, social, economic, technological, etc.). Alternatively, [employ a matrix game](#) to simulate the behavior and strategic choices of key players in a given scenario, generating novel scenarios. Emphasize that the exploration of futures does not seek precise prediction. While expert consultation, such as Delphi, can assign probabilities to changes in trends and uncertainties, leading to a calculation of a cone of likely scenarios with cross-impacts, this remains a quantitative representation of subjective opinions. While systematic and rigorous execution may render it useful, it's crucial to recognize its inherent limitations. In scenario building, the key lies in plausibility—offering a logical explanation for why drivers culminate in a particular scenario, even if it appears surprising. The cone of plausibility, distinct from probability, broadens with an extended time horizon (refer to the image below for the limits of plausibility). As time progresses, the interactions between drivers become increasingly intricate and challenging to anticipate. Nevertheless, maintaining a logical chain to explain driver behaviour remains fundamental throughout the process.



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Cone of plausibility. Source: Office of the Director of National Intelligence, Paradox of Progress.

- Feeding into strategic planning: For strategic foresight to be truly strategic, its conclusions must integrate with the planning process, guiding organizational paths with a continuous feedback loop. This ensures relevance and practical applicability, transforming foresight from an intellectual exercise into a valuable tool for navigating an uncertain future.

In the face of strategic surprises and the complexities of an interconnected world, the temptation to neglect foresight must be resisted. Mapping the future through strategic foresight not only facilitates contingency planning but also enhances comprehension of causal relationships, preventing hasty and uninformed responses to crises. Strategic foresight thus emerges as an indispensable endeavour in a dynamic and uncertain world.

3. NATO and Strategic Foresight Analysis

3.1. Planning for the future

Planning decisions always involve assumptions about future developments. Making decisions in the face of uncertainty is a dilemma that we can never escape and time is an essential factor for every strategy development. Adjusting the course of a consensus-based alliance like NATO in peacetime takes at least years while development, procurement and production of new capabilities can take decades.

Most of the time, our own assumptions about future developments in our personal lives are based on emotions like fear or wishful thinking, prior experiences or simple extrapolations of the status quo. This can lead to suboptimal results in our personal life, such as buying nonperforming stocks or picking an insufficient retirement plan. But it might lead to much more disastrous outcomes for multiple people or even nations if military planning rests on less-than-optimal methods of predicting future threats and challenges.^[5]



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Our adversaries are looking to take advantage of disruptions in the rapidly deteriorating global security landscape, presenting challenges in both cognitive and virtual realms. NATO requires rapid and more relevant adaptation and transformation because competition and conflict have gone beyond the traditional Military Instrument of Power, now extending into the Information domain. To counter these attempts, it is crucial to enhance dialogue between the military and political spheres. Even when there are no wars, our adversaries are actively searching for methods to challenge our use of the Military Instrument of Power.

As the world contends with existential challenges like climate change, navigates the intricate interplay of technological advancements and formidable geopolitical shifts, this foresight analysis emerges as an indispensable compass guiding NATO through uncharted territories, equipping it to navigate evolving threats and bolster global security in an era of unprecedented change.

3.2. Integration of Strategic Foresight Analysis

The Strategic Foresight Analysis (SFA) 2013 Report was the product of initial efforts to establish institutional foresight within Allied Command Transformation (ACT) to provide NATO, national leaders and defense planners with a common perspective of the challenges facing the Alliance in the decades to come.

The Strategic Foresight Analysis series, spanning from 2013 to 2017, has been a cornerstone for shaping collective and Allied defense planning processes. These analyses, integral to understanding future trends, informed the development of the NATO Warfighting Capstone Concept which lays out a strategic vision that will sustain NATO's military advantage over the next two decades. It was endorsed by all NATO nations in 2021.^[6]

Collective defense planning processes can be strengthened through Strategic Foresight Analysis. Strategic Foresight Analysis has played a pivotal role and influenced NATO's strategic trajectory, particularly with the significant restructuring in 2022. NATO's adaptive resilience cannot be achieved without a comprehensive approach that emphasizes the broader spectrum of diplomatic, informational, and economic actions.

The Strategic Foresight Analysis 2023, aimed at predicting security landscapes until 2043, is a valuable tool for assessing the driving forces and uncertainties that impact the Military Instrument of Power.

4. Allied Command Transformation – Strategic Foresight Analysis 2023

NATO Allied Command Transformation has achieved a significant milestone by concluding its most comprehensive futures research in years, resulting in the Strategic Foresight Analysis 2023.

This report will serve as a baseline assessment for subsequent futures research projects, including NATO's Future Operating Environment, which addresses challenges and opportunities of transforming NATO's Military Instrument of Power, in order to remain fit for the future. The analysis, derived from 10 intensive workshops, stands as a collaborative effort that incorporates the insights of over 800 Allied experts. This extensive collaboration ensures a multifaceted view of the future, considering diverse perspectives and expertise. The result is a holistic understanding that addresses fundamental trends shaping our world and potential strategic shocks. The Strategic Foresight Analysis aims to inspire thinking on existing as well as novel problem sets and enable the



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Allied defense planning, warfare development and concept development communities in their long-term considerations. ^[7]

Below are presented the main drivers of change identified by Allied Command Transformation – Strategic Foresight Analysis 2023. ^[8]

4.1. Drivers of change

The most relevant strategic trends were identified, organized into seven drivers of change, which will significantly affect the evolving security environment of the Alliance.

4.1.1 Climate breakdown and loss of biodiversity

Climate change will continue to enhance devastating extreme weather and climate events (hereafter climate extremes) with increasing frequency and severity. There is unequivocal evidence that the impact of climate change is reshaping living conditions on Earth and poses existential threats driven by human activities such as the burning of fossil fuels and deforestation. Rising global surface temperatures due o increased greenhouse gas emissions (GHG) can lead to the increased frequency and volatility of extreme atmospheric conditions, weather events, rising sea levels, and heat stress.

Climate breakdown and loss of biodiversity should be considered as the primary structural force that will have a profound impact on every aspect of the evolving Security Environment. If unchecked, it will act as a threat multiplier, accelerating disruption and pervasive competition and causing further fragmentation. Societal instability, displacement and essential resource insecurity will pose a significant challenge to military operations across all domains as impacts escalate. This is an existential challenge for humanity.

Potential Strategic Shocks:

1. Unexpected climate collapse in multiple countries, severely changing weather patterns and enduring life-threatening conditions, with little to no warning.
2. Increased risks from crop disease and failure in shrinking temperate zones, as extreme weather and loss of biodiversity harm legacy crops and devastate less resilient ones.
3. Sudden emergence of pandemics or collapse of biodiversity as a result of natural causes or human-induced ecocide creating lasting global crisis.
4. Activation of geoengineering of the atmosphere to create disruptive cross-border weather patterns, potentially enabling instrumentalization of the atmosphere and prompting possible pre-emptive responses or conflict.

4.1.2 Resource scarcity

As climate breakdown further degrades vital ecosystems and interrupts the services they provide, the demand for renewable and non-renewable resources and critical raw materials is set to increase,

while the





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competition and dependencies for these resources become more acute. The high demand and scarcity of resources may cause a tipping point whereby competition turns into confrontation.

Potential Strategic Shocks:

1. Confrontation over limited resources ('resource wars') expanding to regional and global levels, attracting major powers or security coalitions with further unintended or calculated escalations.
2. Popular movements revolting against fragile governments as a result of deteriorating environmental conditions, prompting internal conflicts, coups and regional escalation as well as major humanitarian crises.
3. The sudden emergence of vast market asymmetries, as a result of instability or export control disrupting the continuity of resource supply chains, undermining efforts of green energy transition and enhancing competition or confrontation with potential adversaries.
4. Human-induced or natural disasters leading to disruptions to electric grids, on a global scale.

4.1.3 Age of AI: emerging and disruptive technologies converging

The pace of technology transformation will continue unabated. Emerging and Disruptive Technologies will present opportunities and challenges in an age where effects and enhancements will converge across multi-dimensional environments. Convergence of technology will not only be transformative on a societal level in the next 20 years but will also change the character of warfare where military capabilities are increasingly autonomous, networked, multi-domain and precise, and empowering an increasing number of actors. *Potential Strategic Shocks:*

1. Significant political or social unrest triggered by the uncontrolled spread of misinformation, disinformation as a result of AI, big data, and advanced language models.
2. The lack of human oversight and the speed of highly interconnected and automated systems triggering escalation or unintended crises due to highly interconnected systems, operating in a confused security environment.
3. Unanticipated use of any Emerging or Disruptive Technology (EDT) to gain strategic advantage in anticipation of imminent confrontation.
4. Enduring and successfully concealed employment of any EDT with effects of mass destruction.

4.1.4 Geoeconomics, fueling polarization

Economic activity across the globe continues to shift towards Asia whilst established economic systems and global division of labour is still transforming, due to security concerns, digital transformation and rapidly evolving manufacturing and production innovations. Pervasive competition is unfolding amidst major shocks to the global economy. This fuels an increasing level of polarization when both states and the private sector face global decoupling, with weaker states choosing or being coerced between systems, while states authority is being challenged with trust issues that become harder to address.

Potential Strategic Shocks:

1. Major supply chain shock resulting from regional conflict, denied access to resource nodes, or severe trade prohibitions.
2. Actors introducing an export ban on critical rare earth materials or energy resources in a concerted and coordinated fashion.
3. Isolated states conducting disruptive strikes against digital and economic global systems causing global shock in telecommunication, supply flows and industrial activity.



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4. Alternative financial systems emerging and gathering increasing support.

4.1.5 Human networks - empowered

Technology accelerates interconnectivity within groups and individuals increasing their influence in the security environment. It empowers them to pursue their objectives independently from and sometimes in contradiction with state actors. Human networks' ability to adapt rapidly, makes them formidable allies, or foes in the future security environment. Potential Strategic Shocks:

1. Non-state actors openly and declaratively contesting and challenging state authority, or replacing state responsibility in critical services, or acting in the state's stead in international affairs. This may include the sudden removal of any previously provided commercial enabler from a state leading to critical reliance concerns and counteractions.
2. Winning a conflict without fighting through successfully shaping and contesting within the cognitive and virtual dimensions, collapsing national cohesion and severing the military instrument from the society.
3. The exponential spread of any emerging norm, belief, idea, technology or disease across the global human networks.
4. Collapse of a megacity.

4.1.6 Scramble for the commons

Pervasive competition as well as depletion and uneven access of existing resources will drive actors towards the insufficiently governed global commons. Actors will explore and exploit these commons to gain strategic advantage, control or deny access to contest and, if needed, confront. This scramble will require stronger reliance on non-state actors and will be driven by commercial capacities.

Potential Strategic Shocks:

1. Unintended escalation from confrontation of state or state sponsored commercial actors in scrambling for exploration and exploitation beyond national jurisdiction, in the insufficiently governed global commons.
2. Interdiction of naval trade, air traffic, satellite orbits and critical undersea infrastructure in critical nodes or locations with global effects.
3. Autonomous actors imposing paralysis in physical and digital infrastructure by creating strategic disruptions in cyber space, driven by alternative ideologies or beliefs.
4. Any form of kinetic or non-kinetic attack against Allied and major commercial satellite constellations.

4.1.7 International order in transition

Across all aspects of the Evolving Security Environment, pervasive competition will accelerate as strategic competitors of the Alliance adapt to increasing levels of global fragmentation and the erosion of the current international systems. As a result of increasing uncertainty and instability, rivals will position themselves to undermine international norms, shape and contest in peacetime and prepare for confrontation. The relationship between Russia and China is likely to strengthen and smaller states may be exposed to coercion as pervasive competition gathers pace. Formation and solidification of new forms of regional security cooperation and military alliances may become more prevalent.

Potential Strategic Shocks:



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1. A Russian attack against Allied countries or assets or any action by actors to violate territorial sovereignty with overt or covert confrontation.
2. Formation of a military alliance, openly adversarial to NATO.
3. Major war expanding to multiple regions leading to instability, prompting humanitarian crisis and mass migration. Major systemic war is a distinct possibility. Its emergence will be more likely a result of miscalculation (including underestimated NATO reaction) or unintended escalation.
4. Surprise employment of massed autonomous weapons to create an asymmetrical advantage against high-value targets.
5. Nuclear exchange between states.

4.2. Implications to alliance

In a pervasive competition scenario, Diplomatic, Information and Economic Instruments of Power (IoP) could potentially be used to target Allied cohesion, exert influence over sovereign nations, solidify regional security formations and military coalitions, and fuel as well as exploit grievances in areas of instability.

The capacity of potential adversaries and their efficiency to coordinate and employ IoP will increase, while non-military instruments will likely gain more relevance. Potential adversaries will likely prefer to avoid open and direct conflict with the Alliance, due to NATO's advantage in the Military Instrument of Power. Their objectives will reflect that, in attempting to conceal intent and capacity to achieve strategic surprise. These adversaries may introduce plausible deniability to avoid attribution and response, extensive use of emerging and disruptive technologies, cyber warfare to cause lasting damage to critical infrastructure, and robust technology-enabled cognitive warfare designed to undermine unity. These actors will take advantage of their ability to efficiently combine employment of all instruments of power to limit the Alliance's military instrument, already in peacetime.

Main key points emphasized by the analysis:

- The Diplomatic Instrument of Power will be challenged by a great variety of actors, behaviours and attitudes, as well as competing narratives and increasing complexity;
- Allied actions in a congested information environment will face challenges due to the abundance of narratives, AI, and automation complicating detection. Cognitive warfare will play a critical role in shaping public perception and decision making, requiring countermeasures in pervasive competition;
- Gaining an economic advantage over competitors will become a key objective for nations seeking to enhance their power and influence, while retaining an economic advantage will be fundamental to creating resilience against a chaotic future security environment;
- National ability to generate fighting power may become constrained by a wide range of challenges to states, including costs of climate adaptation and green energy transition; keeping pace with accelerating technology changes; and economic, financial and technology limitations. In addition, social dynamics, including the need to reallocate spending to welfare and domestic labour challenges (ageing societies, shortage of skilled workforce) will pose further demands for states resources. At the same time, cost escalation in the defence sector is set to increase further.

4.3. Key challenges to the effective use of Military Instrument of Power

1) Accelerating changes in technology will shape the character of warfare and be characterized by:



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- a. Increasing complexity and confusion of the security environment;
- b. Concealment of intent (due to dual use tech and a dense information environment) will complicate the cognitive component and demand rapidity and agility in decision making, resulting in compressed timelines;
- c. Integration of AI and sensors will enhance detection, attribution and rapid decision making to guide responses;
- d. Increasing speed, scale, range and precision of strikes;
- e. Compressed decision making cycles;
- f. Low-cost, dual use autonomous systems on land, air, and sea will be ubiquitous across the battlespace;
- g. A limited number of high-value autonomous weapons for strategic effects and an exponentially increasing number of low-cost, unmanned and human-machine systems will allow an increasingly contested and degraded security environment for Allied forces;
- h. Emerging technologies include bio-toxins, human enhancement technologies, quantum technology, directed energy weapons, engineered pandemics, and generative AI. These will have the power to wield existential damage to societies. States will be challenged to produce countermeasures that can keep pace with these advancements and be pressed to develop mitigation strategies at pace to respond to these low-probability, high-impact events;
- i. EDTs will make military capabilities increasingly intelligent, interconnected, distributed, and digital in nature.

2) Active shaping and contesting by potential adversaries in virtual and cognitive dimensions will be aimed at disrupting the moral component through:

- a. Cognitive warfare;
- b. The promotion of alternative norms and principles,
- c. A complex congested and confused information environment with a high variety of actors, stakeholders and narratives;
- d. Technology-enabled concealment of capacity and intent increasing legal challenges and complicate attribution

3) The physical dimension will be challenged by a range of factors, which are shaped by the key drivers of change:

- a. The Personnel Element will require adaption due to changing demographics:

- i. Ageing;
- ii. Scarcity of a skilled and available workforce;
- iii. Increasing personnel (human resources) costs.

- b. The equipment element will face:

- i. Accelerating changes in technologies resulting in obsolescence at faster rates;
- ii. A low industrial base for large scale, enduring conflict;
- iii. Challenges for rapidly adopting commercial and dual-usable technologies;
- iv. Cost escalation;
- v. Interoperability challenges;

- vi. An austere operating environment with high attrition rates;

vii. An increasing need to automate and re-balance the quality and quantity of force structures.

- c. The training element will be faced by increasing incremental cost and be resource intensive for a variety of previously unIntroduced conditions, including:

- i. Operating in extreme weather environments;
- ii. Utilization of more advanced technologies in weapons and systems;



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iii. Increasing complexity of multi-domain operations and integrated effects.

d. The Readiness Element will depend on:

i. Availability of sufficient force elements;

ii. Availability of sufficient materiel stockpiles.

Whilst being challenged by:

iii. Strategic distances;

iv. Increasing variability of potential employment and deployment scenarios with no or short notice;

v. Sustainment issues due to a requirement to rebuild a strong industrial base;

vi. Political resolve to continue engagement despite associated costs;

4) Potential adversaries:

a. Likely possess the means to target Allied and social cohesion in peacetime, in order to:

i. Limit the capacity and will to fight;

ii. Disrupt resolve to sustain operations.

b. Will take advantage of insufficient rules and regulations in new theatres of operation and increasingly shift:

i. To the virtual and cognitive dimensions;

ii. Towards insufficiently governed global commons;

iii. To conduct hybrid activities;

iv. Towards actions under plausible deniability and utilizing concealment and proxies.

5) Climate breakdown and rising global temperatures will require:

a. Armed forces to adapt and operate under extreme conditions;

b. Operations in austere environments to increase;

c. Facing climate-related attrition on equipment, forces, and stockpiles, which will lead to higher operating costs; and

d. Extreme weather disruptions which will pose challenges to the safety of navigation and to access to land forces in affected coastal areas.

6) Resource scarcity driving instabilities will require Allied forces to:

a. Accelerate transition to green energy sources to reduce carbon footprint and dependence on fossil fuels;

b. Ensure increased operational effectiveness as a result;

c. Adapt force designs and, as necessary, operational concepts to increase the use of electric vehicles in and around urban areas;

d. Prepare to protect freedom of navigation against novel ways of interdiction as well as to protect critical trade nodes in the global commons, as appropriate.

7) Empowered human networks through Public (State) and Private (commercial) partnerships will become critical enablers for the military instrument. In the modern operating environment:

a. State capacities are insufficient;

b. Commercial services are expanding steadily;

c. Armed forces alone cannot effectively wage modern warfare across multiple domains without substantial support from commercial actors;

d. Trust, reliability and attribution concerns must be resolved;

e. Prevalence of commercial service providers will necessitate a new approach to national security;

f. Future cyber and space commercial service providers will be ubiquitous across the domain. They are not necessarily combatants and may be citizens of third countries.



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8) Scramble for the commons will require a new mind-set, including anticipation and detection as well as modern capabilities by Allied forces to ensure success for missions and operations in a complex, congested, commercialized, contested and confused environment. Areas and actions are as follows:

- a. On the High Seas and Oceans:
 - i. Control and secure trade routes;
 - ii. Counter piracy and maritime terrorism;
 - iii. Protect undersea infrastructure;
 - iv. Utilize unmanned naval drones and advanced sensors.
- b. In the Arctic and Antarctica:
 - i. Increase monitoring of the region;
 - ii. Assert sovereignty and uphold international law;
 - iv. Address climate-related tensions;
 - v. Protect critical supply routes.
- c. In the Atmosphere:
 - i. Reinforce air traffic management;
 - ii. Address emerging threats from drones;
 - iii. Start assessing long-term implications of geoengineering;
 - iv. Prepare and protect against electromagnetic effects.
- d. In the Outer Space:
 - i. Prepare for protecting increasing commercial traffic;
 - ii. Explore ways to manage congestion and debris in orbit;
 - iii. Protect space-based assets and capabilities;
 - iv. Address potential space weaponization in concepts.
- e. In the Cyberspace:
 - i. Defend against cyber-attacks of varying scales;
 - ii. Adapt to evolving tactics and actors;
 - iii. Enhance technological expertise;
 - iv. Collaborate with the private sector for cybersecurity;
 - v. Address governance challenges and vulnerabilities stemming from insufficient regulation as appropriate.

5. Conclusion

More and more organizations want to understand in greater detail how the world is changing and how they can make the most of these changes. The purpose of Strategic Foresight is to help them in that difficult task. And, of course, to ensure that organizations make informed decisions based on carefully analyzed views of alternative future scenarios.

NATO understood the importance of Strategic Foresight and from 2013 when it issued the first report of Strategic Foresight Analysis undertook a series of steps for restructuring the Strategic Foresight Process in order to increase organization adaptability and agility in countering future threats, and ultimately, in 2022, set several objectives, outlined below:

- Establishing a biennial foresight cycle for trends assessment heaving Strategic Foresight Analysis 2023 as a baseline;
- A follow-on analysis expanding the military aspects of the Future Operating Environment of the Alliance in 2024;



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- Develop subsequent foresight studies to analyze long-term challenges and inform long-term capability development;
- Establish a foresight community to modernize forward-looking practices and enhance future collaborative research.

One important aspect derived from the same Strategic Foresight Analysis 2023 published in 2024 is that only efficient coordination across all Instruments of Power (Diplomatic, Economic, Information and Military), efficient aggregation of the Alliance's capabilities, and joint actions in a multi-domain environment will remain fundamental to prevail in a degraded security environment.

The objective of Strategic Foresight Analysis is to encourage thought on both existing and novel problem sets and enable the Allied defense planning, warfare development, and concept development communities to consider their long-term demands. It acts as a stark alert, prompting strategic thinkers and decision-makers to confront potential obstacles head-on.

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**NEW TECHNOLOGIES IN THE CONTEXT OF NATIONAL
SECURITY AND INTERNATIONAL RELATIONS: NATO
BUILDING INTEGRITY (BI) AWARENESS COURSE AS THE
CASE STUDY**

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Abstract:

The purpose of the study is to familiarise the readers with the utility of the new technologies and solutions related to the security ecosystem. During the research conducted it was possible to collect important data on the anti-corruption matters, seen from the Ukrainian perspective and to formulate recommendations on the utility of the e-learning tools for sharing building integrity awareness. Need for the study is based on building integrity realm within Ukrainian security and defence environment and relates with the opportunities offered by the e-learning tools to reach the large number of persons on-line to take the e-learning courses. As the background of the research activities, it is needed to mention about the Decree of the President of Ukraine of June 20, 2023, No. 344/2023. Deputy Head of the National Agency for the Prevention of Corruption was appointed National Coordinator for Ukraine's Cooperation with NATO in the Field of Integrity Building. To ensure the implementation of its powers in shaping anti-corruption policy regarding integrity in the security and defence sector, the National Agency runs the Directorate for Shaping Integrity Policy in the Security and Defence Sector. Considering the fact that joining the North Atlantic Alliance is a priority task for Ukraine, and reforms aimed at building integrity include introducing modern management standards, ensuring independence from political interference, increasing employee professionalism, investing in education and training of personnel, the National Coordinator for Ukraine's Cooperation with NATO in the Field of Integrity Building informed the entities about the possibility of completing/passing an online course developed by experts of the NATO and translated into Ukrainian. He stated that this course was mandatory for NATO military and civilian personnel, as it provides general knowledge about integrity and good governance education in NATO member states. During the course, participants can familiarize themselves with basic knowledge about integrity and good governance education. After successfully completing the course, each participant can receive a personalized certificate at the end. This course has been accessible, from the beginning of June 2024, on the NATO DEEP ADL Portal, while the solution/approach which is the result of the collaborative efforts involving two institutions of the Defence and Security Cooperation Directorate of Operations Division: (1) Governance and Institutions, (2) Defence Education Enhancement Programme and the NATO Representation in Ukraine (NRU). Introduced methodology is mainly based on collecting data while using functionalities offered by the NATO DEEP ADL Portal - satisfaction survey consisted of eight questions. To date (01 September), more than 113,000 participants have completed this format, including members of the Armed Forces of Ukraine, the Ministry of Defence of Ukraine, the Ministry of Internal Affairs of Ukraine, the National Guard of Ukraine, the State Border Guard Service of Ukraine, the National Police of Ukraine, the State Emergency Service, the Security Service of Ukraine, and many other institutions. The National Agency of Corruption Prevention and the national coordinator for NATO BI policy implementation have significantly promoted the course among relevant institutions. Since participants completed the course, data had been collected within satisfactory survey and processed, accordingly. The practical implications are of utmost importance, allowing for introducing this approach in case of other elearnig courses.

Key words: NATO, Building Integrity, Ukraine, security environment, e-learning, DEEP



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1. Introduction

To ensure an effective educational process in Ukraine and the South Caucasus, it is crucial to implement and develop robust management mechanisms, allocate resources wisely, continuously enhance intellectual resources, refine military educational programs, improve educational assets, and adopt modern learning and evaluation methods. Prioritizing the ongoing integration of scientific approaches in military educational program development is essential. This involves comprehensive processes such as analysis, planning, development, performance, and evaluation [Iskandarov, Gawliczek, pp. 35-44].

Achieving these objectives presents significant challenges for any single nation and requires practical support. NATO's Defence Education Enhancement Programme (DEEP) plays a pivotal role in this context. The NATO DEEP utilizes the Advanced Distributed Learning (ADL) Portal to facilitate the modernization of professional military education by offering a centralized platform for sharing and developing online courses. This portal acts as both a repository for existing courses and a collaborative space for course designers to share expertise [Iskandarov, Gawliczek, pp. 35-44]. By addressing the specific needs of partner nations through customized faculty and curriculum development, DEEP promotes standardized, technology-driven approaches to military education that enhance interoperability and institutional self-sufficiency. This strategy aligns with NATO's commitment to integrating innovative technologies to strengthen defence education and governance [Gawliczek, pp. 111-119].

DEEP has become an essential partner in supporting institutional reform and enhancing professional military education (PME) in the Ukraine and South Caucasus. Its approach combines curriculum development, faculty training, and e-learning tools to modernize military education according to international standards. Education serves as a transformative agent, with NATO leveraging it to support institutional reform in partner countries. The integration of modern e-learning tools through NATO DEEP's ADL Portal has significantly expanded outreach and facilitated the sharing of critical expertise. These tools foster innovative learning experiences for both students and instructors, promoting interoperability and professionalization within armed forces [Iskandarov, Simons, Gawliczek, pp. 7-34].

NATO's education and training programs have evolved from a narrow focus on interoperability to comprehensive frameworks that support the modernization and reform of defence education institutions. By collaborating with NATO, South Caucasus countries gain access to specialized courses, seminars, and expertise that strengthen their ability to align with NATO standards and contribute to joint operations. The South Caucasus nations continue to play a vital role in NATO operations and missions. By utilizing NATO DEEP and related initiatives, they can enhance their defence institutions, adopt best practices in education and governance, and make meaningful contributions to regional and global security efforts.

The NATO DEEP Programme is a cornerstone of Ukraine-NATO collaboration. For over 12 years, it has supported nearly all educational institutions within Ukraine's security and defence sectors [Birchenko, pp. 11-15]. DEEP's mission is to drive institutional reform by modernizing military education through a three-pronged approach:

1. Curriculum Development: This includes revising existing curricula and designing new courses on logistics and defence planning, facilitated by NATO instructors.
2. Faculty Development: DEEP exposes Ukrainian instructors to modern teaching techniques, from lesson planning to student assessment, ensuring the highest standards.
3. Institutional Reforms: Advising military academies on structural and financial management aligns their practices with NATO standards and the Bologna Process.



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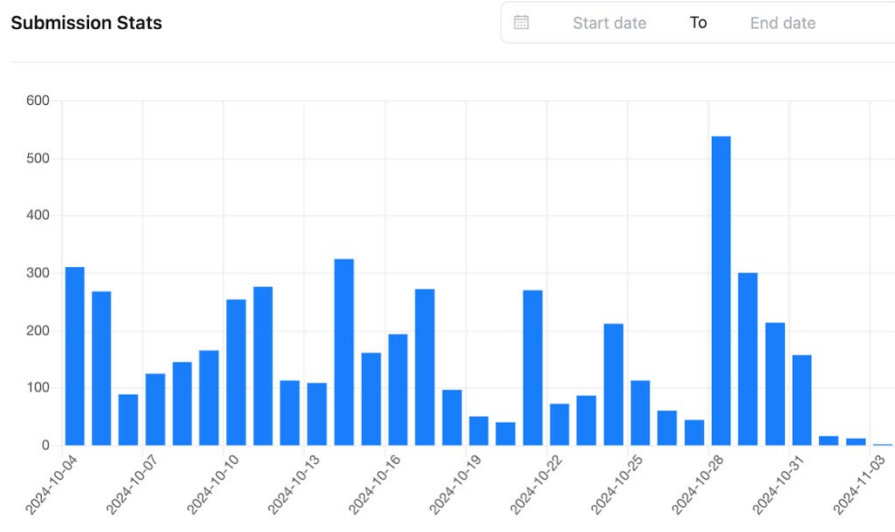
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2. NATO Building Integrity (BI) Awareness Course

Since its inception, DEEP has trained over 15,000 Ukrainian instructors and students in NATO methodologies [Birchenko, pp. 11-15]. Online learning initiatives have further expanded the program's reach, particularly during the COVID-19 pandemic and ongoing conflicts. A significant milestone was achieved in June 2023 with the Decree of the President of Ukraine (No. 344/2023), appointing a Deputy Head of the National Agency for the Prevention of Corruption as the National Coordinator for Ukraine's cooperation with NATO on integrity building. The course, which is part of the NATO BI Awareness curriculum, was made mandatory for NATO personnel and accessible to Ukrainian participants, thereby enhancing the institutional capacity in areas such as independence from political influence, professionalism, and anti-corruption. The NATO's Building Integrity (BI) program provides a suite of educational tools, including the NATO Building Integrity Awareness Course. The course, jointly developed within DEEP, was introduced on the NATO DEEP ADL portal, an essential platform for distance learning and knowledge exchange. The translation of the course into Ukrainian allowed for broad participation across various defence and security institutions, with approximately 125 519 Ukrainian participants completing the course by 2nd November 2024. The National Agency of Corruption Prevention, Ukraine's national coordinator for NATO BI policy, has actively promoted the course, contributing significantly to its success and widespread adoption.

3. The Course Submission Statistics²



The data for this study were collected through satisfaction surveys administered via the NATO DEEP ADL portal. The survey, comprising eight questions, gathered insights on the effectiveness of the course and participant satisfaction. The participant base spans numerous Ukrainian defense and security entities, including the Armed Forces of Ukraine, Ministry of

² All statistical data referenced in this document originate from the Building Integrity e-learning course, accessible via the NATO DEEP ADL Portal (deeportal).



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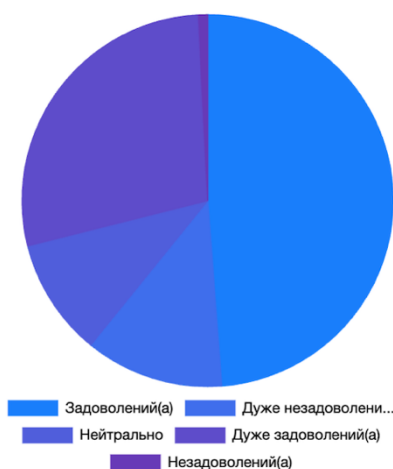


Defence, Ministry of Internal Affairs, National Guard, State Border Guard Service, National Police, State Emergency Service, Security Service of Ukraine, and other institutions.

4. Satisfaction Survey – dedicated questions and answers

Question. 1 - How satisfied are you with the information you received during this course?
The answers ranged from ‘very satisfied’ to ‘dissatisfied’

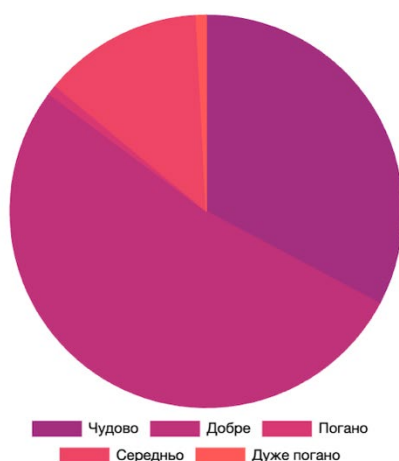
Питання 1 – Наскільки ви задоволені тією інформацією, яку отримала завдяки даному курсу?



Label	Total	%
Задоволений(а)	26900	48
Дуже задоволений(а)	15502	28
Дуже незадоволений(а)	6645	12
Нейтрально	5641	10
Незадоволений(а)	441	0

Question 2 - How would you rate the clarity and structure of the course content?
The answers ranged from ‘Good’ to ‘very bad’

Питання 2 – Як би ви оцінили чіткість та структуру змісту курсу?



Label	Total	%
Добре	28909	52
Чудово	18065	32
Середньо	7241	13
Погано	461	0
Дуже погано	453	0

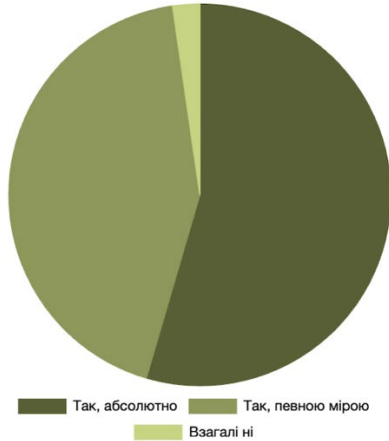
Question 3 - Did the course meet your expectations?
The answers ranged from 'Yes, absolutely' to 'Not at all'



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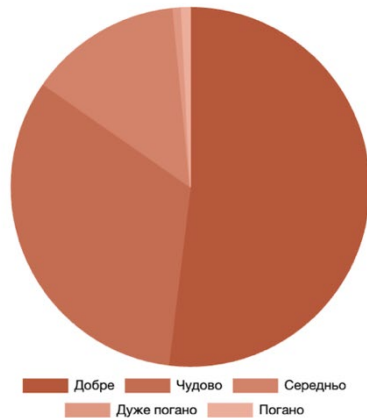
Питання 3 – Чи даний курс зміг задовільнити ваші очікування щодо нього?



Label	Total	%
Так, абсолютно	30058	54
Так, певною мірою	23811	43
Взагалі ні	1260	2

Question 4 - How would you rate the accessibility and usability of the NATO DEEP ADL Portal?
The answers ranged from 'Good' to 'Not good at all'

Питання 4 – Як би ви оцінили доступність та зручність використання освітнього порталу NATO DEEP ADL Portal?



Label	Total	%
Добре	28632	51
Чудово	18054	32
Середньо	7588	13
Погано	439	0
Дуже погано	416	0

Question 7 - Would you recommend this online course and the NATO DEEP ADL Portal to others?

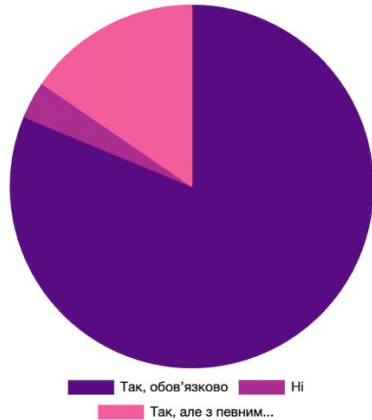
The answers ranged from 'Yes, of course' to 'Not at all'



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Питання 7 – Чи порекомендували б цей онлайн курс та освітній портал NATO DEEP ADL Portal іншим?



Label	Total	%
Так, обов'язково	44795	81
Так, але з певними застереженнями	8501	15
Ні	1833	3

The survey data indicate that the course was well-received among participants, providing essential knowledge on integrity and governance in line with NATO standards. The satisfaction survey reveals strong engagement from defense institutions, underscoring the demand for scalable e-learning solutions to enhance integrity across sectors. Additionally, the success of this model highlights the potential for replicating similar initiatives within other educational programs facilitated by NATO DEEP.

The NATO Building Integrity Awareness Course is designed to be easily accessible to participants, ensuring that personnel from various institutions can join without difficulty. Upon successful completion, participants receive a personalized certificate. This structured approach ensures that each step of the process is straightforward, making the course accessible even for those with limited experience in online learning platforms.

5. Step by step view of course participant

7. Survey regarding the organisation/unit and status.



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NATO BI Awareness Course in Ukrainian

What is your Ukrainian Organisation/Unit? – Який орган ви представляєте? *

- ☐ Ministry of Defence – Міністерство оборони України
- ☐ Building Integrity Training and Education Center – Науковий центр проблем виховання доброчесності та запобігання корупції
- ☐ Ministry of Internal Affairs – Міністерство внутрішніх справ України
- ☐ National Police – Національна поліція
- ☐ National Guard of Ukraine – Національна гвардія України
- ☐ State Border Guard Service – Державна прикордонна служба
- ☐ State Emergency Service – Державна служба з надзвичайних ситуацій
- ☐ National Agency of Corruption Prevention – Національне агентство з питань запобігання корупції
- ☐ Ukrainian Defence Industry (UKROBORONROM) – Акціонерне товариство «Українська оборонна промисловість»
- ☐ Security Service of Ukraine – Служба безпеки України
- ☐ National Academy of Security Service – Національна академія служби безпеки України
- ☐ Educational establishments under MOI – Навчальні заклади системи МВС
- ☐ Other (please specify) – Інше (прошу вказати)

Other (please specify) – Інше (прошу вказати)

What is your status? – Який ваш статус? *

- ☐ Military – Військовий
- ☐ Civilian staff – Цивільний
- ☐ Temporary Staff – Тимчасовий персонал
- ☐ Intern – Інтерн
- ☐ Contractor – Контракт

SUBMIT – ВІДПРАВИТИ

8. Link to the ILIAS Page to access the course

NATO BI Awareness Course in Ukrainian

Курс з ознайомлення з ВІ НАТО українською мовою

Thank you for participating in the survey!

Here is a link to the NATO BI Awareness Course in Ukrainian. Please note that the training does not save participant progress and is expected to take approximately **60 minutes** to complete. Please allocate the appropriate amount of time for this course.

https://deepportal.hq.nato.int/iliass/goto.php?target=sahs_28531&client_id=DEEP

Дякуємо за участь в опитуванні!

Ось посилання на ознайомчий курс НАТО з розвідки українською мовою. Будь ласка, зверніть увагу, що тренінг не зберігає прогрес учасника і, як очікується, займе приблизно **60 хвилин**. Будь ласка, виділіть відповідну кількість часу для цього курсу.

https://deepportal.hq.nato.int/iliass/goto.php?target=sahs_28531&client_id=DEEP

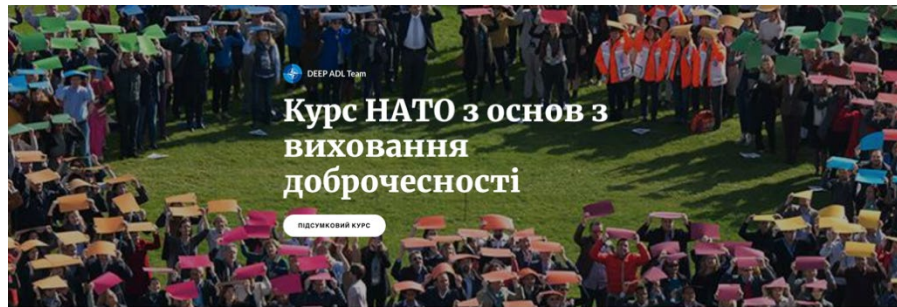
9. Course access through ILIAS

ADL 336 - UKR - Курс НАТО з основ з виховання доброчесності	
Info	Learning Progress
View	
General	
Language	Ukrainian

10. Course main page.



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Курс НАТО з основ з виховання доброчесності
НАСТУПНИЙ КУРС

МЕТА:
Проінформувати цільову аудиторію щодо корупційних ризиків та їхніх наслідків на успішність проведення місії і надати вичерпну інформацію стосовно корупції і концепцій та інструментів з виховання доброчесності для зміцнення професіоналізму та ефективності діяльності Структур НАТО та відповідних національних інституцій.

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Військовий та цивільний персонал на стратегічному та операційному рівнях Структур командування НАТО та Силівих структур НАТО, у тому числі тактичний рівень штаб-квартири. Штаб-квартира НАТО, Агенції, цивільний та військовий персонал, члени Альянсу та країни-партнери.

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- Важливість озвучення елементів з виховання доброчесності на усіх етапах планування та реалізації

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 DEEP Programme DEEP eAcademy DEEP Portals Newsletter

Generate the Certificate of Completion – Згенеруйте сертифікат про завершення

You successfully completed the NATO BI Awareness Course in Ukrainian! Below, you can find the form to create your certificate. – Ви успішно завершили курс НАТО з розвідувальної діяльності українською мовою! Нижче ви можете знайти форму для створення вашого сертифікату.

Name on the certificate – Ім'я в сертифікаті **(Required)**

Please enter the name that will be displayed on the certificate – Будь ласка, введіть ім'я, яке буде відображено на сертифікаті

0 of 35 max characters

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12. Exemplary Certificate of completion



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NATO DEEP eAcademy

CERTIFICATE OF COMPLETION

This is to certify, that

John Doe

has successfully completed the

NATO BI Awareness Course in Ukrainian

NATO DEEP eAcademy Director

NATO DEEP Coordinator

Piotr GAWLICZEK

Mariusz SOLIS

6. Conclusions

The collaborative efforts between NATO DEEP, the NATO BI program, and Ukrainian institutions mark a significant stride toward enhancing integrity and transparency in Ukraine's defence sector. Through e-learning, the program has achieved substantial outreach and engagement, paving the way for further educational reforms aligned with NATO's standards. NATO's ongoing commitment to supporting Ukraine's institutional modernization through DEEP and other projects ensures a resilient and adaptable military education system that meets contemporary challenges. This model demonstrates the impact of coordinated efforts in achieving educational and governance reform and may serve as a framework for future integrity-building initiatives across partner nations. As part of its commitment to fostering international cooperation, NATO is translating this course into Arabic for deployment within Iraq's e-learning portal under the DEEP program. This extension signifies another step forward in promoting governance reforms aligned with international standards. In conclusion, the integration of NATO BI course within DEEP program has proven to be a functional and impactful solution. By combining innovative educational methods, institutional collaboration, and localized content, NATO has established a robust framework for enhancing governance and integrity. This model offers a replicable blueprint for other nations seeking to strengthen their defence and security sectors, contributing to global stability and cooperation.

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**THE EU’S SECURITY AND DEFENSE POLICY IN THE NEW
GLOBAL CONTEXT**

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Abstract:

This paper analyzes the EU’s Common Security and Defense Policy (CSDP) launched in the late 1990s and investigates its challenges in the new tense global context. Russia – Ukraine war and the conflicts of the Middle East (more exactly between Israel and Hamas, Israel and Hezbollah and Israel and Iran) are presented in the light of their impact on European security, along with the relationship between EU and NATO. The paper concludes with envisaging some economic perspectives for the near future in the aftermath of all this widespread instability and unprecedented violence.

Key words: security; defense; Russia-Ukraine war; Middle East conflicts; EU Common Security and Defense Policy;

1.Introduction

This paper tries to examine the EU’s security and defense policy as a response to different challenges of the global context, with reference to the present Russia-Ukraine war and the conflict escalation in the Middle East. The aim is to envisage some economic perspectives in the near future in the aftermath of this unprecedented international situation.

For achieving the above-stated goals, the paper is organized as follows: the next section presents the main stages of construction of a Common Security and Defense Policy; then the challenges of this policy are emphasized for the present tense global context, insisting on the war between Russia and Ukraine, and the conflicts between Israel and Hamas, Israel and Hezbollah and Israel and Iran; the last section shows the concluding remarks.

2.The main stages of construction of a Common Security and Defense Policy

The Common Security and Defense Policy of the European Union, unlike other policies such as development assistance, humanitarian aid, trade, or enlargement, is not yet deeply integrated and shared by all member states.

The beginnings of the European Community were not marked at all by a common security and defense policy. Then military issues evolved and became major concerns, as presented by Box 1 (for the evolution of EU security and defense policy in different stages of the international context, see Tache, 2015).



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Box 1: Brief chronology of the Common Security and Defense Policy

1948: United Kingdom (UK), France and Benelux sign the Brussels Treaty of mutual defense.

1949: The North Atlantic Treaty is signed by US, Canada and ten West European countries.

1952: The six members of the European Coal and Steel Community (France, Germany, Italy, Belgium, Netherlands and Luxembourg) sign the European Defense Community Treaty, which would have created an European army. Unfortunately, in 1954, the Treaty is rejected by the French National Assembly.

1954: On the basis of the Brussels Treaty, The Western European Union (WEU) is created, expanding to include Italy and West Germany and including a mutual defense clause. In the same year, West Germany joins NATO.

1986: The Single European Act (SEA) is signed, containing Title III of the European Political Cooperation (EPC). The EPC can discuss the political and economic aspects of security.

February 1992: With the signing of the Maastricht Treaty, the EPC is replaced with Common Foreign and Security Policy (CFSP).

June 1992: The end of the Cold War and the subsequent conflicts in the Balkans showed the need for the EU to assume responsibilities in the field of crisis management and conflict prevention. The Petersberg Declaration establishes that the WEU will assume humanitarian and rescue tasks, peacekeeping and crisis management tasks (Petersberg tasks). These tasks were integrated in 1999 in the Amsterdam Treaty.

1994: A NATO Summit agrees that the NATO assets can be used by the WEU.

1997: The signing of the Amsterdam Treaty includes reforms of the CFSP.

1999: At Cologne European Council the EU member states reaffirm the EU's willingness to develop capabilities for autonomous action, backed by credible military forces. In the same year, the Helsinki European Council sets the goals for the common security and defense policy (CSDP).

2001: The EU Satellite Centre is created for supporting early warning and crisis monitoring functions of the CFSP and CSDP.

March 2002 – June 2003: Convention on the Future of Europe drafts a constitutional Treaty, creating a European external action service (EEAS) and a European armaments, research and military capabilities agency.

2003: The Berlin Plus Agreement contains a package of arrangements between EU and NATO that allows the EU to use NATO assets for EU-led crisis management operations.

2004: The agreements made since 2002 were incorporated in the draft of the constitutional Treaty and many are implemented without Treaty ratification (excepting the foreign minister and the EEAS).

2007: The post of foreign minister is renamed High Representative of the Union for Foreign Affairs and Security Policy.

2009: The Treaty of Lisbon comes into force and can be considered a cornerstone in the development of CSDP.

2016: In June, Federica Mogherini, the former High Representative and Vice-President of the European Commission, presents the “Global Strategy for the European Union's Foreign and Security Policy.” This strategy includes a complex package of measures in the areas of security and defense, stressing the Europeans' ambition to take more responsibility for their security and defense.



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2017: The Permanent Structured Cooperation (PESCO) is established, with the aim of deepening the defense cooperation between EU countries. In the same year, the European Defense Fund (EDF) is created for supporting the collaboration in defense research.

2021: The European Peace Facility (EPF) is established in order to expand EU's capability to assure security for its citizens and its partners.

2022: A Strategic Compass for Security and Defense is issued, providing a shared assessment of the strategic environment in which EU operates and of the threats EU confronts.

Source: Tache (2015) and European Union External Action (2022), “The Shaping of a Common Security and Defense Policy”, available at: https://www.eeas.europa.eu/eeas/shaping-common-security-and-defence-policy_en

Challenges of the Common Security and Defense Policy in the present tense global context

Russia-Ukraine war and its implications for the European security

The EU supports Ukraine and its people and strongly condemn Russia's brutal military aggression, considering illegal the annexation of the cities Donetsk, Luhansk, Zaporizhzhia and Kherson.

In response to Russia's invasion, the EU adopted a lot of sanctions, with the aim of weakening Russia's economic base and its ability to finance military actions. Sanctions were also adopted against Belarus, Iran and North Korea as a consequence of their support for Russia. The visa facilitation agreement between EU and Russia was suspended.

The EU took important measures for supporting Ukraine such as:

- Economic and financial assistance
- Civil protection support
- Military support
- Reception of refugees through the EU temporary protection mechanism
- Support in the reconstruction of a democratic Ukraine (European Council, Council of the European Union, 2024).

Joseph Borrell, the High Representative of the European Union for Foreign Affairs and Security Policy and Vice-President of the European Commission, argued, in January 2024, that Ukraine prevailing against the Russian aggression is the best security guarantee for Europe and that a paradigm shift is needed from supporting Ukraine for “as long as it takes” to committing to “what it takes” for Ukraine to achieve victory (European Union External Action, 2024).

The conflict between Israel and Hamas, Israel and Hezbollah, and Israel and Iran

The EU policy towards Israel-Palestine conflict had been much discussed in the literature over the years. An interesting contribution was recently added by Akgül-Açıkmeşe and Özel (2024), showing that over the decades the European Union has aimed at solving the conflict between Israel and Palestine through its Foreign and Security Policy, with the “two state solution” as the overarching principle for conflict resolution. These authors state that this policy has been ineffective due to the contextual interplay of multipolar competition, regional fragmentation and even EU-level internal contestation. The EU has indeed used some mitigation strategies, as for example:

- Delegation as an institutional measure through the Common Security and defense Policy missions, or
- Selective engagement as a functional measure through the trade with both partners
- Policies of humanitarian aid for mitigating the impact of different constraints.



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However, none of the EU actions, as the above-mentioned authors show, have adequately alleviated the problems of the region. In the present context, the relations between Israel and Palestine are at a historical low and very worrying for the entire region, leading to an escalation of the conflict in the Middle East.

The situation is equally complex and dangerous as regards the conflict between Israel and Hezbollah, an Iran-backed militant group and political party based in Lebanon. Joseph Borrell, the High Representative of the European Union, condemned the Israel attacks in Lebanon, considering that they forced civilians to pay an unacceptable price. This declaration was made after an informal meeting of EU foreign ministers ahead of the United Nations General Assembly in New York (Politico, September 24, 2024).

Iran's recent missile attack was largely thwarted by Israel but led undoubtedly to an uncontrollable regional escalation. The European Union, together with the United States, have already imposed sanctions on Iran for helping Russia with arms in the war with Ukraine, for suspected nuclear weapons program and for human rights violation. At the EU level, the problem is that there is not a common, shared position towards the Middle East issues. Countries like Spain, Ireland or Belgium are more in favor of Palestine, and others, like the Czech Republic and Hungary support the Israel side.

3. Conclusion

The consequences of the present conflicts unfold on multiple areas, involving both the security level and the economic sector.

The war in Ukraine means a huge loss of human capital, destruction of production capacity, damage of agricultural trading infrastructure and a significant reduction of private consumption. The economic sanctions applied by the EU affected the Russian oligarchs and members of the Russian government.

As regards the Middle East, the deteriorating situation in this region will affect mostly the energy markets, as this region has a major influence on the global oil and gas production. The disequilibria could extend then from oil to precious metals, currencies, stocks and even new, renewable energy.

The escalating conflicts determine also an increase of global inflation, bringing uncertainty and challenging the United States Federal Reserve's agenda for interest rate reductions.

In the present globalized environment, military conflicts transcend the borders of individual countries and become international concerns.

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**DEFENSE RESOURCE MANAGEMENT IN THE COUNTRY OF
GEORGIA**

TAVSHAVADZE Imeda

Ministry of Defense, Georgia

Abstract:

Defense Resource Management (DRM) is a crucial component of military and defense organizations around the world, ensuring that resources are allocated efficiently to achieve operational objectives in an effective way. This paper examines the evolution of DRM, highlighting the contributions of figures like Robert S. McNamara and the adoption of innovative practices such as Program Planning Budgeting System (PPBS). Within the Georgian Ministry of Defense (MOD), DRM has undergone significant reforms, including the implementation of program-based budgeting and collaboration with international partners.

Key words: Defense Resource Management (DRM); PPBS; crucial component; effective and efficient; allocation resources; Robert S. McNamara MOD; collaboration

1.Introduction

Effective Defence Resource Management (DRM) is a crucial component in the success of any military or defence organization. DRM ensures that the resources allocated to the organization are used efficiently and effectively to achieve the desired operational objectives. It involves a range of activities, including financial planning, budgeting, procurement, human resource management, logistics, and infrastructure development.

DRM is not just about allocating resources; it is also about making strategic decisions that ensure optimal utilization of scarce resources, such as funds, personnel, equipment, and facilities. These decisions are guided by the organization's priorities, threat assessments, operational requirements, and budgetary constraints. When done correctly, DRM maximizes the impact of defence resources on national security while minimizing waste and inefficiency.

Therefore, a robust DRM system is necessary for any military or defence organization to succeed. It guarantees that the organization is well-equipped to face any challenges that may arise and can allocate its resources efficiently to achieve its objectives. By implementing an effective DRM system, military and defence organizations can be confident that they are doing their part to maintain national security.

The aim of this final study is to emphasize the importance of Defence Resource Management (DRM) in the Georgian military. It will explore the history of its development, its current position within the Ministry of Defence (MOD), and the opportunities and challenges it faces while carrying out long-term planning procedures. The knowledge gained from this paper will emphasize how vital efficient DRM is and how military and defence institutions must prioritize it to ensure a sustainable future.

2.Shortly About The History of DRMS



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“My own strong belief is a manager should be an aggressive leader, an active leader, asking questions, suggesting alternatives, proposing objective.... “ Robert S. McNamara.

Robert S. McNamara was a key figure in the corporate world and played a critical role in shaping defence resource management (DRM) during his tenure as the Secretary of Defence for the United States from 1961 to 1968. McNamara was known for his innovative management practices, which were often referred to as "McNamara's Management Revolution". Before becoming the Secretary of Defence, McNamara served as the President of the Ford Motor Company and earned the nickname "Whiz Kid" for his analytical prowess. President John F. Kennedy recognized his expertise in organizational management and appointed him to the position. As Secretary of Defence, McNamara introduced a systems analysis approach to defence planning, emphasizing the use of quantitative methods and cost-benefit analysis in decision-making processes. He sought to apply principles of rational planning and management to the defence establishment, with a focus on maximizing the effectiveness of military spending while minimizing waste.

At that time, the main approach to government budgeting was line-item budgeting. This method involved classifying expenses into specific categories or line items like personnel, operations, and maintenance. However, this approach was not transparent and did not provide a clear connection between budget allocations and desired outcomes or objectives. One of McNamara's most significant contributions was the implementation of Program Planning Budgeting System (PPBS) within the Department of Defence (DoD). This approach involved linking budget allocations directly to specific programs and objectives, rather than traditional line-item budgeting.

McNamara acknowledged that effective defence resource management is crucial to enhancing military capabilities and readiness. However, the allocation of resources is a complex process influenced by a range of factors, such as strategic priorities, operational requirements, technological advancements, and fiscal constraints. To overcome these challenges, decision-makers must prioritize resource allocation based on strategic objectives, operational requirements, and emerging threats, carefully weighing competing priorities to ensure the optimal use of resources in achieving military readiness and capabilities.

McNamara emphasized the importance of accountability and performance measurement in enhancing efficiency and accountability to reach maximum effectiveness within the defence establishment. In summary, Robert S. McNamara's role in defence resource management was characterized by his innovative approach to modernizing Pentagon management practices. Through initiatives such as Program Budgeting and a focus on accountability and metrics, McNamara sought to maximize the efficiency and effectiveness of defence spending, leaving a lasting imprint on the field of defence management.

3.DRMS in The Georgian Ministry of Defense (MOD)

Over the years, the Ministry of Defense's resource management system has experienced substantial modifications. Program-based budgeting was initially implemented in 2006 as a result of an agreement between the Georgian MOD and the Kingdom of the Netherlands MOD.

As a result, training sessions launched for the first time in 2007-2008. In 2009, the Ministry of Defense signed an agreement with “VIPD International,” a Dutch company, to improve the qualifications of its civil servants in planning, programming, and budgeting. Accordingly, around 70 military and civilian employees, including decision-makers and the management team, received training between 2009-2010 in order to ensure the success of the project implementation.

The table below illustrates how military demands were converted into the Defense budget according to the budget classifications before MOD started reforms.



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MOD Budget Classification

Code	Classifier
2	Expenses
2 1	Salary
2 2	Goods and services
2 2 1	Salary of non-staff workers
2 2 2	Business trip
2 2 3	Office expenses
2 2 4	Representative expenses
2 2 5	Meals expenses
2 2 6	Medical expenses
2 2 7	Expenses related to the acquisition of textile products, uniforms and personal hygiene
2 2 8	Expenses related to exploitation and maintenance of transport, equipment and weapons
2 2 9	Expenses related to acquisition of military equipment and ammunition
2 2 10	Other goods and services
2 6	Grants
2 7	Social security
2 8	Other expenses
31	Non-financial assets
31 1	Fixed assets
31 1 1	Buildings
31 1 2	Machines and inventory
31 1 3	Other fixed assets
31 2	Material supplies
32	Financial assets
33	Liabilities

Table N1 - MOD Budget classification, before Program budget

Moreover, from 2011 to 2013, the MOD of Georgia and the US Department of Defense collaborated on an initiative to enhance the expertise of personnel working in the field of resource management. As part of this effort, the Defense Institutional Development Group (DIB team), comprising American advisors, conducted a series of 19 work seminars. These seminars covered a wide range of topics, including defense planning, managing human and material resources, strategic planning, doctrine development, procurement planning, and defense market research. The seminars were designed to equip the attendees with practical skills and knowledge to manage resources more effectively and efficiently.

As a result of this, the MOD of Georgia has taken significant steps to ensure that the budget planning and implementation process is well-organized and efficient. They have achieved this by institutionalizing the process within the framework of the country's basic data and directions document (BDD). The BDD line-up with National Security Concept of Georgia reflects the medium-term development plans of the different ministries of Georgia, and it is developed in coordination with the Ministry of Finance of Georgia and approved by the Government of Georgia. The defense program budget is a critical component of the BDD, and it is carefully considered during the development of the programs. The Ministry of Defense designates responsible persons who plan and implement the measures within the program. This system of management ensures that the implementation of the financial management and control system is simplified and streamlined.



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Through these efforts, the MOD can effectively manage its budget and ensure that its programs align with the country's development plans.

Furthermore, the MOD of Georgia expressed its willingness to participate in the implementation of the Financial Management and Control System (FMC) in February 2016. The need for this system arose from Article 279 of the Association Agreement, which obliges the European Union to assist Georgia in reforming its public finance management, as well as the recommendations made in the third round report of the OECD Anti-Corruption Network and the Law of Georgia "On State Internal Financial Control".

As part of the reform, the system operating in the MOD underwent a thorough evaluation. Within the framework of the FMC, the process of allocating responsibilities was formalized, resulting in the establishment of a three-level management system. At the top of the system, there are program heads who are responsible for the overall management of the program. Below them are coordinators who ensure that the program is implemented efficiently and effectively. Finally, budget holders are responsible for managing and allocating financial resources for the program.

The minister's order appointed individuals to these positions and clearly defined their functions and duties. The creation of this system has improved financial management and control within the MOD, making it more transparent and accountable.

Therefore, the resource management system has undergone significant changes in terms of regulatory, legal, and conceptual frameworks. To enhance this process, the Georgian Defense and Readiness Program (GDRP) institutionalized the budget planning and execution process as one of the directions of the resource management effort line. This began in 2020 and was further detailed in the Resources Policy Guide (RPG).

The RPG align with the Ministry's Vision and Strategic Defense Review documents, provides a comprehensive manual that outlines the principles of planning and management of defense resources. It also describes the main stages of budget development and the roles and responsibilities of the various structural subdivisions of the Ministry system involved in the process of budget development and execution.

To achieve this, GDRP defined a line of efforts that began with an analysis of the existing training programs in the field of resource management. Workshops were then planned, and various topics were defined to address the identified gaps. Defense resource management workshops/trainings were held for the structural subdivisions involved in the defense resource management process to ensure that they are equipped with the necessary knowledge and skills to effectively manage and allocate the available defense resources.

The RPG significant important in the defense resources planning process of the ministry. It serves as a comprehensive guide for short to medium-term planning, emphasizing the priorities outlined in the country's strategic document. This document provides all-important recommendations and guidelines to program managers, coordinators, and budget holders, which are crucial in supporting the budget development process for the current year. The RPG also contains a detailed analysis of financial data, which considers both past years' financial data and future indicators. Overall, the RPG is a critical document that plays a significant role in the budget development process for the defense sector.

Please find below a detailed overview of how The Ministry of Defence practices a three-level defence programs management system, as a result of reforms and policy changes. For each program, the Minister appoints a program manager, coordinator, and budget holder/manager, each with their own distinct responsibilities. Table N2 and N3 provide further details on the responsibilities of the MOD Defence Programs, subprograms, their managers, coordinators, and budget holders/managers.



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This table is an excellent resource for anyone interested in understanding the structure of the MOD programs.

MOD Current Defence Programs Structure

Code	Budget	Defence Programs
	29 00	Ministry of Defence of Georgia
	29 01	Defence Management
	29 02	Professional Military Education
01	29 02	Basic Military Training (Cadets Military Lyceum)
02	29 02	Military Education (National Defence Academy Of Georgia)
03	29 02	Professional Development (Defence Institution Building School)
04	29 02	Specialist Training
05	29 02	Training Courses
	29 03	Social Support and Healthcare
01	29 03	Medicare Development (Military Hospital)
02	29 03	Social Support
03	29 03	Healthcare and Medical Support
04	29 03	Psychological Support and Rehabilitation
	29 04	Command, Control, Communications and Computer Systems
01	29 04	Cyber-security Support (Cyber Security Bureau)
02	29 04	Communications and IT Development
	29 05	Infrastructure Development
	29 06	Scientific Research & Military Industry Development (STC Delta)
	29 07	Capabilities Development
	29 08	Logistics Support

Table N2 - Programs and subprograms.

3.Main Challenges and opportunities of DRMS in the long term planning process



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As The Defense Resource Management System (DRMS) implementation was a complex and demanding reform, requiring the consent of the head of the structure and all the structural units participating in the defense system. This reform was critical for switching to the program budget principle, which demanded argumentative justification from all the direct executors and unit heads. However, the biggest challenge was the lack of acceptance of new things that would change the daily routine due to a shortage of relevant knowledge.

Numerous workshops and training sessions were conducted to address the issue of the defence resource management model and its importance for medium and long-term planning. The process started in 2011, and after overcoming many hurdles, the first program budget was drafted in 2016, which was adapted to the reality of the defence system. Although it was far from the basics of the program budget, the introduction of a new term, "resource," was a notable development. Our strategic partners, the US Office of Defence Cooperation (ODC), and NATO played an essential role in providing a range of relevant experts and education platforms in this process. Simultaneously, within the organization, we continued to push reforms until the concept was well understood, and we involved a wide range of personnel in educational activities.

All these efforts led to the establishment of the budget programs, which was a significant milestone toward implementing the Defence Resource Management System (DRMS) in 2018. These programs are shown in Table N3. The 2019 budget consisted of ten programs, which were on par with those shown in Table N2.

The Georgia Defence and Deterrence Enhancement Initiative (GDDEI) has designated two lines of effort for DRMS institutional enhancement. The first line of effort is Resource Management Development, which aims to establish a modern resource management system by September 30th, 2027. This system will be driven by clear and detailed policies and priorities that will guide program-based budgeting processes and procedures, inclusive of all requirements, in order to reduce risk and increase readiness.

The second line of effort is Strategic Defence Acquisition, which will conduct a comprehensive review of the current Defence Acquisition system of the GDF and develop a new Defence Acquisition concept by 2025. The two LOEs will work together to develop and enhance DRMS at the MoD level as well as to define the responsibilities between civilian and military structures. This will include reviewing legal procedures and implementing structural changes for better synergy effects.

4. Conclusions

In conclusion, effective Defence Resource Management (DRM) is vital for the success of any military or defence organization. It ensures that resources are allocated efficiently and effectively to achieve operational objectives, maximize impact on national security, and minimize waste. Throughout the history of DRM, exemplified by figures like Robert S. McNamara, innovative approaches like the Program Planning Budgeting System (PPBS) have been introduced to modernize defence planning and management practices.

Within the Georgian Ministry of Defence (MOD), DRM has undergone significant developments and reforms over the years. Initiatives such as program-based budgeting, collaboration with international partners, and the implementation of the Financial Management and Control System (FMC) have contributed to enhancing resource management practices. The establishment of a three-level management system for defence programs and the adoption of comprehensive resource policy guides further demonstrate the MOD's commitment to efficient and transparent resource management.



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However, challenges persist, including the need for greater acceptance of new practices and the continuous refinement of DRM processes. Training and educational initiatives have played a crucial role in overcoming these challenges, but ongoing efforts are required to ensure widespread understanding and adoption of modern resource management principles.

Looking ahead, the Georgia Defence and Deterrence Enhancement Initiative (GDDEI) outlines ambitious goals for further enhancing DRM. By establishing a modern resource management system and conducting a comprehensive review of defence acquisition processes, the MOD aims to reduce risks, increase readiness, and strengthen synergy between civilian and military structures.

In summary, DRM remains a cornerstone of effective defence planning and management, both in Georgia and globally. By prioritizing efficient resource allocation, fostering collaboration, and embracing innovative approaches, military and defence organizations can better equip themselves to address evolving security challenges and safeguard national interests.

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**THE TUNISIAN E-PROCUREMENT SYSTEM:
CHALLENGES AND PROSPECTS**

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Abstract:

As part of rebuilding people's trust in the government after the 2011 revolution, Tunisia's public procurement framework underwent reforms that included the introduction of a comprehensive e-procurement platform called TUNEPS (Tunisian e-Procurement system), which replaced the paper based centralized procurement system. Creating a fully functional digital procurement system promoted transparency through public online posting of bids and procurement procedures. TUNEPS has improved access to public procurement by financially vulnerable groups, including small and medium enterprises (SMEs) and women-owned enterprises.

The 2011 Tunisian revolution brought a series of reforms that aimed to rebuild people's trust in the government, including introducing an e-procurement system for public institution's construction, restoration, cleaning, catering, and equipment services. With the old centralized paper-based public procurement system, businesses outside of the capital were more prone to exclusion, as they were not adequately informed of bids and would need to travel several times to Tunis (Tunisia's capital city) to submit their offers for public bids. In addition, there was a greater risk of corruption due to lesser transparency.

The Tunisian e-procurement system is modelled after the Korean e-procurement system KONEPS, and was built in collaboration with the Korean International Cooperation Agency (KOICA). It is operated by the Tunisian Public Procurement Authority (HAICOP). To participate in public e-procurement, buyers and suppliers must first register with TUNEPS and then obtain an electronic certificate that can be used for e-signatures from the National Agency for Electronic Certification (ANCE). The e-signature is essential to sign contracts.

Key words: procurement; system; electronic; reform; business

1. Introduction

Public procurement is an important issue for public policy in all countries. They are the vector through which public investment for development is implemented. They therefore account for a significant proportion of public spending by states.

In this context, Tunisia has embarked on the process of reviewing the mechanisms that govern its public action, including in particular the self-assessment of the national public procurement system. For this reason, an evaluation of the public procurement system was launched in March 2012. This action focused on the following four axes: the legal and regulatory framework, the institutional framework and management capacity, procurement activities and market practices, and the integrity and transparency of the public procurement system.

The study of the legal framework for public procurement in Tunisia on the one hand and its comparison with the Organization for Economic Cooperation and Development (OECD) principles for strengthening integrity in public procurement on the other showed that it suffered from fragmentation, lack of consistency, insufficient transparency and poor organization of control mechanisms. This assessment led to a new legal framework for public procurement to address the shortcomings of the system. Decree No. 2014-1039, the new text regulating public procurement that



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entered into force in June 2014, has indeed provided the expected response in terms of consolidation, simplification of procedures, accountability of contracting authorities, transparency and integrity.

The creation of a platform for the dematerialization of public procurement, the "Tunisian E-Procurement System" (TUNEPS), has indeed launched a major revolution in the field of public markets.

However, despite the steps taken, the public online purchasing system (TUNEPS) today faces some challenges stemming from the internal and especially the external environment. It also seems very important to think about the future of the system and its prospects in order for this project to be successful.

The dematerialization of public procurement in Tunisia through the implementation of the “TUNEPS” platform is a project that combines two national priorities: the development of an electronic administration and ensuring compliance with the principles of public procurement in terms of equality, transparency and integrity of procedures, as well as the fight against corruption. However, this experience is encountering difficulties and showing limitations that still need to be overcome.

In order to develop our main idea, it is first necessary to present the inventory of the electronic public procurement system in Tunisia (TUNEPS). Then, it is appropriate to analyze the challenges and difficulties that this system entails, and finally, we will try to provide an analysis of the perspectives of this system.

2.Establishment of TUNEPS in TUNISIA

The regulation of public procurement has undergone significant changes over the last two centuries and has been the subject of sporadic texts dating back to the decree of July 25, 1888, which regulated the formalities for awarding public contracts.

Finally, Decree No. 2014-1039 of 13 March 2014 has changed and revolutionized the legal framework for the regulation of public procurement in Tunisia, in particular through Articles 77, 78, 79, 80, 81, 82 and 148 of the aforementioned decree, which contain specific provisions for online public procurement. These articles establish the public online purchasing system TUNEPS (Tunisian e-procurement system). Transactions carried out through this system thus have probative value and ensure the recording of all transactions carried out by registered users. The system also guarantees the confidentiality and security of transactions on a computer network that is accessible without discrimination. It is also subject to the legal and regulatory provisions governing the security of electronic transactions. The system enables the electronic signature of documents, which authenticates the holder in accordance with the provisions of current legislation on electronic signatures, and in accordance with the decree of July 31, 2018, TUNEPS will be mandatory for the award of public contracts for all contracting authorities from September 2019.

Objectives:

The "Tunisian e-Procurement System" (TUNEPS) is a Tunisian-South Korean cooperation project that was officially inaugurated in January 2013. A system which guarantees the confidentiality and security of transactions in a transparently accessible network makes it possible to control the possibility of choosing the direct market by the public organization.



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This initiative, which is part of the development of working methods and the modernization of the administration, aims to guarantee and strengthen transparency in the field of public procurement and to combat corruption in this sector.

And in general, it can be said that TUNEPS pursues the following objectives:

- Strengthening respect for the principles of public procurement,
- Shortening the deadlines for purchasing and public procurement,
- Improving the efficiency of public procurement,
- Transparency,
- Economic efficiency of public spending,
- Increasing opportunities for SMEs,
- Strengthening competition,

This system will indeed make it possible to accelerate the pace of preparation of administrative and financial market acts and to implement public projects within the planned deadlines, as well as to improve the efficiency of public markets and strengthen competitiveness. It is also about establishing the principle of equal opportunities for suppliers, shortening the time for concluding public contracts and also reducing project costs.

The operating principle of the online public procurement system is based on specific components and predefined procedures which make it possible to manage and conclude contracts under the best possible conditions.

Features of the TUNEPS system

Dematerialization is merely a tool for the exchange and processing of documents by electronic means. It therefore does not entail any change to public procurement procedures, which remain the same if they are carried out on paper. The steps of a dematerialized procedure are the same as for a paper-based procedure.

In fact, there are 4 subsystems within TUNEPS:

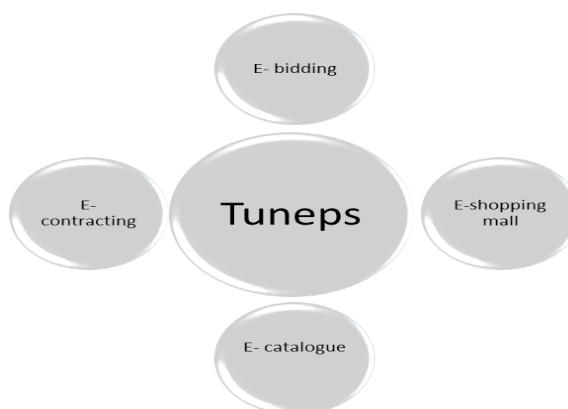


Fig.1 TUNEPS subsystem

E-bidding

The electronic procurement of public contracts (e-bidding) consists in the use of electronic means of communication and the processing of transactions carried out by the administration with the private sector in order to manage the various tendering procedures

This component makes it possible to automatically manage



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- ➤ Publication of tender notices,
- ➤ Submission and receipt of tenders online,
- ➤ Opening of online tenders,
- ➤ evaluating and publishing the results of online tenders.

E-contracting

This is the component relating to the conclusion of online contracts for public contracts. The latter has probative value, it enables:

- ➤ drafting, notifying and signing contracts
- ➤ Drafting and signing addenda
- ➤ Inserting, sending and receiving service orders
- ➤ Evaluation and statistical monitoring

E-catalog

This is an electronic catalog that manages products classified according to the United Nations Standard Products and Service Code (UNSPSC), an international standard classification. It provides information for other systems for electronic tendering, electronic contracts and electronic purchasing centers. It therefore enables:

- Product registration
- Technical characteristics
- Insertion of the product nomenclature.

E-shopping-mall

It is an online market that allows public buyers to place all over-the-counter orders for the purchase of products and services on the basis of unit price commitments already concluded with suppliers. It enables:

- ❖ **For public buyers:**
 - Search for goods and prices
 - Orders and order tracking
- ❖ **For suppliers:**
 - Price quotations
 - Receipt and execution of orders.

3. The challenges of the TUNEPS

The establishment of the TUNEPS system aims to modernize the administration to meet international standards in public procurement. The TUNEPS platform, as it is designed, makes it possible to achieve this goal. However, despite the efforts made, it has some limitations. Some limitations are related to the system itself, others to its external environment.

Challenges arising from the internal environment

Problem of data exchange

The speed at which documents are sent or downloaded does not exceed 20 megabytes (which is the lowest speed that can be used at national level). This significantly affects the speed and quality of transactions carried out via the system, especially as the session available to each user is limited to 4 hours. As a result, both contracting authorities and economic operators registered on the platform have difficulties downloading tender documents. Indeed, a session to open a call for tenders



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can last two or three days, while a similar session in the context of substantive procedures lasts on average no more than half a day.

To overcome these problems, the Public Online Business Unit has taken exceptional measures. The Unit has prepared a standard file in Excel format that can be used by users. This file is secure (it cannot be modified by the recipient). It is available from today on the TUNEPS platform website, can be downloaded by suppliers and filled in offline by those wishing to take part in the tender, and will then be downloaded once the financial offers have been drawn up. Once sent, it is encrypted and can no longer be modified.

A system for the dematerialization of but with documents that can be sent offline

The implementation of the TUNEPS system aims to ensure the complete dematerialization of public procurement, i.e. to make all purchasing documents and procedures immaterially public. However, as the system has not integrated banking networks, bank guarantees of all kinds are now submitted offline. Indeed, the bank guarantees must be submitted in sealed envelopes before the deadline for the submission of tenders. The TUNEPS system systematically generates the opening report and the public buyer is now obliged to produce another opening report for provisional bonds.

On the other hand, large documents cannot be sent quickly due to the limited capacity of the system. Therefore, bidders must send these documents in sealed envelopes as a supplement to the bids submitted online. These documents must be the subject of a separate opening report.

In short, the TUNEPS platform today is not able to process all the documents required for bid submission, as multiple documents cannot be sent online.

Question related to product classification

Since 2014, the date of the launch of TUNEPS, only 301 products have been registered by suppliers in the e-catalogue of this system.

The reason for this is the complexity of this step, which is based on a coding system called UNSPSC (United Nations Standard Product and Services Code). This is an eight-digit coding system developed for the classification of products and services in e-commerce systems. The classification makes it possible to create a nomenclature of more than twenty thousand categories with a four-level hierarchical structure: “segment”, “family”, “class” and “product”.

In addition to these limitations stemming from the platform itself, there are other challenges stemming from the external environment that affect the proper functioning of the system.

Challenges originating from the external environment

The history of the establishment of the TUNEPS system in Tunisia has been accompanied by a commitment from all stakeholders to ensure the success of the project. However, it should be noted that neither the banks nor the public structures linked to the control process or the payment process are actually working on the platform.

Problem of Availability

TUNEPS is a platform that can only be operated via the Internet and the services require a connection to the global network. For this reason, the quality of operation and the speed of data depend heavily on the coverage provided by the Internet network at a national level. This stability is significantly impaired in regions that are less covered by internet networks. Due to the lack of an efficient network, it is also severely affected during peak hours, everywhere in Tunisia. Thus,



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opening tenders or publishing certain information related to a tender becomes a tedious task for users, especially in the interior regions or during rush hours.

The use of the system varies between simple consultation by the public and actual use by contracting authorities or economic operators for the management of tenders at different stages. Today, thousands of users are registered on the platform and hundreds of thousands of visits are recorded on the website every day. The platform is currently under a lot of pressure due to the large number of users and visits. This slows down the response time and affects the profitability of the system.

Problems related to economic operators

Although participation in the public online order has been mandatory for all economic operators since 2018, it is noticeable that the number of economic operators registered in the system is developing slowly, contrary to all expectations. In fact, several economic operators are not yet registered on the platform. This is due to the reluctance of economic operators, particularly in the regions.

This reluctance has led to low participation in public procurement in these regions, which has a direct impact on the efficiency of public procurement.

Most of the economic operators registered in the system are usually large companies that can provide the human and material resources required to participate in public tenders. A considerable number of micro, small and medium-sized enterprises are outside the system. Craftsmen and food producers are a typical example of these companies.

Problems related to public buyers

External problems with the system are not limited to economic operators. In fact, public buyers are also affected by these errors. Several public buyers are not yet registered in the system, either because the infrastructure in their own country is inadequate or because they do not receive electronic certificates from the National Agency for Electronic Certification, which is very popular for requests.

The lack of training and supervision of public officials is also a major obstacle to the smooth functioning of the system. Despite the efforts of the Public Online Procurement Department to provide as much training as possible, several public servants involved in the public procurement process have not had the opportunity to participate in the training required to use the platform.

Like any new experience and after a certain period of operation of this system, the TUNEPS platform has reached its limits in terms of the objectives sought by the executive. In this context, corrective measures must be taken to revitalise this system

4. Prospects for the TUNEPS

Despite the difficulties and challenges already mentioned and for a better recovery for this system that has been designed. It seems very useful to carry out a profound reflection on the future prospects of this project, whether at the national level or within the Ministry of National Defense.

Certainly, the adoption of an electronic public procurement system is a revolution in the field of public management; it allows the digitalization of procedures, the strengthening of governance, and the economy of expenses.

The benefits of this system have crossed the borders of the country, and it is recognized today by international organizations as a very important tool for public procurement governance because it



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ensures transparency, contributes to reducing corruption, and allows Tunisia to move from physical space to intangible space.

However, given the challenges and limitations already mentioned in this system, it is necessary to implement an action plan to remedy these imperfections.

Thus, the integration of the e-payment component, the facilitation of registration and the integration of control bodies, the development of the environment e-catalogue, the establishment of a cloud, and the improvement of capacity are the future steps to be taken to guarantee the desired performance for this system.

A purchasing system must have a fundamental component for online payment. It is far from a luxury; it is necessary to guarantee the success of public purchases. An order-managed online must certainly be paid; otherwise, the system remains incomplete or unable to complete the public purchasing process.

Through this element, the platform can complete the public purchasing process (planning, competitive bidding, opening offers, approval of the competent procurement committee, and award of the order, execution, payment, and final settlement).

This project is currently the subject of a critical debate between various stakeholders, such as the online public purchasing unit, the national agency of certification electronics, and well obviously the central Bank of Tunisia, and other different banks. The E-PAYMENT project aims to make it possible to pay online bills. A major project is open today among various stakeholders to facilitate the settlement of the accounts of economic operators holding public order.

Electronic payment will certainly simplify public order procedures not only for public buyers but also for economic operators, because it allows payment deadlines to be shortened. This positively influences the quality of services and effectiveness of public purchases.

Having an electronic payment system is the first step in the digital path. A certificate is the equivalent of an identifier, digital identity, and electronic signature. Each economic operator must have a certificate. This allows one to place oneself on the system. Without a certificate, we would have been outside the system.

Since the launch of the operating phase of the system, everyone has complained about the cumbersome procedures for obtaining this electronic certificate. The formalities are new for most beneficiary residents in Tunisia, almost incapacitating for non-residents. Let us assume that a foreign company wants to obtain an electronic certificate. In addition to the payment of 81 dinars, the procedures require the travel of the first manager of the company to the headquarters of the national electronic certification agency. This approach seems incompatible with the spirit of the dematerialization of procedures. Therefore, we must consider this approach. Certificates must be granted online. A password and login are solutions that can solve this problem.

The E-catalogue subsystem constitutes an advertising environment designed to understand all the products available for sale. Economic operators can, thanks to this subsystem, register their products by visualizing the technical characteristics of each product. For his part, the public buyer can thus know, with a simple click, not only the varieties of products available on the market but also get an idea of technological developments in different sectors. The idea is great, but such an approach can only have its fruits and advantages if all products available on the market are registered. However, we notice today, after 6 years of its launch, that the platform includes very few products, six years after its launch. The E-catalogue does not attract sufficient attention from economic operators. Only 301 products are registered on the platform. A limited number of participants is required to achieve the desired objective. This can be explained by the difficulty of classifying products that must respect a coding system known as United Nations Standard Product and Services Code (UNSPSC). Although it is recognized internationally as a reference for



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classifying supplies, very little is known about it in Tunisia. This makes product registration difficult, and the implementation of this subsystem is more difficult.

To overcome these difficulties, the online public purchasing unit launched a series of training actions for various economic operators concerned with familiarizing them with this system coding. However, despite this effort, the problem persists because a public body is needed that must take care of the classification of products. Who will do it? The Ministry of Industry and the National Institute of Standardization and Industrial Property (INIOSIP)? This decision has not yet been made.

Thus, the classification of products according to the universal coding system constitutes a challenge to be met in developing an E-catalogue. A project that requires bringing together the efforts of all the structures concerned, including public administration, economic operators, and professional organizations such as UTICA.

The coding system must be simplified for economic operators to register products. This objective can be achieved through a series of trainings and online technical assistance available to beneficiaries.

Managing public purchasing procedures, whether in a physical or intangible environment, means, in the simplest conception, the application of a series of procedures; it is an ongoing process. Finally, the output was a set of documents. Carrying out this process is, above all, the management of documents and exploitation of the results. This involves applying rules governing the same operations each time, and retracing the same mechanisms. Traceability is fundamental for control, monitoring, and evaluation.

Keeping this volume of documents, which continues to increase over time, certainly requires reserving storage space to save different documents for each purchase. Otherwise, the history is lost.

Designers of the TUNEPS platform have provided a central server for storing documents. Each document issued or received through the platform is automatically saved so that these documents can be consulted at any time later. However, this server is capable of storing an unlimited number of documents. The answer from specialists is negative. Each storage space has a specific capacity. However, overtaking was not possible.

That's the problem. Medium storage has limited capacity, which, once reached, may no longer save documents. For this reason, the implementation of a cloud becomes a technical necessity to guarantee not only the backup of documents but also, above all, enable traceability within the system.

Is the TUNEPS platform capable of carrying out public purchasing procedures with a throughput of 20 Megabytes? Is it capable of managing the transactions of thousands of public structures and economic operators that are currently registered on the platform with a duration of operation that does not exceed four hours at each time for each user? Would it be able to assimilate the number of registrants that will continue to increase with the birth of a new society?

These questions find answers in the strategic vision of the high authority of public procurement (HAICOP), which felt the importance of improving the capacity of the platform. Adequate response time, data speed, and continuity of system availability are the objectives set by the online public purchasing unit to improve the quality of data exchange on the platform. The work is daily for the managers of this unit to minimize the time for opening assignments, opening offers, and downloading documents. Moreover, the authors recognized this defect. However, they explain this weakness by exogenous factors due to low Internet speed nationally.

The solution consists of improving this throughput, which will certainly allow a radical change in the quality of transmission and use of data on the platform.

Prospects at the level of the Ministry of National Defense



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The Ministry of National Defense has not been isolated from its environment. It is aware that in a digitalized world, resistance is useless. For this reason, and despite the specificities of its purchases and its structure and the particularity of its activity, it did not make an exception compared to public online purchasing. Indeed, the military institution, concerned with improving the efficiency of its purchases, finds itself, like most other public structures, at the heart of the digital transformation launched in Tunisia for several years as part of the project "Digital Tunisia 2020."

Most of the structures under the Ministry are registered and make purchases online. However, it should be noted that despite the efforts made to integrate all the military structures concerned, several organizations are now outside the system. Their faults or the faults of an online public purchasing unit it does not matter who is responsible for this delay. The fact is there. In fact, some departments have not yet received electronic certificates. They manage their calls for tenders, exceptionally using certificates from other organizations. The case of the Directorate of Heritage, Media, and Culture (DHMC), which uses the electronic certificate of the General Directorate of Clothing and Subsistence (GDCS), remains the most striking example of this delay.

Like all public administrations, the Ministry of National Defense adopts an online public procurement system for the objectives already mentioned in the first part, but there are still bodies and organizations that have not yet been registered.

From this observation, it is imperative that efforts be made to remedy these inadequacies; the delay cannot be tolerated, especially with the commitment of the military to the digital path. Indeed, several other projects have been launched, namely ELLISSA and GED, and a national system for monitoring public projects INJEZ has been established. It is in this spirit that various military organizations must integrate as quickly as possible into this wave of digitalization. Sufficient funding and staff training are factors in this transformation.

5. Conclusions

The digitalization of public purchasing presents itself as one of the pillars of economic development. Therefore, Tunisia launched an online public procurement project (TUNEPS). Concerns regarding transparency, governance, and the optimization of procedures were factors that gave rise to this system. It is obvious that the project has enabled the transformation of public purchasing to digital purchasing. Public administration and economic operators find themselves today faced with a digital reality that has allowed the simplification of procedures and saving time, which has positively influenced the climate of business.

However, despite these efforts, this system has several failures. Two types of problems were identified. On the one hand, these are problems that emanate from the platform itself, namely, the availability problems, the problems of exchange of the flows, and the inability of the system to immaterialize all the procedures. On the other hand, the challenges are imposed by the external environment, namely connection problems, problems arising from public buyers and economic operators, and problems related to control bodies.

Despite these failures that do not significantly affect the operation of the platform, a range of solutions can be adopted to compensate for the inadequacies of the system. The establishment of an online payment system, facilitation of registration, simplification of the management of the E-catalogue environment, and implementation in place of a sufficient cloud to save the history of all operations will be the emergency measures to be undertaken to guarantee better performance of this system. Additionally, regular training sessions and technical support for users could enhance their ability to navigate and utilize the platform effectively, further mitigating some of the external challenges.



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Is there still a need to review how access rights are managed to involve control authorities for better governance of public procurement? Absolutely, revisiting the access rights framework to ensure that control authorities are adequately involved could enhance oversight and governance, ensuring that procurement activities are conducted with the highest standards of integrity and accountability. Implementing advanced encryption methods and robust audit trails can also ensure data integrity and security, thus gaining the trust of all stakeholders involved.

Certainly, the Ministry of National Defense does not miss the digital waves. It is at the heart of digital transformation through a firm commitment to optimize these purchases. However, would this transformation be capable of assimilating all types of purchases by military institutions, which requires respect for the secret nature of these purchases? Given the sensitive nature of military procurement, special considerations must be made. The system would need to incorporate stringent security measures, such as advanced encryption, secure authentication protocols, and isolated data environments to handle classified information safely.

Moreover, the integration of secure block chain technology could provide an immutable record of transactions, further enhancing security and transparency. Collaborations with cybersecurity experts and continuous monitoring for potential vulnerabilities will be essential to protect against threats. By addressing these unique requirements, the digital transformation of military procurement can be achieved without compromising the confidentiality and security of sensitive operations.

In conclusion, while TUNEPS marks a significant advancement in the digitalization of public procurement in Tunisia, continuous improvements and tailored solutions are necessary to fully realize its potential and extend its benefits across all sectors, including the highly sensitive area of military procurement.

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**A POTENTIAL NATO WITHOUT USA – IMPLICATIONS,
CHALLENGES AND OPPORTUNITIES**

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Abstract:

The North Atlantic Treaty Organization (NATO) has been viewed as a key component of global security, enabling member states to defend themselves collectively. The hypothetical scenario of NATO without the United States is a significant challenge, carries profound implications, and also offers certain opportunities. This essay will explore the multifaceted dimensions of such a scenario, analyzing the challenges NATO would face, the implications for its member states and global security, as well as the potential opportunities for adaptation and evolution for the other member states.

Key words: geopolitics; NATO; scenarios; challenges; opportunities

1. Introduction

The North Atlantic Treaty Organization (NATO) has been viewed as a key component of global security, enabling member states to defend themselves collectively. The hypothetical scenario of NATO without the United States is a significant challenge, carries profound implications, and also offers certain opportunities. This essay will explore the multifaceted dimensions of such a scenario, analyzing the challenges NATO would face, the implications for its member states and global security, as well as the potential opportunities for adaptation and evolution for the other member states.

[11] The Geopolitical shifts and security concerns

The United States' withdrawal from NATO would create a significant strategic void in the alliance's defence capabilities.

The U.S. military provides NATO with advanced weaponry, intelligence assets, and logistical support, which are critical for maintaining deterrence against potential adversaries. Without these capabilities, NATO's ability to project power and defend its member states would be severely compromised. This would create a strategic imbalance in favour of potential adversaries, such as Russia, who may perceive NATO as weaker and more vulnerable to coercion or aggression.

NATO's strength lies in its collective defence posture and the credibility of its deterrent capabilities. The absence of the United States, NATO's primary military power, would significantly weaken the alliance's deterrence posture. Potential adversaries could exploit this perceived weakness to challenge NATO's resolve and test its defence capabilities. This could lead to increased military tensions and potential conflicts in strategically important regions.

Furthermore, from a strategic standpoint, a weakened NATO could have broader implications for global stability. NATO's operations and partnerships extend beyond the Euro-Atlantic region,



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playing a crucial role in maintaining global security and stability. The loss of U.S. military capabilities could undermine NATO's ability to address security challenges in regions such as the Middle East, North Africa, and the Asia-Pacific. This could lead to increased volatility, regional conflicts, and power vacuums that could be exploited by hostile actors or terrorist organizations.

The withdrawal of the United States from NATO would strain transatlantic relations and undermine strategic partnerships. NATO has long been the cornerstone of the transatlantic alliance, symbolizing the shared values and interests between North America and Europe. The loss of U.S. leadership could lead to mistrust and resentment among European allies, who may feel abandoned or betrayed by their closest strategic partner. This could hinder cooperation on critical security issues and weaken NATO's ability to respond effectively to emerging threats.

Nevertheless, this perception could undermine confidence in U.S. commitments to uphold global security and stability. It might also embolden adversaries, who may see an opportunity to expand their influence or challenge international norms without fear of U.S. intervention. This could lead to increased strategic competition and instability in regions of strategic importance to the United States.

The financial burden of maintaining NATO's collective defence capabilities could strain national budgets and hinder strategic investments in critical defence capabilities. European NATO members, in particular, may struggle to increase defence spending to compensate for the loss of U.S. contributions (see annex 1). This could lead to a decline in military readiness and capabilities, reducing NATO's ability to deter potential adversaries and respond to emerging security challenges.

The strategic implications of reduced defence spending could extend beyond NATO member states. A decline in military capabilities among NATO allies could weaken the alliance's overall deterrence posture, making it more vulnerable to external threats. This could embolden adversaries and increase the likelihood of military conflicts or crises in strategically important regions, including even NATO member's territory.

A potential NATO without USA could also have broader economic ramifications. NATO member states are major contributors to the global economy, and any disruptions to their security or stability could have ripple effects worldwide. A decline in transatlantic trade, investment, and economic cooperation could weaken global economic growth and stability. This could undermine efforts to address pressing global challenges, such as poverty, inequality, and climate change, which require coordinated international action and cooperation.

The United States' withdrawal from NATO could undermine the multilateral institutions and norms that underpin the rules-based international order. NATO has played a crucial role in promoting stability, democracy, and cooperation among its member states. The loss of U.S. strategic direction could weaken NATO's ability to uphold these values and principles, leading to increased strategic competition and conflict. This could undermine efforts to address pressing global challenges, such as terrorism, nuclear proliferation, and pandemics, which require immediate and collective action.

A weakened NATO could lead to increased fragmentation and polarization within the international community. Without U.S. conducting role, countries may pursue divergent security strategies and alliances, leading again to internal competition between NATO remaining members.



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This could create strategic vacuums that could be exploited by hostile actors or revisionist powers, leading to increased tensions and conflicts in different regions all over the world. A more fragmented international system could undermine global stability and security, with potential implications for U.S. interests and security itself.

Such an unexpected withdraw could also affect global governance mechanisms and institutions because NATO has played a crucial role in shaping international norms and institutions, such as the United Nations, and promoting democratic values and human rights.

The United States' withdrawal from NATO could lead to a decline in U.S. influence and credibility on the world stage. NATO has been a force multiplier for U.S. foreign policy objectives, enabling the United States to project power and promote its strategic interests globally. Without NATO, the United States may struggle to maintain its leadership role and rally international support for its initiatives. This could weaken America's influence and credibility, reducing its ability to shape global events and advance its strategic interests.

The unwanted, but inevitable road to a policy of isolationism could have far-reaching consequences for U.S. interests and security. A U.S. withdrawal from NATO could lead to a more isolationist foreign policy stance, with the United States focusing inward and prioritizing domestic concerns over international engagement. This could lead to a reduction in America's global footprint and a retreat from its traditional role as a global leader and guarantor of security and stability. From a strategic perspective, increased isolationism could undermine America's ability to address pressing global challenges and protect its interests abroad.

The absence of NATO's collective defence guarantees could expose the United States to increased security threats. Without the deterrence provided by NATO, potential adversaries might perceive America as more vulnerable and emboldened to challenge its interests. From this point of view, a more unstable and insecure international environment could undermine America's security and stability, with potential implications for U.S. interests and strategic objectives.

The security of many European NATO members heavily relies on the U.S. security umbrella, which provides deterrence against potential adversaries and reassurance in times of crisis. A U.S. withdrawal would necessitate a fundamental reassessment of European security strategies, as these countries would no longer be able to rely on U.S. military capabilities and commitments. European nations would need to take on more responsibility for their own defence, including developing the necessary military capabilities and infrastructure to ensure their security independently.

European NATO members would need to rebalance their defence priorities to focus on deterring potential threats from actors like Russia and addressing emerging security challenges such as cyber warfare, hybrid threats, and terrorism. This may require reallocating defence budgets, restructuring armed forces, and investing in advanced military technologies.

With the absence of U.S. military support, European nations would need to develop robust crisis management capabilities to respond effectively to security crises within the region. This includes strengthening rapid response forces, improving interoperability among national militaries, and enhancing intelligence-sharing mechanisms to address security threats in a timely and coordinated manner.



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While European NATO members have made progress in defence integration through initiatives like the European Union's Permanent Structured Cooperation (PESCO) and the European Defence Fund (EDF), significant challenges remain. A U.S. withdrawal could disrupt ongoing efforts to strengthen European defence cooperation and deepen integration, posing obstacles to achieving true defence autonomy.

Achieving greater defence integration requires overcoming political and institutional hurdles, as each European nation has its own defence policies, procurement processes, and national interests. European governments would need to navigate complex bureaucratic structures and negotiate.

European militaries are heavily reliant on U.S. defence technologies, equipment, and systems. A U.S. withdrawal could disrupt supply chains and create technological dependencies, making it challenging for European nations to maintain their defence capabilities. European defence industries would need to accelerate efforts to develop indigenous technologies and reduce reliance on U.S. imports.

The United States plays a central role in NATO's efforts to combat terrorism, providing crucial intelligence, military assets, and expertise. A U.S. withdrawal would significantly weaken NATO's counterterrorism capabilities, leaving member states more vulnerable to terrorist threats.

Furthermore, United States is a key contributor to NATO's intelligence-sharing mechanisms, providing valuable information on terrorist networks, activities, and threats. Without U.S. intelligence support, NATO may struggle to collect, analyze, and disseminate actionable intelligence to member states, hindering their ability to detect and disrupt terrorist plots.

Very close linked, it has to be mentioned that U.S. military possesses advanced capabilities for conducting counterterrorism operations, including special operations forces, unmanned aerial vehicles (UAVs), and precision-guided munitions. These assets are often deployed in support of NATO's counterterrorism missions, such as Operation Resolute Support in Afghanistan. A U.S. withdrawal would deprive NATO of these critical military capabilities, reducing its ability to conduct targeted strikes against terrorist targets and support partner forces on the ground.

The United States provides training, mentoring, and capacity-building assistance to NATO partners and allies in regions affected by terrorism, such as the Middle East and North Africa. U.S. military personnel also offer expertise in areas such as counterinsurgency, counter-IED (improvised explosive device) operations, and counter-radicalization efforts. Without U.S. support, NATO may struggle to train and equip partner forces effectively, undermining their ability to combat terrorism locally and regionally.

Hybrid threats, which combine conventional military tactics with non-military means such as cyber attacks, disinformation campaigns, and proxy warfare, pose significant challenges to NATO's security. The United States is a leader in cyber security capabilities and plays a central role in protecting NATO's networks and critical infrastructure from cyber attacks. This is the reason why NATO will be much more vulnerable in front of cyber defences threats, and the risk of cyber attacks targeting NATO member states, government institutions, and critical infrastructure will be almost impossible to be addressed at list on short and medium term.

Nevertheless, Russia has been increasingly using disinformation campaigns and influence operations to undermine NATO cohesion, sow discord among member states, and weaken public



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trust in democratic institutions. The United States has expertise in countering disinformation and conducts strategic communications campaigns to counter Russian propaganda. Without U.S. support, NATO may struggle to effectively respond to disinformation and influence operations, leaving member states more susceptible to manipulation and destabilization.

NATO's ability to adapt to evolving security threats is essential for maintaining its relevance and effectiveness. A U.S. withdrawal could undermine NATO's credibility and diminish its capacity to address 21st-century security challenges. In this regard, the Alliance must adapt its strategies, structures, and capabilities to address emerging security threats, including terrorism and hybrid warfare.

NATO's capacity to protect member states from security threats directly affects its relevance to member states. If NATO is perceived as unable to address emerging security challenges effectively, member states may question the value of the alliance and seek alternative security arrangements. The global security environment is evolving rapidly, with new threats and challenges emerging in regions around the world. NATO must remain agile and adaptable to address these challenges, but a U.S. withdrawal could hamper NATO's ability to respond effectively to evolving security dynamics.

In contemplating a NATO without the United States, one of the most compelling prospects lies in the potential for increased unity among European nations. This essay delves into the various dimensions of how such a scenario could foster a stronger sense of cohesion and collaboration within Europe.

At the heart of this opportunity is the empowerment of European nations within NATO. Historically, the US has held a dominant position in the alliance, often steering its direction and decision-making. However, with the US no longer the central figure, European countries would find themselves with greater agency in shaping NATO's policies and priorities. This shift in power dynamics would undoubtedly lead to a newfound sense of ownership over European security affair.

With this empowerment comes a natural inclination towards strengthened cohesion among European nations. Without the US overshadowing discussions, European countries would be more inclined to work together in pursuit of common goals. The shared understanding of the importance of collective security would deepen, fostering a sense of solidarity among member states. This cohesion could extend beyond military matters to encompass political, economic, and diplomatic cooperation, creating a more integrated and cohesive Europe.

A key driver of increased European unity within a NATO without the US would be the promotion of greater collaboration and integration. European countries would likely invest more in joint defence projects, recognizing the need to pool resources and capabilities. This could include initiatives such as joint military exercises, defence industry cooperation, and the development of collective defence mechanisms. The result would be a more interoperable and standardized European defence force, capable of addressing a wide range of security challenges effectively.

Without the US as a central figure in NATO, European nations would have the opportunity to prioritize security challenges that are more immediate and pertinent to the continent. The absence of US involvement could lead to a more focused approach on European-specific threats, such as Russian aggression in Eastern Europe, terrorism, and cyber-security vulnerabilities.



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The absence of US involvement in NATO could lead to more targeted and effective responses to European security challenges. European nations would have greater freedom to tailor their defence strategies to address specific threats facing the region

European nations would find themselves compelled to address regional challenges with greater urgency. The ongoing conflict in Ukraine and the annexation of Crimea by Russia have been persistent concerns for European security. With the US out of NATO, European countries would need to take a more proactive role in deterring further Russian aggression and safeguarding the sovereignty of Eastern European nations.

Furthermore, the absence of US influence in NATO could pave the way for greater cooperation between NATO and the European Union (EU) in addressing common security challenges. European nations could leverage the EU's diplomatic and economic tools to complement NATO's military capabilities, leading to a more holistic approach to European security.

With the US no longer part of NATO, European nations would have greater freedom to pursue foreign policies that align more closely with their own interests and values. Historically, US interests and priorities have heavily influenced NATO's decision-making process, sometimes to the detriment of European objectives. However, with the US out of the picture, European countries could assert themselves more assertively on the diplomatic stage.

European nations could develop foreign policies that reflect their unique geopolitical positions and national interests. For example, countries like Germany and France could take a more active role in mediating conflicts in their respective regions, such as the Ukraine crisis or the conflicts in the Middle East. Similarly, smaller European nations could pursue niche diplomatic initiatives that cater to their specific strengths and priorities.

Without the constraints of US influence, European nations could engage with global powers such as China, Russia, and emerging regional actors on their own terms. Historically, European countries have often had to navigate their relationships with these powers within the framework of US-led diplomacy. However, a NATO without the US would provide European nations with the opportunity to redefine these relationships based on their own interests and priorities.

Moreover the economic ties with China may be strengthened, while also addressing concerns about human rights and global trade imbalances. They could also engage with Russia on issues such as energy security and regional stability, without being constrained by US-Russian tensions. Moreover, European nations could play a more active role in regional organizations such as the African Union or the Association of Southeast Asian Nations (ASEAN), fostering greater cooperation and influence beyond their immediate neighborhood.

The absence of the US from NATO could also create new diplomatic opportunities for European nations on the global stage. European countries could lead diplomatic efforts to address pressing global challenges such as climate change, migration, and pandemics. For example, European nations could take the lead in negotiating international climate agreements or coordinating humanitarian responses to global crises.

Moreover, European countries could strengthen their diplomatic ties with traditional US allies, such as Canada, Japan, and Australia, independent of US influence. This could lead to



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increased cooperation on issues of mutual interest, such as security, trade, and development assistance.

2.Conclusions

A NATO without the USA would face significant challenges, including reduced military capability, financial burdens, and the need for new strategic and operational frameworks. However, it would also present opportunities for European strategic autonomy, enhanced cooperation, and a more focused regional security approach. The success of such a transition would depend on the willingness and ability of European NATO members to invest in their defence, adapt to new leadership dynamics, and maintain political cohesion. Ultimately, while a NATO without the USA would be fundamentally different, it could still play a vital role in ensuring European and transatlantic security through innovation, adaptation, and strengthened European cooperation.

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A MOLDOVA'S FRAGILE SECURITY SITUATION

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Abstract:

The Official relations between Moldova and NATO began in 1992 when Moldova joined the North Atlantic Cooperation Council. However, as Moldova's neutrality is enshrined in its constitution, there are no official plans for Moldova to join the organization. Russia's full-scale invasion of Ukraine in February 2022 has upended not only the post-Cold War European security order but also the foundations of the European Union's eastern Neighborhood Policy. The way forward for the EU will build on two significant policy shifts that happened in 2022. First, the decade-old red line of not extending enlargement further east was crossed. As a result, the future EU will be bigger and more Eastern European than before, which for some member states, such as France, is a historical turning point. Second, the separation between enlargement and the Eastern Partnership (EaP) was overcome and the two will now be intertwined. **Fourth**, as Russia's power and dominance in the post-Soviet region continue to diminish in the long run, the EU will need a Wider Eastern Neighborhood Policy that includes Central Asia.

The protracted regional conflicts (in Moldova and the South Caucasus) require a more active EU engagement as existing OSCE formats continue to be blocked, and Russia's role and military presence weaken. New openings for conflict resolution mean higher demand for the EU's diplomatic, monitoring, and peacekeeping capacities.

Moldova's security and future are closely linked with the outcome of Russia's war against Ukraine. This is a decisive year for the country and its government with local elections approaching, in which manipulation by Kremlin proxies is expected, and an economy affected by the energy crisis and rising prices due to the war. In February a new prime minister and government were appointed – a move meant to address security concerns, hybrid threats, and energy dependence on Russia and Transnistria. The government seems prepared to address the threats, yet Moldova strongly depends on EU support. While the presence of Russian troops in Transnistria is often mentioned as the main potential source of destabilization, hybrid threats and the role of Kremlin proxies, such as Ilan Shor's party, are much more of a threat to stability than the Tiraspol authorities.

Key words: Moldova; security; conflict; threats; stability

1. Introduction

Transnistria is relevant here not so much as a military staging post as in its role as a hub used by Russia to spread panic and disinformation. President Vladimir Putin's press secretary, Dmitry Peskov, recently described relations with Moldova as quite tense and, in response to a statement by Recean on the demilitarization of Transnistria, told the government to be “quite careful” as Russia “remains a responsible party” in that region. Russian statements that Ukraine was plotting a false-flag operation in Transnistria have been debunked by the Moldovan and Ukrainian authorities. Russia could also aim to diminish support for Ukraine among the population and to spread the idea that the government wants to drag Moldova into the war.

High Representative for Foreign Affairs and Security Policy Josep Borrell has said that the EU is looking into establishing a Common Security and Defence Policy (CSDP) mission in Moldova in order to “enhance the country's resilience against foreign interference and destabilization efforts.” This would be in addition to the existing EU border mission and other operations in Moldova. It would be a positive development to strengthen the justice, police, and customs sectors, hence improving the security of the country. With Moldova having faced its highest number of cyberattacks in 2022, a CSDP mission should have a strong focus on cybersecurity and hybrid



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threats. The EU could also take a more active role in the negotiations between Chisinau and Tiraspol as this would help maintain stability in the region and prevent any spillover effects from Russia's war against Ukraine.

The Moldova–Ukraine border, the official border between Republic of Moldova and Ukraine, was established after the dissolution of the Soviet Union. The length of the inland border is 1,222 kilometres (759 mi), of which 267 kilometres (166 mi) is fluvial (i.e., along rivers) and 955 kilometres (593 mi) is land border.

President of Moldova Maia Sandu has declared that she condemns the aggression of Russia against Ukraine in the strongest terms. Moldova signed a UN Resolution condemning Russia's aggression against Ukraine. On 3 March 2022, Moldova followed Ukraine and applied for EU membership. During the summer of 2020, the Chişinău International Airport was repeatedly forced to be evacuated after fake bomb threats; some of the threats were traced back to Russia. Hundreds of cyberattacks have been conducted against Moldovan computer systems.

Moldova was almost entirely dependent on Russian energy supplies. In 2022, Russia delivered less than half the amount of natural gas promised in contracts and instituted a 4-fold price hike for gas supplies to the country, leading to a sharp spike in inflation.

2. The final decisive step towards the EU and NATO

On 14 December 2023, the European Council took the historic decision to open accession negotiations with Moldova and Ukraine. The European path of both countries has been closely intertwined since Russia's full-scale invasion of Ukraine on 24 February 2022. Both countries applied for membership in March 2022 and were together granted candidate status in June the same year. Russia's invasion of Ukraine was a direct threat to Moldova. Statements by Russian generals and political leaders confirm that Russia's original military aim was to carve out a land corridor to Moldova by occupying the coast of Ukraine to the Black Sea and link Transnistria to Russia's occupied territories of Donbas and Crimea.

Moldova stands to advance its path towards European integration in 20 October and 03 November 2024 presidential election and referendum, but Moldova will likely remain a battleground state into the 2030s as Moldova's European Union (EU) membership negotiations continue. The possible reelection of pro-Western Moldovan President Maia Sandu and passing of the pro-EU referendum in October 2024 will not set Moldova's EU path in stone, but it would secure a Moldovan executive branch that is committed to furthering Moldova's EU accession process for another four years. The Russian Federation has recently been trying to sabotage Moldova's EU accession and destabilize Moldovan democracy and will continue these efforts in the coming decade. Support for EU membership is growing in Moldova, but the Kremlin is unlikely to cease its influence operations and may instead increase its efforts to reverse pro-EU trends in the coming decade. Moldova's presidential election is of central importance to the Russian Federation's grand strategic effort to maintain its influence over former Soviet states. The reelection of Sandu in 2024 Russia is likely prepared to pursue several lines of effort in the future to derail Moldova's EU path, such as attempting to influence and capture Moldovan state institutions, economic, and political ties to the pro-Russian Moldovan regions of Transnistria and Gagauzia and conducting reflexive control campaigns to shape EU member states' decision-making regarding Moldova's EU accession. The threat of a Russian invasion of Moldova through Ukraine is currently extremely low, but the current conditions may change in the future, allowing Russia to invade and occupy more of Moldova than what it currently does in Transnistria. Moldova's future as an independent and sovereign state is directly tied to the outcome of Russia's war in Ukraine and affects NATO's planning for the defense



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of its eastern flank. Western aid to both Ukraine and Moldova is vital to these states abilities to resist Russian malign influence and aggression and keep Russian forces from threatening NATO. Moldova in 2024 is similar to Ukraine between 2014 and February 2022, and the Kremlin has enacted elements of its hybrid war playbook in both states as part of its long-standing, strategic-level efforts to reshape the governance and geostrategic orientations of Ukraine and Moldova.

The Russian Federation may exploit its military and security ties to Transnistria to influence future negotiations on the Transnistrian conflict to establish long-term influence over Moldovan domestic and foreign policies or to invade and occupy all of Moldova, but the threat of a Russian invasion of Moldova through Ukraine is currently extremely low. Russia will likely continue to wield influence over Transnistria's negotiating position in any future negotiations even if Russia is not itself party to those talks. Russia's ability to militarily threaten Moldova may change in the future depending on the development of the battlefield situation in Ukraine. Russia may be able to launch a large-scale offensive in southwestern Ukraine towards Moldova while continuing to fight in eastern Ukraine.

Moldova's future as an independent and sovereign state is directly tied to the outcome of Russia's war in Ukraine and affects NATO defense planning. Russia could exploit a possible ceasefire in Ukraine to establish lines of communication to Transnistria by resuming flights from Russia over Ukrainian airspace, allowing Russia to build up its forces and means in Transnistria for future military operations against Moldova. A Russian invasion of Moldova becomes even more likely should Russia occupy Mykolaiv and Odesa oblasts in the future, let alone the entirety of Ukraine.

NATO is currently expanding what will be its largest base near Constanta in southeastern Romania, demonstrating the importance NATO places on this region in its defense against Russia. A Russian occupation of Moldova would increase these already strained defense requirements by forcing NATO to defend Romania's border with Moldova.

Moldovan and Ukrainian independence and territorial integrity would allow NATO to focus on its northeastern border with Russia and Belarus and would keep Russian forces further from the NATO base in Romania. Western partners have recently increased their military support to Moldova, but Moldova remains militarily weak. In Transnistria the presence of Russian troops is often mentioned as the main potential source of destabilization, hybrid threats. Ukraine's President Volodymyr Zelenskyy announced that Ukraine's security forces had obtained Russian plans to “destroy Moldova” using hybrid means, which was confirmed by Moldova's Information and Security Service. The government is aware of potential threats to stability and is working on building resilience in the security arena. Hybrid operations conducted by the Russian Federation against the Republic of Moldova in the political, economic, energy-related and social fields, including information and cyber operations, with the aim of undermining the constitutional order, derailing the European course of the country and/or disintegrating the state. The illegal military presence of the Russian Federation in the Transnistrian region and its control over the separatist entity and the war against Ukraine, Russia has on several occasions launched cruise missiles aimed at western Ukraine from the Black Sea, crossing Moldovan airspace. This also undermines Moldova's neutrality and has been condemned by Moldova as a violation of international law. Transnistria is relevant here not so much as a military staging post as in its role as a hub used by Russia to spread panic and disinformation. A potential weakening of Ukraine's independence and sovereignty as a result of a hypothetical military defeat against Russia poses an existential threat also to Moldova's survival as an independent, sovereign and democratic state. The war creates a risk of disruptions to gas transit through Ukraine. The war has increased food and energy prices, which will fuel Moldova's already high inflation.



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The Russian hybrid warfare against Moldova includes various forms of pressure, disinformation, support for riots and anti-government protests, illegal financing of political parties and opposition politicians, and even attempts to organize a coup d'état. In addition, Moscow still controls the separatist region in Transnistria, where it maintains a military operational group against Chişinău's will.

The Moldovan authorities have recently been relatively successful in taking steps to strengthen the country's resilience, notably by abandoning dependence on Russian gas and redirecting its energy imports, with the help of funding from Western institutions. Moldova is also in the process of adopting a new national security strategy, which will include a more realistic assessment of Russia. However, to strengthen Moldova's resilience against both Russia's military and hybrid threats and to ensure progress in Moldova's coming EU membership negotiations, more western support must come in the form of financial support, technical assistance to support public administration, support for various reforms, and for capacity building of Moldova's armed forces.

3.Conclusions

A Moldova in 2024 is similar to Ukraine between 2014 and February 2022, and the Russia has enacted elements of its hybrid war playbook in both states as part of its long-standing, strategic-level efforts to reshape the governance and geostrategic orientations of Ukraine and Moldova. Moldova has a frozen conflict with a Russian military exclave occupying a part of the country illegally. Moldova's security and future are closely linked with the outcome of Russia's war against Ukraine. This is a decisive year for the country and its government with local elections approaching, in which manipulation by Kremlin proxies is expected, and an economy affected by the energy crisis and rising prices due to the war. In February a new prime minister and government were appointed – a move meant to address security concerns, hybrid threats, and energy dependence on Russia and Transnistria. The government seems prepared to address the threats, yet Moldova strongly depends on EU support. Russia has always interpreted Moldova's neutrality as meaning that it cannot have any contact with NATO and should have no military capability of its own. The EU institutions and individual member states should also help to support the revitalisation of Moldova's stalled financial decentralisation reform. Most importantly, the EU and western institutions must continue to support Moldova financially. Moldova will need additional funding to continue its energy diversification strategy, and in order to overcome Russia's hybrid threats to critical infrastructure and support Moldova with countering the negative effects of Russia's war in Ukraine.