

Journal of Defense Resources Management



Journal of Defense Resources Management

Vol. 15, Issue 1 (28)/ 2024

Vol. 15, Issue 1 (28)/ 2024



**JOURNAL OF
DEFENSE
RESOURCES
MANAGEMENT**

Vol. 15, Issue 1 (28)/ 2024

BRASOV - ROMANIA

The Regional Department of Defense Resources Management Studies issues this journal twice a year. Its goal is to disseminate the results of the theoretical and practical research investigations undertaken by reputable professionals worldwide in the holistic field of defense resources management.

The Journal of Defense Resources Management (JoDRM) is currently indexed in the following prestigious international databases and catalogs: *Ulrich's Global Serials Directory, Directory of Open Access Journals (DOAJ), EBSCO - International Security & Counter-Terrorism Reference Center, Index Copernicus, Central and Eastern European Online Library (C.E.E.O.L.), ProQuest, WORLDCAT, Karlsruhe Virtual Catalog (KVK), Cengage GALE.*

INTERNATIONAL ADVISORY BOARD

Dr. TEODOR FRUNZETI, Professor - Academy of Romanian Scientists, (Romania)
Dr. MARY S. McCULLY, Professor - Information Resources Management College (iCollege), National Defense University, Washington DC (USA)
Dr. WILLIAM D. HATCH, Lecturer, MS - Graduate School of Business and Public Policy, Naval Postgraduate School, Monterey, CA (USA)
Dr. SHANNON E. FRENCH, Inamori Professor in Ethics - Case Western Reserve University, Cleveland, Ohio, USA
Dr. GRETA KEREMIDCHIEVA, Senior Lecturer - Rakovski Defense & Staff College, National Defense Academy, Sofia, (Bulgaria)
CRISTIANA (CHRIS) MATEI, Lecturer - Center for Civil-Military Relations (CCMR), Naval Postgraduate School, Monterey, CA (USA)
Dr. VLADAN HÖLCNER, Professor - Foreign Language Education Center, National University of Defense, Brno (Czech Republic)
Dr. PAVEL FOLTIN, Assistant Professor - Faculty of Military Leadership, National University of Defense, Brno (Czech Republic)
Dr. FLORIN-EDUARD GROSARU, Professor - Regional Department of Defense Resources Management Studies, Brasov, Romania
Dr. CATALIN CIOACA, Associate Professor, Eng. - "Henri Coanda" Air Force Academy (Romania)
Dr. ADRIAN LESENCIUC, Professor - "Henri Coanda" Air Force Academy (Romania)
Dr. MIRCEA BOSCOIANU, Professor, Eng. - "Transilvania" University, Brasov (Romania)
Dr. MUSTAFA KEMAL TOPCU, Lecturer - National Defense University (Turkey)
Dr. ALEXANDRU STOICA, Lecturer - "Carol I" National Defense University (Romania)
Dr. BADEA DOREL, Associate professor - "Nicolae Bălcescu" Land Forces Academy Sibiu, (Romania)
Dr. CONSTANTIN NICOLAE TOADER, Senior Scientist, Research and Innovation Center for CBRN Defense and Ecology (Romania)
Dr. CIPRIAN SAU, Senior Scientist, Research and Innovation Center for CBRN Defense and Ecology (Romania)
Dr. ILEANA TACHE, Professor - "Transilvania" University, Braşov (Romania)

EDITORIAL BOARD

Editor in Chief: Dr. CEZAR VASILESCU, Professor, Eng. - Regional Department of Defense Resources Management Studies (DRESMARA), Brasov, (Romania)
Deputy Editor in Chief: Dr. JOHN T. CHRISTIAN - College of Information and Cyberspace, National Defense University, Washington DC, (USA)
Executive Editor: Dr. AURA CODREANU, Associate Professor - Regional Department of Defense Resources Management Studies (DRESMARA), Brasov, (Romania)
Senior Editors: Dr. Mitch J. McCARTHY - Defense Resources Management Institute, Naval Postgraduate School, Monterey, California, (USA)
Dr. David C. EMELIFEONWU - Royal Military College, Kingston, (Canada)
Dr. Piotr GAWLICZEK - Cuiavian University, Wloclawek, Poland
Dr. Cristina Antonoaie, Lecturer - Regional Department of Defense Resources Management Studies (DRESMARA), Brasov, (Romania)
Dr. Livia TATAR (Romania)

The authors take full responsibility for the contents of their papers and for any copyright infringements. The articles in this journal do not reflect in any way the position of the editorial or advisory boards. No part of this publication may be reproduced, partially or totally, without the prior written permission of the editorial board.

PRINTED AT THE MILITARY TECHNICAL PUBLISHING CENTER
APRIL, 2024

EDITING GUIDELINES

- **Page setup:** top – 28mm, bottom – 28mm, inside – 21mm, outside – 24mm, header – 12.5mm, footer – 12.5mm, mirror margins activated;
 - paper format B5 176X250;
 - font: Times New Roman;
 - style: normal.
- **Paper title:** upper case, font size 14pt, bold, centred;
- **Author (s) name:** first name, surname, font size 12pt, bold, centred;
 - two free spaces below the title of the paper.
- **Author's workplace name:** one free space (12pt) below author's name, font 12pt, centered.
- **Abstract:** one free space (12pt) below author's workplace name;
 - up to 150 words;
 - font size 11pt, Italic, justified, left-right alignment.
- **Key words:** maximum 8;
 - one free space (12pt) below the abstract;
 - 11pt, italic, left alignment, separated by comma.
- **Paper body:**
 - odd number of pages (minimum 5);
 - no free space between lines;
 - two free spaces below the key words (24 pt);
 - two columns, width: 6cm, spacing: 0.5cm;
 - font size 12pt, justify.
 - paper main parts: introduced by titles numbered with Arabic figures, upper case, font size 12pt, bold, centered. One free space above the text and one free space (12pt) below it.
 - paragraph indentation: 6mm.
- **Drawings, diagrams and charts:** one free space below the text; PNG or JPEG image of 300 dpi resolution;
 - width similar to that of the column they belong to. Should this be impossible to achieve, then they will be printed across the whole breadth of the page either at the top or the bottom of the page.
 - numbered in Arabic figures;
 - accompanied by captions, one free space (12pt) below the drawings, centered, font size 12pt;
 - mathematical formulae: 6mm left alignment; ordinal numbers: in round brackets, right alignment; Times New Roman; Full - 12pt.; Subscript / Superscript - 9pt.; Sub-Subscript / Superscript - 7pt.; Symbol - 16pt.; Sub-Symbol - 12pt;
 - long mathematical formulae: not wider than the column or displayed on the whole width of the page either at the top or bottom of the page.
- **Names of organizations:** printed in Upper case, straight.
- **Names of military technology products:** in Upper case, Italic.
- **References:** in the order mentioned in the text, at the end of the article, numbered in Arabic figures. The titles of the reference articles, books and papers will be printed in Italic.
- **Reference citations:** numbered, in square brackets (e.g. [1]) in the text.

The authors take full responsibility for the contents and scientific correctness of their papers.

All articles will be sent to the e-mail address of the Editorial Board:

journalftgw@o.crp.ro
journalofdefense@yahoo.com

Journal website: <http://www.jodrm.eu>

CONTENTS

BUILDING RESILIENCE: ADVANCING DEFENSE ACQUISITION CAPABILITIES IN GEORGIA

Ivan OKROMTCHEDLISHVILI5

SUPPLY CHAIN RISKS AND MANAGEMENT STRATEGIES IN THE DEFENSE INDUSTRY

Goksel KORKMAZ.....35

FOLLOWERSHIP IN MILITARY ORGANIZATIONS: THE CASE OF THE ARMED FORCES OF THE PHILIPPINES

Noah HERNANDEZ; Jaime BALLENA IV.....61

STRATEGIES FOR ENHANCING MILITARY LEADERSHIP: A CASE STUDY OF VUCA PRIME IN THE COLOMBIAN AEROSPACE FORCE

Maribel Silva BARRERA95

EMPOWERING OF DEFENSE RESOURCES TO SUPPORT THE INDONESIAN ARMED FORCES' TASKS IN MAINTAINING REGIONAL STABILITY

Ali SETIANDY; A.K. SUSILO; ISKANDAR; Inong SOFIARINI.....109

MISSION COMMAND DURING LOW INTENSITY BATTLES AND STABILIZING OPERATIONS. ARE WE PREPARED?

Imran Aslam RATHORE131

IMPLICATIONS OF INTERNET AND SOCIAL MEDIA ADDICTION ON THE PERFORMANCE OF MEDICAL PERSONNEL IN CIVILIAN AND MILITARY HEALTH FACILITIES

Mihaela BARCAN; Laurentiu BARCAN.....145

**THE ROLE OF ENVIRONMENT IN MOLDING INDIVIDUAL
BEHAVIOR. STRUCTURAL-ECOPSYCHOLOGICAL
APPROACHES**

Maria Dorina PASCA.....175

**CONSIDERATIONS REGARDING THE EVOLUTION OF GROSS
DOMESTIC EXPENDITURE ON R&D (GERD) IN ROMANIA
AND EU COUNTRIES. PART I- TIME SERIES INDICATORS**

Cristina ANTONOAI.....183

BUILDING RESILIENCE: ADVANCING DEFENSE ACQUISITION CAPABILITIES IN GEORGIA

Ivan OKROMTCHEDLISHVILI

PhD in Business Administration

Associate Professor, Sulkhani-Saba Orbeliani University, Tbilisi, Georgia

This comprehensive article explores the global trends in defense acquisition processes, examining key practices in the United States, Canada, Australia, New Zealand, France, Germany, and the United Kingdom. Highlighting the diverse organizational structures and decision-making support systems, the article delves into challenges faced by each nation and strategies implemented for improvement. Drawing insights from the U.S. strategic planning and flexibility, Canada's multi-departmental approach, France's emphasis on innovation, the UK's integrated procurement and support, Germany's technological advancements, New Zealand's collaborative framework, and Australia's adaptability, the article presents a comparative analysis. It underscores the importance of joint capability management, strategic planning, flexibility, and international collaboration. In the context of Georgia, the article provides a glimpse into the current landscape of defense acquisition, focusing on key entities within the Ministry of Defense and their roles in shaping the country's defense acquisition capabilities. The findings underscore opportunities for fostering inter-departmental collaboration, leveraging innovation, optimizing logistical processes, strengthening international partnerships, enhancing personnel training, and fortifying legislative frameworks. Additionally, the study advocates for a structured defense acquisition framework inspired by international best practices, incorporating decision-making support systems, delineating clear acquisition phases, and implementing robust monitoring and evaluation mechanisms. The proposed recommendations aim to guide Georgia towards a more resilient, adaptive, and forward-looking defense posture in the dynamic global security landscape.

Key words: *Defense Acquisition, Strategic Vision, Capability Planning, Inter-Departmental Collaboration, Innovation in Defense, Logistical Efficiency, International Partnership, Risk Mitigation*

1. INTRODUCTION

In an era marked by dynamic geopolitical shifts and evolving

security challenges, the importance of robust defense acquisition capabilities cannot be overstated. Defense acquisition capabilities refer

to the capacity and proficiency of a military organization in obtaining, developing, and sustaining the necessary equipment, technology, and resources to meet its defense and security objectives. These capabilities encompass the entire process, from identifying needs and setting requirements to procurement, testing, and maintenance of military assets. Effective defense acquisition capabilities are crucial for ensuring a military's readiness, effectiveness, and ability to address evolving threats and challenges.

Nations worldwide are continually adapting to global trends, leveraging international best practices, and optimizing their defense acquisition models to ensure preparedness in the face of emerging threats. This article delves into the crucial realm of defense acquisition, with a specific focus on Georgia's endeavors to enhance its capabilities and build resilience.

As we navigate the intricate landscape of defense acquisition, it becomes imperative to explore global trends and best practices that shape the strategies of leading nations. A comparative analysis of defense acquisition models provides valuable insights into organizational structures, decision-making support systems, governance mechanisms, challenges faced, and strategies employed by nations at the forefront of defense preparedness.

Against this backdrop, we turn our attention to the current landscape of defense acquisition in Georgia. To comprehend the contemporary state of defense acquisition in Georgia, a retrospective glance into its historical context becomes imperative. Georgia's history of acquiring defense assets has been shaped by a myriad of factors, including geopolitical shifts, regional conflicts, and internal developments. In the early years of independence, Georgia faced difficulties after the Soviet Union's breakup, relying on old equipment and struggling with economic changes. Conflicts like those in Abkhazia and South Ossetia highlighted the need for a strong defense system. Despite efforts to modernize the armed forces in the 21st century, challenges persisted, including budget limits, technology gaps, and changing regional threats.

A comprehensive assessment of existing capabilities sets the foundation for identifying key areas that warrant improvement. By understanding the strengths and limitations of the current framework, Georgia can strategically enhance its defense acquisition capabilities to meet the demands of the contemporary security environment.

Drawing inspiration from international best practices, this article examines the lessons learned from other nations and evaluates their applicability to Georgia's unique

context. By distilling the experiences of leading defense forces, Georgia can glean valuable insights and tailor its approach to align with the nation's specific needs and challenges.

In conclusion, this article aims to provide a holistic view of the evolving landscape of defense acquisition, emphasizing the imperative for Georgia to fortify its capabilities. By synthesizing global trends, assessing domestic strengths and weaknesses, and drawing on international lessons, Georgia can position itself to navigate the complexities of the modern security landscape with resilience and adaptability.

2. GLOBAL TRENDS IN DEFENSE ACQUISITION PROCESSES

2.1 Overview of International Best Practices

2.1.1 The U.S. Department of Defense

The United States' Defense Acquisition process is intricately managed by the Department of Defense (DOD), involving various organizations within the DOD. The Office of the Under Secretary of Defense for Acquisition and Sustainment oversees procurement activities, playing a pivotal role in matters related to acquisition, contract administration, logistics, and more (OUSD A&S, n.d.).

2.1.1.1. Armed Services and Procurement Offices

Each armed service (Army, Navy, Marine Corps, Air Force, and Coast Guard) is supported by its respective procurement office, specializing in different aspects such as research and development, weapon systems acquisition, military equipment procurement, infrastructure development, and the acquisition of commercial products and support services.

Additional DOD Agencies Involved: Over 30 DOD agencies actively engage in defense procurement, including the Defense Logistics Agency, Defense Contract Management Agency, Defense Advanced Research Projects Agency (DARPA), Missile Defense Agency, and the National Security Agency (Auger, 2020a).

2.1.1.2. Decision-Making Support Systems

The Department of Defense operates three principal decision-making support systems:

- *Planning, Programming, Budgeting, and Execution (PPBE) Process*: Used for strategic planning, program development, and resource determination to align plans with the National Security Strategy within resource constraints.

- *Joint Capabilities Integration and Development System (JCIDS)*: Identifies, assesses, and prioritizes gaps in joint warfighting capabilities and recommends potential solution approaches.
- *Defense Acquisition System*: Manages the acquisition of weapon systems, automated information systems, and services. It allows for decentralized execution with a focus on flexibility, innovation, discipline, and accountability (DAG, 2013).

The DoD Acquisition Process comprises several phases, each subject to specific DoD regulations and federal statutes (**Fig. 1**). The phases are:

- Materiel Solution Analysis (MSA)
- Technology Maturation & Risk Reduction (TMRR)
- Engineering & Manufacturing Development (EMD)
- Production & Deployment (PD)
- Operations & Support (O&S)

After each phase, a Milestone Review (A, B, C) assesses compliance with regulations and statutes before progressing to the next phase (DAE, n.d.).

2.1.1.3. Defense Acquisition Phases

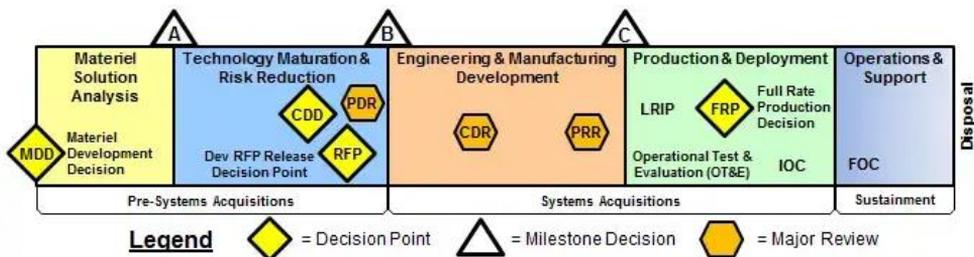


Fig. 1 Major Capability Acquisition Process

Source: The defense Acquisition Encyclopedia

<https://acqnotes.com/acqnote/acquisitions/acquisition-process-overview>

2.1.1.4. Defense Acquisition Categories

Acquisition programs are categorized based on funding and importance. Oversight is determined by the Acquisition Category (ACAT), with the Milestone Decision

Authority (MDA) appointed by DoD senior leadership. Major Defense Acquisition Programs (MDAPs) and Major Automated Information Systems (MAIS) have rigorous reporting requirements. ACAT levels are:

- ACAT I: R&D > \$524M, total procurement > \$3.065B
- ACAT II: R&D > \$200M, total procurement > \$920M
- ACAT III: Less than ACAT II (DAE, n. d.).

2.1.1.5. Adaptive Acquisition Framework

The Adaptive Acquisition Framework (AAF), outlined in DoD Instruction 5000.85 (DODI, 2020), empowers acquisition program personnel to plan and manage programs. Major Capability Acquisition is one of the six pathways within the framework.

2.1.1.6. Defense Acquisition System Details

- *Event-Based Process*: Acquisition programs move through milestone reviews and decision points that authorize entry into significant program phases.
- *Acquisition Categories*: Programs are categorized based on dollar value and management interest, subject to increasing levels of oversight.
- *Milestone Decision Authority (MDA)*: The Under Secretary of Defense for Acquisition, Technology, and Logistics (USD(AT&L)) serves as the MDA, with a Defense Acquisition Board (DAB) providing advice on critical acquisition decisions.

- *Overarching Integrated Product Team (OIPT)*: Supports the DAB by facilitating communication, vetting issues, and providing integrated assessments during milestone decision reviews (DAG, 2013).

2.1.1.7. Challenges and Recommendations for Improvement

RAND research identifies challenges in the acquisition process, including responding to evolving missions, leveraging a changing defense industrial base, accommodating interoperability, building in cybersecurity, planning for technology refresh, rebuilding the acquisition workforce, managing acquisition costs, and aligning incentives, organization, and processes with acquisition goals.

To address these challenges, an integrated set of actions is proposed, emphasizing tailored acquisition strategies, inclusive planning for the defense industrial base, and a properly sized, trained, and incentivized acquisition workforce to enhance flexibility and productive collaboration with industry partners (Wong et al., 2022).

2.1.2 Canada

Canada's defense procurement process is a complex and multi-departmental undertaking, involving key federal entities such as the

Department of National Defense (DND), Public Services and Procurement Canada (PSPC), Innovation, Science and Economic Development Canada (ISED), and the Treasury Board of Canada Secretariat. This collaborative approach, where each department has a defined role, distinguishes Canada's procurement strategy (Auger, 2020a).

2.1.2.1. Department of National Defense and Public Services and Procurement Canada (PSPC)

The Defense Production Act grants PSPC exclusive authority to purchase defense products for DND (DPA, 2023). Despite this, both departments maintain a partnering relationship, dividing responsibilities for the acquisition of goods and services and quality assurance. While DND establishes operational requirements and provides technical expertise, PSPC takes the lead in developing procurement plans, soliciting bids, coordinating industry engagement, and managing contracts (PSPC, n. d).

2.1.2.2. Innovation, Science and Economic Development Canada (ISED)

ISED administers the Industrial and Technological Benefits (ITB) Policy, introduced in 2014 as part of the Defense Procurement Strategy. This policy focuses on leveraging industrial and economic benefits for

Canada through defense procurement contracts, with a shift from regional to technology-focused investments. Bidders are evaluated based on their value proposition, including investments in the defense industry, work for Canadian suppliers, research and development, exports from Canada, and skills development (Government of Canada ITB, n. d.).

2.1.2.3. Treasury Board of Canada Secretariat

The Secretariat is responsible for developing overall procurement policies, approving preliminary funding for major capital projects, and conducting financial oversight. It plays a crucial role in ensuring that major projects approved by the Cabinet align with the government's procurement directives and guidelines (Government of Canada TBCSO, n. d.).

2.1.2.4. Other Federal Departments and Agencies

Various federal departments, including Finance, Fisheries and Oceans, Foreign Affairs, Trade and Development, and the Privy Council Office, are involved at different stages of the defense procurement process (Auger, 2020a).

2.1.2.5. Governance and Accountability

No single department or minister holds responsibility for the entire

process. The Defense Procurement Secretariat, created within PSPC, oversees the defense procurement process and coordinates strategy implementation. Reporting to the Deputy Ministers Governance Committee (DMGC), the Secretariat ensures collaboration among deputy ministers from relevant departments. The Working Group of Ministers, chaired by the Minister of Public Services and Procurement, promotes shared accountability and serves as a forum for discussion and issue resolution in major procurement projects (Government of Canada DPS, n. d.).

2.1.2.6. Challenges and Reforms

Despite recent efforts to simplify and modernize the process, challenges persist, with some large projects facing scheduling delays and cost overruns. Observers suggest that additional reforms, increased resources, and addressing the multiple points of authority and accountability could enhance efficiency and reduce bureaucracy (Auger, 2020). The potential creation of Defense Procurement Canada, as indicated in recent mandate letters to key ministers, signals a significant shift toward centralized procurement after decades of a decentralized, multi-departmental approach (Auger, 2020b).

2.1.3 Australia

In Australia, the Capability Acquisition and Sustainment Group (CASG), a part of the Department of Defense, oversees the procurement, through-life support, and disposal of weapon systems and military equipment for the Australian Defense Force. Formed in 2015, the CASG replaced the Defense Materiel Organization (DMO) with the aim of improving efficiency and cost-effectiveness in the acquisition process (Australian Government CASG, n. d.). However, challenges persist, as highlighted by the Australian National Audit Office (ANAO, 2023).

2.1.3.1. Organizational Structure and Evolution

Led by the Deputy Secretary CASG, the CASG employs about 5,000 people as of 2019. The establishment of CASG followed a series of defense procurement reviews and reforms, with one crucial review in 2008 proposing the separation of the DMO from the Department of Defense to enhance control, accountability, and transparency. While most recommendations were accepted and implemented by 2012, the DMO did not become an executive agency, with concerns over potential inefficiencies and operational impacts.

A subsequent 2014 review led to the disbandment of the DMO and the creation of CASG in 2015. The new organizational design aimed at reducing management layers and addressing issues of being "top heavy, complex, and unnecessarily deep" (Auger, 2020a).

2.1.3.2. Reforms and Challenges

Post-2015, ongoing reforms have targeted various aspects of the defense procurement process. These include improving project management accountability, revising the capability life cycle and defense investment approval process, early identification of challenges, risk minimization, and enhancing the training and reskilling of the CASG workforce.

Despite these efforts, concerns persist, as highlighted by the 2021 ANAO report. The report revealed an average schedule slippage across projects of approximately 23 months on the 21 largest defense procurement projects in 2020–2021, amounting to a cumulative total budget increase of 31.5%, or A\$18.3 billion. These figures indicate challenges in project timelines and budgetary management within the defense procurement process (ANAO, 2023).

The defense acquisition process in Australia, managed by CASG, reflects ongoing efforts to address

historical issues and streamline operations. The reforms implemented post-2015 underscore a commitment to improving efficiency and effectiveness. However, challenges, as outlined by ANAO, indicate that continuous efforts are required to achieve optimal outcomes in defense procurement in Australia.

2.1.4 New Zealand

In New Zealand, the Ministry of Defense and the New Zealand Defense Force (NZDF) collaboratively manage the Defense Capability Management System, ensuring the delivery of personnel, equipment, platforms, and other materiel necessary for military operations. The system spans the entire capability project life cycle, emphasizing joint efforts from both entities to achieve optimal outcomes (NZMOD DDC, n. d.).

2.1.4.1. Ministry's Role in Managing Defense Capability

The Secretary of Defense and the Chief of Defense Force share responsibility for the Capability Management System. The Secretary oversees the strategic policy, capability development, and procurement phases, while the Chief of Defense Force handles the introduction into service, in-service, and disposal phases. Together, they co-chair the Capability Governance Board, offering strategic governance,

portfolio-level risk management, and decision-making throughout the military capability life cycle. The Capability Management Framework guides the collaborative processes, roles, and responsibilities of the Ministry and the NZDF, ensuring integrated end-to-end capability management (NZMOD DDC, n. d.).

2.1.4.2. Capability Delivery Division

The Capability Delivery Division within the Ministry of Defense plays a pivotal role in leading multi-disciplinary teams responsible for defining, developing, and delivering military capability aligned with the government's Defense policy objectives. This collaborative effort involves personnel from both the NZDF and the Ministry. The division oversees major Defense capability projects, including source selection, contract negotiation and management, project management, and industry liaison. With an estimated value of around NZ\$20 billion for ongoing and planned projects until 2030, the division manages projects with a whole-of-life cost exceeding \$15 million (NZMOD CD, n. d.).

2.1.4.3. Defense Procurement Process

The Ministry of Defense and the NZDF jointly manage defense procurement. The Capability

Delivery Division takes charge of the total life cycle of the procurement process, starting with the development of requirements in collaboration with the NZDF. Key responsibilities include obtaining government approvals for procurement projects, conducting tendering and evaluation processes, liaising with industry, selecting sources of supply, negotiating contracts, and overall project management.

2.1.4.4. Challenges and Governance

With billions invested in major Defense capability projects, effective planning, reliable policies, practices, and governance are essential. The collaborative approach between the Ministry and the NZDF aims to ensure the delivery of defense products and capabilities on time, within budget, and in line with the government's expectations. The ongoing commitment to best practices, joint governance structures, and comprehensive life cycle management reflects New Zealand's dedication to a robust and accountable defense acquisition process (NZMOD DDC, n. d.).

2.1.5 France

In France, the General Directorate of Armaments - Direction générale de l'armement (DGA) plays a crucial role in the defense acquisition

process. As the central procurement agency for the Ministry of the Armed Forces, the DGA has evolved over the years to address the complex needs of France's armed forces. Beyond its domestic responsibilities, the DGA actively engages in fostering international collaboration and export promotion for the French defense industry (MOAF France PGDA, n. d.).

2.1.5.1. Innovative Approaches

The DGA is known for its innovative approaches to defense procurement, often emphasizing collaboration with industry partners, research institutions, and international allies. This collaborative ethos extends to the development of cutting-edge technologies, ensuring that France maintains a competitive edge in the global defense market (MOAF France PGDA, n. d.).

2.1.5.2. Strategic Export Role

France has a robust defense industry, and the DGA plays a key role in promoting exports of French defense products. By leveraging its expertise and the capabilities of the national defense industry, the DGA contributes to France's position as a significant player in the international arms market (MOAF France PGDA, n. d.).

2.1.5.3. Continuous Adaptation

The DGA has demonstrated adaptability to evolving security challenges and technological advancements. Its procurement strategies reflect a balance between meeting the current needs of the armed forces and investing in future capabilities, ensuring a comprehensive and forward-looking defense posture.

2.1.6 Germany

Germany's Federal Office of Bundeswehr Equipment, Information Technology and In-Service Support (BAAINBw) has undergone significant transformations to streamline defense procurement processes. As a central purchasing agent, the BAAINBw focuses on efficiency, technological innovation, and collaboration (Bundeswehr BAAINBw, n. d.).

2.1.6.1. Technological Advancements

Germany places a strong emphasis on technological advancements in defense capabilities. The BAAINBw, in collaboration with research institutes and technical centers, ensures that the Bundeswehr has access to state-of-the-art equipment and systems, keeping the armed forces technologically competitive (Bundeswehr BAAINBw, n. d.).

2.1.6.2. Holistic Approach

The BAAINBw's responsibilities span the entire life cycle of defense products, from development to in-service support. This holistic approach enables effective coordination, minimizing disruptions, and optimizing the operational readiness of the Bundeswehr (Bundeswehr BAAINBw, n. d.).

2.1.6.3. International Collaboration

Germany recognizes the importance of international collaboration in defense procurement. The BAAINBw actively engages with NATO allies and European partners to enhance interoperability, share best practices, and jointly address common security challenges (Bundeswehr BAAINBw, n. d.).

2.1.7 United Kingdom

The United Kingdom's Defense Equipment and Support (DE&S) embodies the country's commitment to efficient, integrated, and accountable defense procurement. DE&S, as an independent entity under the Ministry of Defense, has evolved to meet the challenges of delivering cutting-edge capabilities

to the UK's armed forces. It oversees and manages defense contracts for the UK Armed Forces as well as ensures proper sourcing, storage, and maintenance, prioritizing value for money in every contract to benefit the taxpayer. Additionally, DE&S handles decommissioning and disposal when equipment reaches the end of its service life. Its critical services support operational needs, including Defense Munitions sites, the British Forces Post Office, and Salvage and Marine Operations (MOD UK DE&S, n. d.).

2.1.7.1 .CADMID

CADMID, the initial acquisition model, follows the cycle of Concept, Assessment, Demonstration, Manufacture, In-Service, and Disposal (Fig. 2). An alternative version, CADMIT, replaces Disposal with Termination, acknowledging situations where there is nothing physically to dispose of. CADMID represents a comprehensive life-cycle value chain, emphasizing the need to consider all phases of capability throughout acquisition. It highlights that acquisition extends beyond mere purchase, emphasizing the importance of assessing the full lifespan of a capability (Richard, 2020).

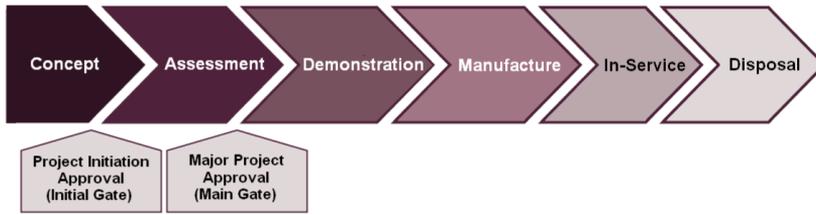


Fig. 2 The UK MoD’s CADMID cycle

Source: Richard, F. (2020). British Defense Acquisition – A Primer on the Process. DAILY NEWS, DEFENSE, EQUIPMENT, UK
<http://tinyurl.com/ysctc4zb>

2.1.7.2. Integrated Procurement and Support

DE&S was created through the integration of the Defense Procurement Agency and the Defense Logistics Organization. This integration aimed to create a seamless and integrated approach to procurement and support, ensuring a more coordinated and effective process (Auger, 2020a).

2.1.7.3. Strategic Oversight

The Minister for Defense Procurement provides strategic oversight, emphasizing a balance between meeting immediate defense needs and planning for future requirements. This governance structure ensures that the UK maintains a responsive and forward-looking defense posture (GOV UK MDP, n. d.).

2.1.7.4. Investment in Workforce

With a significant workforce of approximately 12,500 people,

including both civil servants and military personnel and stationed in over 150 locations globally (as of 2023), DE&S recognizes the importance of a skilled and motivated workforce. Continuous investment in training and development ensures that the organization can navigate the complexities of defense procurement and deliver high-quality outcomes (MOD UK DE&S, n. d.).

2.1.7.5. Adapting to Technological Changes

DE&S has adapted to rapid technological changes, incorporating innovation and agility into its procurement processes. This adaptability is crucial for responding to emerging threats and opportunities in the evolving landscape of defense capabilities (MOD UK DE&S, n. d.).

2.2 Comparative Analysis of Defense Acquisition Models

2.2.1 Evaluating Key Elements

As we delve into the global landscape of defense acquisition, it

becomes imperative to conduct a comparative analysis of key elements that define the efficiency and effectiveness of various models. These elements include organizational structure, decision-making support systems, governance mechanisms, challenges faced, and strategies for improvement.

2.2.1.1. Organizational Structure

The organizational structures of the defense acquisition agencies in the United States, Canada, Australia, New Zealand, France, Germany, and the United Kingdom exhibit diverse approaches. While the U.S. Department of Defense operates through a decentralized structure with multiple agencies involved, Canada follows a collaborative multi-departmental model. Australia, after a series of reviews, established the Capability Acquisition and Sustainment Group (CASG) to streamline processes. New Zealand employs a joint effort between the Ministry of Defense and the New Zealand Defense Force. France's Direction générale de l'armement (DGA) emphasizes collaboration and innovation, Germany centralizes through the Federal Office of Bundeswehr Equipment, and the UK's Defense Equipment and Support (DE&S) integrates procurement and support functions.

2.2.1.2. Decision-Making Support Systems

The decision-making support systems vary across nations. The U.S. employs the Planning, Programming, Budgeting, and Execution (PPBE) Process, Joint Capabilities Integration and Development System (JCIDS), and Defense Acquisition System. Canada focuses on collaboration between the Department of National Defense and Public Services and Procurement Canada, with emphasis on the Industrial and Technological Benefits (ITB) Policy. Australia, through CASG, emphasizes ongoing reforms to address challenges. New Zealand employs the Capability Management Framework. France's DGA is known for innovation, and Germany's BAAINBw emphasizes technological advancements. The UK's DE&S integrates procurement and support functions, adapting to technological changes.

2.2.2 Challenges and Strategies for Improvement

2.2.2.1. Common Challenges

Despite differences in organizational structures and decision-making support systems, common challenges emerge. These challenges include scheduling delays, cost overruns, adapting to evolving security challenges, maintaining a skilled workforce, and addressing accountability issues. Each nation

faces unique obstacles within its defense acquisition process, underscoring the complexity of this global endeavor.

2.2.2.2. Strategies for Improvement

To address these challenges, nations employ various strategies. The U.S. emphasizes flexibility, innovation, discipline, and accountability through the Defense Acquisition System. Canada is considering the creation of Defense Procurement Canada for centralized procurement. Australia focuses on ongoing reforms, increased resources, and potential centralization. New Zealand emphasizes joint governance, comprehensive life cycle management, and adherence to best practices. France prioritizes innovation and international collaboration. Germany emphasizes technological advancements and international cooperation. The UK's DE&S invests in workforce development and adapts to technological changes.

2.3 International Best Practices: Lessons Learned and Applicability to Georgia's Context

Drawing lessons from global trends in defense acquisition, Georgia can tailor its approach by considering the strengths and challenges

experienced by other nations. A collaborative, transparent, and adaptable strategy, coupled with strategic planning and international collaboration, can position Georgia for efficient and effective defense acquisition aligned with its unique geopolitical and security considerations.

The global trends in defense acquisition, as demonstrated by the diverse approaches of the U.S., Canada, Australia, New Zealand, France, Germany, and the United Kingdom, provide valuable insights and lessons that can be applied to Georgia's context. While each country has unique features and challenges, certain overarching principles can be drawn that are relevant to Georgia's defense acquisition efforts.

2.3.1 Decentralized vs. Centralized Acquisition Learning from Canada and Potential Reforms

- *Canada's Approach:* Canada's multi-departmental approach has its merits in collaboration and defined roles. However, ongoing challenges, including delays and cost overruns, underscore potential inefficiencies.

- *Applicability to Georgia:* Georgia should carefully evaluate whether a centralized or decentralized approach suits its unique circumstances. A transparent

and collaborative strategy that defines clear roles, responsibilities, and accountability could mitigate challenges experienced by Canada. Clearly define the roles and responsibilities of each department involved in defense acquisition to avoid duplication and enhance efficiency.

2.3.2 Innovation and Collaboration: Insights from France

- *France's Innovative Approaches:* France's DGA actively collaborates with industry partners and allies, emphasizing innovation to maintain a competitive edge.

- *Applicability to Georgia:* Encouraging innovation and collaboration with local industries and international allies can enhance Georgia's defense acquisition capabilities. Establishing partnerships with research institutions and industry players can foster technological advancements.

2.3.3 Efficiency and Accountability: Lessons from the United Kingdom

- *DE&S Integration in the UK:* The UK's DE&S integration showcases the benefits of a seamless and integrated approach to acquisition and support.

- *Applicability to Georgia:* Georgia can learn from the UK's emphasis on strategic oversight,

workforce investment, and adaptability to technological changes. A holistic approach that integrates acquisition and support functions can enhance efficiency and accountability.

2.3.4 International Collaboration: Insights from Germany

- *Germany's International Collaboration:* Germany actively engages with NATO allies and European partners to enhance interoperability and address common security challenges.

- *Applicability to Georgia:* Given Georgia's geopolitical location, fostering international collaboration is crucial. Building partnerships with neighboring countries and participating in regional defense initiatives can strengthen Georgia's defense acquisition capabilities.

2.3.5 Adaptability to Emerging Threats: Lessons from Australia

- *Australia's Post-2015 Reforms:* Despite ongoing challenges, Australia's commitment to reforms post-2015 reflects adaptability to address historical issues and streamline operations.

- *Applicability to Georgia:* Recognizing and addressing emerging threats promptly is essential. Georgia should establish

mechanisms for regular reviews and reforms to ensure its defense acquisition processes remain responsive and effective. Prioritize effective budgetary management to avoid schedule slippages and cost overruns in major defense projects.

2.3.6 Strategic Planning and Flexibility: Insights from the U.S.

- *U.S. PPBE Process:* The U.S. emphasizes strategic planning through the PPBE process, allowing flexibility within resource constraints.

- *Applicability to Georgia:* Georgia can benefit from a strategic planning process that aligns defense acquisition plans with national security objectives. Flexibility within budgetary constraints ensures a responsive and adaptable defense acquisition system. *Adopt an event-based process with milestone reviews*, enhancing transparency and accountability at each stage of acquisition programs.

2.3.7 Joint Capability Management: Collaboration Lessons from New Zealand

- *New Zealand's Collaborative Framework:* New Zealand's Defense Capability Management System emphasizes joint efforts between the Ministry of Defense and the New Zealand Defense Force (NZDF)

throughout the capability project life cycle.

- *Applicability to Georgia:* Adopting a collaborative approach, where the Ministry of Defense and the armed forces jointly manage defense acquisition, can enhance efficiency and effectiveness. Establishing joint governance structures, like New Zealand's Capability Governance Board, ensures strategic oversight, risk management, and integrated capability management.

3. CURRENT LANDSCAPE OF DEFENSE ACQUISITION IN GEORGIA

This part of the article will delve into the institutional frameworks that play a pivotal role in shaping and enhancing defense acquisition capabilities of Georgia. The focus will be on key entities such as the State Procurement Agency, the State Procurement Department of the Ministry of Defense (MOD), the Defense Policy and Development Department, the J-4 Logistics Planning Department, the J-5 Strategic Planning Department, the Command for Logistics Support of the Defense Forces, the State Military Scientific-Technical Center "Delta," and other structural units within the MOD.

3.1 Assessment of Existing Capabilities

3.1.1 State Procurement Agency (SPA): Facilitating Transparent and Effective Procurement

The State Procurement Agency serves as the linchpin in Georgia's defense acquisition landscape. Operating independently under the direct supervision of the Government of Georgia, the SPA plays a crucial role in managing funds from various sources. Its responsibilities span overseeing legality in public procurement procedures, promoting transparency, and ensuring the effectiveness of the Georgian Electronic Government Procurement System (Ge-GP). Through legislative initiatives, capacity building, and risk mitigation efforts, the SPA aims to foster good governance practices in defense acquisition (SPA, n.d.).

Furthermore, the SPA's collaboration with international partners, such as the EU-funded Twinning Project, has significantly contributed to aligning Georgia's public procurement practices with EU principles. The achievements in legislation development, remedy system improvement, and capacity building underscore the SPA's commitment to elevating defense acquisition standards (SPA, n.d.).

3.1.2 State Procurement Department of MOD: Orchestrating Defense Procurement Efforts

The State Procurement Department of the Ministry of Defense functions as a key player in orchestrating defense procurement processes. With tasks ranging from organizing procurement based on the state procurement plan to legal assessments, the department ensures the proper implementation of procedures. Its competencies extend to coordinating procurement processes, conducting electronic tender procedures, drafting procurement agreements, and managing customs procedures.

In essence, the department's role is pivotal in streamlining the acquisition of goods, services, and works for the Ministry of Defense. By participating in the annual plan drafting, providing legal assessments, and ensuring compliance with legislation, the State Procurement Department contributes to the efficiency and transparency of defense procurement (MOD, 2015).

3.1.3 Defense Policy and Development Department of MOD: Formulating Strategic Vision

The Defense Policy and Development Department assumes a strategic role in shaping defense

acquisition capabilities. Tasked with challenges and threat analysis, security environment assessment, and policy and planning document development, the department provides the foundational framework for defense policies. Its competencies span from assessing the efficiency of defense-wide systems to participating in budget coordination and interagency cooperation.

By engaging in strategic analysis, international cooperation, and legislative renewal, the Defense Policy and Development Department contributes to the formulation of a comprehensive and forward-looking defense acquisition strategy. The department's involvement in transparency, accountability, and civil society inclusion aligns with the broader goals of enhancing defense capabilities (MOD, 2018).

3.1.4 Reform Coordination and Monitoring Department of MOD: Providing Monitoring and Risk Management

The department supports defense transformation, monitors plan execution, and implements the ministry's risk management. It facilitates effective decision-making, enforces obligations, and analyzes results, promoting best practices. Tasks include controlling enforcement quality, serving as a secretariat, overseeing plan

execution, recommending reforms, and evaluating results. The department guides risk management, exercises legally mandated powers, and plays an important role in acquisition by ensuring effective decision-making and overseeing plan execution, reforms, and risk management (MOD, 2020a).

3.1.5 J-4 Logistics Planning Department of the General Staff: Ensuring Logistical Readiness

The J-4 Logistics Planning Department holds a critical position in ensuring logistical readiness for defense acquisition. Its functions, including analysis and assessment of logistical capabilities, strategic planning, coordination of movement, and infrastructure development, collectively contribute to the seamless integration of defense assets.

The divisional responsibilities, spanning logistics policy and planning, supply planning, armaments, equipment, and ammunition planning, underscore the multifaceted approach taken by the J-4 Logistics Planning Department. By aligning infrastructure development with the Strategic Development Plan, the department ensures that logistical support remains synchronized with overall defense goals (MOD, 2021).

3.1.6 J-5 Strategic Planning Department of the General Staff: Aligning Resources with Strategic Objectives

The J-5 Strategic Planning Department plays a central role in aligning resources with strategic objectives. Competent in military policy and strategic planning, capability identification, force development plan, resource management, and international cooperation, the department must ensure a holistic approach to defense acquisition.

Defense acquisition demands meticulous planning and efficient resource allocation. The J-5 Strategic Planning Department plays a crucial role in both the capability planning and acquisition process.

At the core of defense acquisition lies the J-5's role in capability planning, shaping the force development plan. This plan prioritizes capability requirements, aligning with MOD policy guidance and fiscal constraints. Timely completion informs subsequent programming and budgeting processes.

Deficiencies in capability planning impact resource management efficiency, risking operational inefficiencies and compromised readiness. The J-5 Department's expertise mitigates risks, ensuring a robust and forward-looking capability planning process.

In summary, J-5 is a cornerstone in defense acquisition and capability planning, aligning resources with strategic goals. As the custodian of the capability planning process, it must ensure a realistic force development plan, driving sustainability, efficiency, and effectiveness in defense programs amid evolving global security dynamics (MOD, 2021).

3.1.7 Command for Logistics Support of the Defense Forces: Synchronizing Acquisition Functions

The Command for Logistics Support plays a crucial role in synchronizing acquisition-related tasks, ensuring readiness, and supporting troops. From property provision to infrastructure development and state procurement, the command actively participates in acquisition functions. By engaging in legal assistance, equipment modernization, and logistical planning, it ensures a comprehensive approach to supporting defense forces.

The command's involvement in medical activities coordination, ammunition storage certification, and inventory and maintenance reflects its diverse responsibilities in maintaining logistical readiness. The ability to adapt to diverse situations and actively participate in acquisition functions positions the Command for

Logistics Support as a linchpin in the overall defense acquisition landscape (MOD, 2014).

3.1.8 State Military Scientific-Technical Center (SMSTC) "Delta": Innovating Defense Acquisition

As a key player in Georgia's defense acquisition landscape, the SMSTC "Delta" focuses on innovation and technological advancement. With functions ranging from research and development to disposal and utilization, the center actively contributes to shaping defense capabilities.

The center's engagement in international cooperation, testing and compliance, and entrepreneurial activities showcases its dynamic role in aligning with national defense objectives and international standards. By actively participating in various acquisition-related functions, "Delta" ensures that Georgia remains at the forefront of technological advancements in defense (MOD, 2020b).

3.1.9 Other Structural Units of the General Staff: Coordinated Acquisition Efforts

While specific departments and commands play specialized roles in defense acquisition, other structural units within the General Staff contribute to the overall coordination of acquisition efforts. The J-1

Personnel Department ensures optimal personnel levels and trends, actively participating in planning and mobilization. The J-2 Intelligence Department significantly aids acquisition through military intelligence, providing critical information for defense forces. The J-3 Operational Planning Department, although not explicitly involved in acquisition, plays a vital role in military planning and international engagements.

The J-6 Department of Communications and Information Systems focuses on planning and executing communication systems, ensuring the acquisition of compatible military communication technologies. The J-7 Department of Military Education and Combat Training plays a crucial role in shaping and enhancing military education and combat training systems, indirectly contributing to acquisition efforts by ensuring well-trained personnel.

In essence, these structural units collectively contribute to the coordinated and comprehensive acquisition landscape, ensuring that personnel, intelligence, and communication aspects are seamlessly integrated into the overall defense strategy (MOD, 2021).

3.1.10 Summary

The institutional frameworks discussed in this section collectively

form the backbone of Georgia's defense acquisition landscape. From the State Procurement Agency ensuring transparent and effective procurement to the State Military Scientific-Technical Center "Delta" driving innovation, each entity plays a unique and critical role. The collaborative efforts of these institutions, guided by strategic vision and international cooperation, will be instrumental in propelling Georgia's defense acquisition capabilities into a more resilient and adaptive future. As we navigate the complexities of the present landscape, these institutions serve as the pillars upon which Georgia can build a robust and forward-looking defense acquisition strategy.

4. IDENTIFICATION OF KEY AREAS FOR IMPROVEMENT IN GEORGIA'S DEFENSE ACQUISITION

4.1 Strategic Vision, Long-Term Capability Planning and Coordination

- *Observation:* While individual departments such as the J-5 Strategic Planning Department and the Defense Policy and Development Department contribute to strategic planning, there may be scope for enhancing inter-departmental coordination to ensure a more

cohesive and integrated defense acquisition strategy.

- *Recommendation:* Strengthen mechanisms for collaboration and information-sharing among key departments, fostering a unified strategic vision for defense acquisition. Develop a more comprehensive and long-term capability planning process. This involves aligning defense acquisition strategies with the country's long-term defense goals, considering emerging threats, and ensuring that the acquisition process is adaptable to evolving security challenges.

4.2 Capability Planning and Innovation

- *Observation:* The State Military Scientific-Technical Center "Delta" focuses on innovation; however, there may be opportunities to enhance the integration of cutting-edge technologies into the broader capability planning process.

- *Recommendation:* Foster closer collaboration between the J-5 Strategic Planning Department and "Delta" to ensure that technological advancements are seamlessly incorporated into capability planning and development. Explore opportunities for public-private partnerships (PPPs) in defense acquisition. Engaging the private sector can bring innovation, efficiency, and cost-effectiveness to acquisition processes. Clear

guidelines and incentives for private sector participation should be established.

4.3 Logistical Readiness and Efficiency

- *Observation:* The J-4 Logistics Planning Department and Command for Logistics Support of the Defense Forces play a critical role in logistical readiness, but there could be improvements in optimizing logistical processes for more efficiency.

- *Recommendation:* Conduct a thorough review of logistical processes, identifying areas for streamlining and optimizing resource utilization to enhance overall logistical readiness.

4.4 International Collaboration

- *Observation:* While international collaboration is mentioned, there may be opportunities to strengthen partnerships and learn from best practices in defense acquisition from countries with successful models.

- *Recommendation:* Establish forums or platforms for increased international collaboration, allowing Georgia to benefit from the experiences and innovations of other nations in defense acquisition. Strengthen partnerships and knowledge-sharing initiatives with countries possessing advanced defense acquisition systems.

Learning from global best practices can provide valuable insights for enhancing Georgia's defense acquisition capabilities.

4.5 Personnel Training and Development

- *Observation:* The role of the J-7 Department of Military Education and Combat Training as well as other educational entities of the MOD indirectly contributes to acquisition efforts through personnel training. However, there may be areas for improvement in aligning training programs with the evolving needs of defense acquisition.

- *Recommendation:* Regularly assess and update training programs to ensure that personnel possess the necessary skills and knowledge required for efficient and effective defense acquisition. Invest in capacity building and training programs for personnel involved in defense acquisition. This should cover areas such as acquisition/procurement regulations, international best practices, risk management, project management and the use of advanced technologies to enhance efficiency and effectiveness in the acquisition process. Emphasize the integration of advanced technologies, such as digital platforms for procurement, data analytics, and artificial intelligence, to streamline processes, reduce manual interventions, and

enhance the overall effectiveness of defense acquisition.

4.6 Legislative Enhancements

- *Observation:* The State Procurement Agency has been involved in legislative initiatives and risk mitigation, but continuous efforts may be needed to adapt to changing circumstances. There should be a focus on strengthening the legislative framework governing defense acquisition.

- *Recommendation:* Regularly review and update acquisition/procurement legislation, incorporating best practices to mitigate risks and ensure the adaptability of acquisition processes to emerging challenges. This includes clarifying the roles, responsibilities, and powers of each entity involved, ensuring legal compliance, and providing a robust legal foundation for transparent and effective acquisition processes; Strengthen measures to enhance transparency and combat corruption in defense acquisition. This includes implementing open and competitive procurement processes, whistleblower protection mechanisms, and rigorous anti-corruption measures to build public trust and ensure integrity in the acquisition system.

4.7 Risk Mitigation

- *Observation:* Reform Coordination and Monitoring Department guides risk management in the MOD, ensuring effective decision-making, overseeing plan execution,

and managing reforms. Continuous enhancement of the risk management process is deemed essential for effective defense acquisition.

- *Recommendation:* Enhance the existing risk management framework to proactively identify, assess, and mitigate risks associated with defense acquisition. This involves thorough risk analysis at each stage of the acquisition process, with a focus on preventing delays, cost overruns, and other potential challenges.

4.8 Centralized Acquisition Oversight

- *Observation:* While various departments are involved in defense acquisition, there's a need for a *centralized coordinating body* to enhance collaboration, streamline processes, and ensure accountability.

- *Recommendation:* Evaluate the feasibility of establishing a *centralized Defense Acquisition Authority within the Civil Office of the MOD* or enhancing the role of an existing body to provide comprehensive oversight and coordination of defense acquisition activities.

4.9 Division of Responsibilities Between GDF and MOD

- *Observation:* Various structural units of GDF and MOD participate in defense acquisition process. Therefore, there's a need for a clear *division of responsibilities between GDF and MOD* in the acquisition process.

- *Recommendation:* Here are recommendations for the MOD of Georgia regarding the division of responsibilities between the Georgian Defense Forces and the Ministry of Defense in the acquisition process:

4.9.1. Strategic Oversight and Leading

- ✓ Assign the Ministry of Defense the role of developing and overseeing strategic policy; ensuring analysis and assessment of capability proposals; leading multi-disciplinary teams staffed with personnel from both the GDF and the Ministry and responsible for defining, developing, and delivering military capability aligned with the Defense policy objectives; overseeing major Defense acquisition projects, including source selection, contract negotiation and management, project management, and industry liaison; leading programming, budgeting and procurement phases.
- ✓ Establish a *Capability Management System* to guide collaborative processes, roles, and responsibilities.

4.9.2. Capability Requirements, Implementation, Operations and Disposal

- ✓ Entrust the Georgian Defense Forces with responsibilities for the development of capability proposals, providing technical

expertise, introduction into service, in-service, and disposal phases of military capabilities.

- ✓ Ensure a *clear delineation of duties* between the Ministry and the Defense Forces to avoid overlap and enhance efficiency.

4.9.3. Collaborative Decision-Making

- ✓ Form a *joint Capability Governance Board*, co-chaired by the Minister of Defense and the Chief of Defense Force.
- ✓ Empower the Board to provide strategic governance, conduct portfolio-level risk management, and make decisions throughout the military capability life cycle.

4.9.4. Integrated Framework

- ✓ Adopt a *Capability Management Framework* inspired by the New Zealand model to guide the integrated end-to-end capability management process.
- ✓ *Clarify the roles and responsibilities* within this framework to facilitate smooth collaboration and coordination.

4.10 Decision-Making Support Systems

- *Observation:* The U.S. Department of Defense operates three primary decision-making support systems. *The PPBE Process* involves strategic planning, program development, and resource determination within resource constraints to align with the National

Security Strategy. *The JCIDS system* identifies, assesses, and prioritizes gaps in joint warfighting capabilities, proposing effective solution approaches. *The Defense Acquisition System* manages the acquisition of weapon systems, automated information systems, and services, emphasizing decentralized execution with a focus on flexibility, innovation, discipline, and accountability.

- *Recommendation:* In enhancing Georgia's defense acquisition capabilities, adopting decision-making support systems akin to the U.S. Department of Defense is crucial. Here are key recommendations:

4.10.1. Incorporate Capability-Based Planning (CBP)

The primary challenge for defense planners is optimizing military capabilities and associated readiness states. Two fundamental approaches, Threat-Based Planning (TBP) and Capability-Based Planning (CBP), exist. While TBP concentrates on well-defined threats, CBP is advantageous for multifaceted, uncertain challenges. CBP, embracing uncertainty, focuses on planning for a wide range of modern-day challenges, considering both generic possibilities and specific threats (Borzillo et al., 2021).

4.10.2. Implement Effective Program Budgeting (PB) System

Program budgeting, a performance-oriented system,

considers both inputs and outputs/outcomes. Defined as groups of outputs with a common intended outcome, programs play a strategic role in managing finances and linking policy and strategy to budgetary allocations over a medium-term period. An effective program budgeting system hinges on proper “definition of programs and other elements of the so-called program hierarchy” (Okromtchedlishvili, 2022, p. 89). The design choice should align with the institution's goals, considering culture, limitations, and capabilities. Defense programs, encompassing combat, combat support, or administrative functions, should be *result-based*, providing quantifiable terms for financial and performance management (Okromtchedlishvili, 2022).

4.10.3. Summary

The CBP process aims to create comprehensive proposals for the desired military capability by identifying and prioritizing capability gaps, based on strategic policy guidance, scenarios, and concepts. These proposals are then translated into specific defense program plans during the PB process. Effective implementation of CBP and PB is crucial for aligning required capabilities, produced outputs, and desired outcomes defined by National Defense objectives, ultimately enhancing the sustainability and utility

of Defense Forces (Okromtchedlishvili, 2023).

4.11 Acquisition Phases

- *Observation:* In the U.S. DoD acquisition process, distinct phases such as Materiel Solution Analysis (MSA), Technology Maturation & Risk Reduction (TMRR), Engineering & Manufacturing Development (EMD), Production & Deployment (PD), and Operations & Support (O&S) are meticulously aligned with specific regulations. Milestone Reviews (A, B, C) assess compliance before advancing to the next phase. The British Defense Acquisition model - CADMID, initially Concept, Assessment, Demonstration, Manufacture, In-Service, and Disposal, forms a comprehensive life-cycle value chain. The alternative CADMIT, replacing Disposal with Termination, recognizes scenarios without physical disposal and emphasizes considering all capability phases. This highlights the holistic nature of acquisition, extending beyond purchase, emphasizing thorough evaluation of a capability's entire lifespan.

- *Recommendation:* In enhancing Georgia's defense acquisition capabilities, a structured and strategic approach to defense acquisition and adoption of an *event-based process with milestone reviews*, enhancing transparency and accountability at each stage of acquisition process, are essential. The following recommendations outline a

phased process tailored to Georgia's context. These steps, coupled with thorough assessments and adaptability, aim to fortify Georgia's defense acquisition landscape.

4.11.1. Defense Acquisition Phases (Fig. 3)

4.11.1.1. Capability Proposals Development (CPD)

Identify defense capability requirements based on a thorough assessment of Georgia's needs and challenges, aligning with strategic policy guidance, scenarios, and concepts.

Prioritize capability gaps and develop proposals to address them. If a material solution is needed, initiate the acquisition process, assigning a project manager and integrated project team.

4.11.1.2. Material Solutions Exploration & Analysis (MSEA)

Explore potential material solutions, including new weapon systems, equipment, or infrastructure, conducting in-depth analyses of different options.

Evaluate available technologies, proactively mitigate risks, and establish a robust technological and acquisition foundation. Submit relevant, affordable, and feasible alternatives for approval.

4.11.1.3. System Procurement Planning (SPP)

Strategically plan the procurement process, considering internal or

external sources and potential public-private partnerships.

4.11.1.4. System Procurement & Testing (SPT)

Efficiently procure the chosen defense system and conduct rigorous testing to ensure reliability and effectiveness.

4.11.1.5. Operational Integration & Maintenance (OIM)

Seamlessly integrate the defense system into operational activities and establish comprehensive maintenance protocols for sustained effectiveness.

4.11.1.6. Support & Adaptation (SA)

Provide continuous support, training, and adaptations to meet evolving defense needs and challenges effectively.

4.11.1.7. Disposal or Termination (DT)

Conduct a thorough assessment of systems reaching the end of their lifecycle. Develop and implement a structured disposal/termination strategy aligned with environmental regulations and security protocols, ensuring responsible and secure practices.



Fig. 3 Sample Defense Acquisition Phases

Source: Developed by the author

Note: After completing each phase, it is recommended to conduct a comprehensive review to assess compliance and effectiveness before progressing to the next stage.

4.12 Monitoring and Evaluation Mechanisms

- *Observation:* While there are units overseeing plan execution and result evaluation, it is advisable to enhance capabilities in specific monitoring and evaluation mechanisms for assessing the effectiveness of defense acquisition efforts.

- *Recommendation:* Establish a robust system for monitoring and evaluating the performance of defense acquisition processes. This includes regular assessments of acquisition timelines, cost-effectiveness, and the ability to meet the evolving needs of the armed forces. Implementing key performance indicators (KPIs) can aid in this process.

By addressing these key areas, Georgia can further enhance the efficiency, effectiveness, and adaptability of its defense acquisition processes, ensuring a resilient and forward-looking defense posture.

5. CONCLUSION

As we conclude our exploration into the realm of defense acquisition in Georgia, it is evident that building resilience and advancing capabilities are paramount considerations in navigating the complexities of the modern security landscape. The comparative analysis of defense acquisition models from leading nations has offered valuable insights into organizational structures, decision-making systems, and strategies for overcoming common challenges.

The current landscape of defense acquisition in Georgia, scrutinized through the lenses of various key entities such as the State Procurement Agency, the State Procurement Department of the Ministry of Defense, and the J-5 Strategic Planning Department, reveals a multifaceted approach. These institutions collectively serve as the backbone of Georgia's defense acquisition landscape, each playing a unique and critical role.

Identifying key areas for improvement has been a focal point,

emphasizing the need for strategic vision, long-term capability planning, innovation integration, logistical efficiency, international collaboration, personnel development, risk mitigation, etc. Recommendations have been outlined to guide Georgia in fortifying its defense acquisition capabilities, ensuring adaptability and responsiveness to emerging threats.

Drawing lessons from international best practices, the article advocates for a collaborative, transparent, and adaptable strategy in line with Georgia's unique geopolitical and security considerations. The experiences of countries such as Canada, France, the United Kingdom, Germany, Australia, the United States, and New Zealand underscore the importance of tailored approaches to defense acquisition, reflecting a balance between innovation, efficiency, and strategic oversight.

In essence, the path to resilience and advancement in defense acquisition for Georgia lies in synthesizing global insights, strengthening institutional capacities, fostering collaboration, and continuously adapting to the evolving security landscape. By implementing the recommended improvements and drawing inspiration from successful international models, Georgia can position itself at the forefront of

defense preparedness, ensuring a robust and forward-looking defense acquisition strategy for the challenges of tomorrow.

REFERENCES

- [1] Auger, M. (2020a). Defence procurement organizations worldwide: a comparison. Publication No. 2019-52-E28, Economics, Resources and International Affairs Division Parliamentary Information and Research Service, library of Parliament, Ottawa, Canada. <http://tinyurl.com/49tdvr8k>
- [2] Auger, M. (2020b). The Evolution of Defense Procurement in Canada: A Hundred-Year History. Publication No. 2020-54-E, Economics, Resources and International Affairs Division Parliamentary Information and Research Service, library of Parliament, Ottawa, Canada. <http://tinyurl.com/267vck4x>
- [3] Australian Government. Capability Acquisition and Sustainment Group (CASG). <http://tinyurl.com/yeytyk5u>
- [4] Australian National Audit Office (ANAO). (2023). 2021–22 Major Projects Report. <http://tinyurl.com/2s3aruja>
- [5] Borzillo, L., Philippe Dumas, P., Fortier, M., Hollander, H., Imre-Millei, B., Massie, J., Munier, M., Heni Pupco, H., & Raymond, C. (2021). Threat-based defense planning: implications for Canada. <https://ras-nsa.ca/wp-content/uploads/2021/03/Report-on-CJOC-Defence-Planning-Project.pdf>
- [6] Bundeswehr BAAINBw <https://www.bundeswehr.de/en/organisation/equipment/organization/baainbw>
- [7] Defense Acquisition Encyclopedia (DAE) <http://tinyurl.com/5dpym5mw>
- [8] Defense Acquisition Guidebook (DAG), 2013 <http://tinyurl.com/334y8xx7>
- [9] Defense Production Act (DPA), 2023 <https://laws-lois.justice.gc.ca/eng/acts/d-1/>
- [10] DOD INSTRUCTION 5000.85 (DODI). (2020). MAJOR CAPABILITY ACQUISITION. Office of the Under Secretary of Defense for Acquisition and Sustainment. <http://tinyurl.com/56dfwy43>
- [11] Government of Canada. Defense Procurement Strategy (DPS). <http://tinyurl.com/bddnea78>
- [12] Government of Canada. Industrial and Technological Benefits (ITB). <https://ised-isde.canada.ca/site/industrial-technological-benefits/en>
- [13] Government of Canada. Treasury Board of Canada Secretariat Organization (TBCSO). <https://www.canada.ca/en/treasury-board-secretariat/corporate/organization.html>
- [14] Government of the (GOV UK). Minister of State (Minister for Defense Procurement, MDP) <http://tinyurl.com/yc6arx2y>
- [15] Minister of Defense of Georgia (MOD). (2014). On approval of the regulations of the Command for Logistics Support of the Defense Forces of the Ministry of Defense of Georgia. Order №44, Tbilisi https://mod.gov.ge/uploads/public/normatuli_aqtebi/44_1.pdf
- [16] Minister of Defense of Georgia (MOD). (2015). On approval of the regulations of the State Procurement Department of the Ministry of Defense of Georgia. Order №31, Tbilisi <http://tinyurl.com/2p48rsvf>
- [17] Minister of Defense of Georgia (MOD). (2018). On approval of the regulations of the Defense Policy and Development Department of the Ministry of Defense of Georgia. Order №38, Tbilisi https://mod.gov.ge/uploads/public/normatuli_aqtebi/38.pdf

- [18] Minister of Defense of Georgia (MOD). (2020a). On approval of the regulations of the Reform Coordination and Monitoring Department of the Ministry of Defense of Georgia. Order №66, Tbilisi <https://www.matsne.gov.ge/ka/document/view/4923974?publication=0>
- [19] Minister of Defense of Georgia (MOD). (2020b). On approval of the regulations of the legal entity of Public Law-the State Military Scientific-Technical Center "Delta". Order №40, Tbilisi <https://www.matsne.gov.ge/ka/document/view/4862300?publication=0>
- [20] Minister of Defense of Georgia (MOD). (2021). On approval of the regulations of the General Staff of the Defense Forces of the Ministry of Defense of Georgia. Order №17, Tbilisi <https://www.matsne.gov.ge/ka/document/view/5143035?publication=0>
- [21] Ministry of Defense (MOD UK). Defense Equipment & Support (DE&S). About DE&S. <https://des.mod.uk/who-we-are/>
- [22] Ministry of Defense (MOD UK). Defense Equipment & Support (DE&S). <https://des.mod.uk/who-we-are/>
- [23] Ministry of the Armed Forces (MOAF France). Presentation of the General Directorate of Armaments (PGDA). <http://tinyurl.com/bd23668u>
- [24] New Zealand Ministry of Defense (NZMOD). CAPABILITY DELIVERY (CD). <https://www.defence.govt.nz/who-we-are/our-structure/capability-delivery/>
- [25] New Zealand Ministry of Defense (NZMOD). DELIVERING DEFENCE CAPABILITY (DDC). <https://www.defence.govt.nz/what-we-do/delivering-defence-capability/>
- [26] Office of the Under Secretary of Defense for Acquisition & Sustainment (OUSD A&S). <https://www.acq.osd.mil/>
- [27] Okromtchedlishvili, Ivan. (2022). Proposals on Defense Program Structure: The Case of the Ministry of Defense of Georgia. Journal of Defense Resources Management (JoDRM), Volume 13, Issue no. 1(24), pp. 88-105 http://www.jodrm.eu/issues/Volume13_issue1/06_OKROMTCHEDLISHVILI.pdf
- [28] Okromtchedlishvili, Ivan. (2023). Capability-Based Planning and Program Budgeting Approaches: Enhancing Sustainability and Utility of Defense Forces. Journal of Defense Resources Management, Volume 14, Issue no. 2 (27), pp. 21-32 http://www.jodrm.eu/issues/Volume14_issue2/2_OKROMTCHEDLISHVILI.pdf
- [29] Public Services and Procurement Canada (PSPC). <https://www.canada.ca/en/public-services-procurement.html>
- [30] Richard, F. (2020). British Defense Acquisition – A Primer on the Process. DAILY NEWS, DEFENSE, EQUIPMENT, UK <http://tinyurl.com/ysctc4zb>
- [31] State Procurement Agency of Georgia (SPA). <http://procurement.gov.ge/en/page/features; http://tinyurl.com/42esbru2>
- [32] Wong, Jonathan P. et al. (2022). Improving Defense Acquisition. RAND Corporation, Santa Monica, Calif <http://tinyurl.com/4hjy4as9>

ACKNOWLEDGMENT

The author takes full responsibility for the contents and scientific correctness of the paper.

SUPPLY CHAIN RISKS AND MANAGEMENT STRATEGIES IN THE DEFENSE INDUSTRY

Goksel KORKMAZ, PhD

Ministry of National Defense, Turkiye

This study aims to explore the risks within the defense industry supply chain—a realm with limited existing research. The focus is on understanding these risks, their potential impacts, and evaluating mitigation measures and risk management strategies. The examination encompasses various facets of supply chain risks, categorizing them into supplier-related risks, risks stemming from globalization and foreign dependency, sector-specific risks, and cyber security risks. The study delves into the effects of these risks specifically within the defense industry context. Notably, it also presents actionable measures and determinations related to risk management strategies. The primary contribution of this study lies in providing a comprehensive framework for managing risks within the defense supply chain, emphasizing the "how" rather than just the "what."

Key words: *Supply chain risks, supplier risks, foreign dependency, defense sector, defense acquisition.*

1. INTRODUCTION

Resource-based theory suggests that the success of businesses is contingent upon three types of resources: physical, human, and organizational capital. However, for these resources to confer a competitive advantage, they must possess characteristics such as being valuable, rare, inimitable, superior, and organized systematically (Barney, 1991). Additionally, the capabilities of an institution serve as a complementary element to its resources and are crucial in explaining variations in performance,

even when resources are identical (Gunasekaran et al., 2017). On the contrary, an alternative perspective posits that the primary variable influencing an institution's success is the dynamics of the industry in which it operates (Porter, 1981). Indeed, a more comprehensive understanding may be that both viewpoints are complementary, as organizations must align their resources and capabilities with the specific needs of their industry (Gellweiler, 2018). Effectively managing supply chain risks in accordance with physical, human, and organizational resources, as well as industry dynamics, can be

considered a vital capability for corporate competition and sustainability (Srivastava and Rogers, 2021: 3).

Supply chain management involves overseeing the material, information, financial flows, and network of relationships between independent organizations—from suppliers to end customers, in both forward and backward directions—with the aim of maximizing profits and customer satisfaction (Stock and Boyer, 2009). Presently, organizations increasingly rely on suppliers to support critical functions, a trend that has significantly accelerated in the last decade and is expected to continue due to factors such as globalization, outsourcing, and digitalization. The interconnected nature of supply chains, where suppliers have their own suppliers, exposes these networks to various threats, including cyber threats and external disruptions like severe weather and geopolitical unrest. Consequently, the significance of supply chain resilience, business continuity, and disaster recovery planning has risen (NIST, 2020). Inability to effectively address supply chain risks leads to disruptions in business operations. While past supply chain management focused on cost reduction, affordable procurement, and inventory management improvement, the current landscape emphasizes the

importance of supply chain sustainability for overall business success (Samvedi et al., 2013).

Post-COVID-19 global risk studies consistently highlight supply chain risks among the most critical. For instance, in a survey by Allianz of nearly 2,800 businesses across 92 countries, business interruption due to supply chain disruptions emerged as the foremost risk, with 94% of businesses reporting such interruptions in 2020 (Gosh, 2021). Supply chains are only as robust as their weakest link; hence, as the chain expands, its susceptibility increases. Presently, global supply chains grapple with significant disruptions affecting the container market, shipping routes, ports, airlines, truck lines, railways, and even warehouses. These disruptions lead to shortages in crucial production components, order backlogs, delivery delays, increased transportation costs, and higher consumer prices. If the situation is not rectified promptly, the consequences for the global economy could be severe (Friesen, 2021). Adapting to today's dynamic environment and responding swiftly to changes necessitates the design, development, and maintenance of a flexible supply chain. Globalization, shorter product life cycles, intricate trade partnerships spanning numerous countries, market demand uncertainties, cost pressures, outsourcing, and offshoring represent

significant sources of supply chain risk (Hachicha and Elmsalmi, 2014: 1308). The escalating complexity of supply chains corresponds with an increase in uncertainty and risk (Sofyalioğlu and Kartal, 2012: 1450). Supply chain risk, defined as the potential for a negative and unforeseen event directly or indirectly leading to supply chain interruption, underscores the importance of effective risk management (Garvey et al., 2015: 620). Unforeseen risks emanating from the supply chain can render it vulnerable. The ongoing impact of the recent pandemic has significantly disrupted supply chains across various sectors, particularly in the production sector (Haren and Simchi-Levi, 2020).

Previous studies indicate that distinct sectors should emphasize varied supply chain risk management strategies (Rajesh and Ravi, 2015; Tse et al., 2016). For instance, companies in the food industry will need to tailor their risk management practices differently compared to those in the fashion industry, as both face different types and levels of environmental dynamism. Specifically, firms operating in industries characterized by uncertainty and resource scarcity encounter different risks than those in more stable and resource-rich sectors. Consequently, the nature of risks and the practices for their

management will significantly differ (Beske et al., 2014; Darby et al., 2020).

However, existing empirical evidence exploring suitable supply chain risk management strategies at the industry level falls short in providing adequate data explaining why certain risk management strategies prove effective in one industry sector but not in another. The global disruption caused by the COVID-19 pandemic serves as a pertinent example of how supply chain risk exposure and severity vary across industry types (Srivastava and Rogers, 2021: 2). COVID-19 has triggered a ripple effect across supply chains in various industries, placing them under unprecedented pressure. The imposition of quarantine measures worldwide has led to significant restrictions on the free movement of goods, creating a situation unlike any other in the past. In certain industries, lockdowns resulted in the suspension of raw material movements, causing substantial challenges for companies, suppliers, and logistics departments. The combination of decreased supply and relatively unchanged demand has led to significant price increases. Today's supply chains, characterized by their size, dynamic nature, complexity, and the escalating demands and expectations of customers, are increasingly susceptible to disruptions (Son and

Orchard, 2013). Surprisingly, research indicates that only 10% of companies have comprehensive plans in place to mitigate potential disruptions in their supply chains (Black and Ray, 2011).

Dowdall contends that the defense industry supply chain has received less research attention compared to other supply chains, primarily due to the complexity of products, challenges in accessing data, and the intricacies of economic networks. The defense industry encompasses a diverse and dynamic array of companies, including both private entities and organic Department of Defense (DoD) facilities. These entities provide products and services directly or indirectly to the DoD and national security agencies in support of national security objectives. The defense sector, as a cornerstone of national security, experiences rapid changes in the supply chain ecosystem.

An additional factor that sets defense supply chains apart is their foundation on long-term cooperation. Given that the production of a defense system spans 5-10 years with an average lifespan of 50-60 years, businesses at each link in the supply chain of a defense system become part of a partnership that can endure for many years. The supply chain plays a pivotal role in the success of any defense organization. Effective and efficient supply chains empower

these organizations to attain their strategic and financial objectives. Managing supply chain risks and adapting to emerging trends such as digital advancement and sustainability will be crucial for a sustainable future in the defense industry (E&Y, 2021).

In a risk analysis by E&Y on the world's 15 largest defense industry companies, supply chain-related risks ranked second among the ten most significant risks. Defense industry companies rely on numerous suppliers or subcontractors for raw materials, semi-finished products, or spare parts. The ability to meet quality standards, product specifications, and delivery times hinges on their relationships with these suppliers. Consequently, the supply chain emerges as the key to success for every institution, and achieving targets on time relies on the effective management of this network (E&Y, 2017).

In summary, the proliferation of global supply networks, coupled with current research findings, underscores the imperative to develop resilient supply chains capable of responding to disruptions and swiftly restoring supply chain operations to their original or improved state (Chang et al., 2015: 648).

2. RESEARCH AND FINDINGS

2.1. Possible Risks and Effects in Defense Supply Chains

Given the paramount importance of supply chain effectiveness in creating a competitive advantage, the shift in competition has transitioned from inter-organizational to inter-supply chain competition (Cabral et al., 2012: 4835). Effective supply chain management has evolved into a critical factor for organizational survival, becoming an integral component of any business. Proficient supply chain management has the potential to enhance customer service, reduce operating costs, improve product quality, and accelerate delivery and innovation (Li et al., 2006: 110). Consequently, supply chain-related risks are imperative to be effectively managed by organizations.

While increased globalization of defense supply chains may offer cost benefits, it simultaneously introduces complexity, compounded by the numerous relationships within these chains and their intricate, interdependent layered nature. For instance, an engine manufacturer, a crucial member of the overall production supply chain in the defense industry, relies on its own supply chain for engine production. The existence of multiple layers of supply chains within the system

complicates both the complexity and manageability of the entire network (E&Y, 2021).

In their study compiling supply chain risks specific to various industries, Srivastava and Rogers encompass risks in sectors such as automotive, construction, electronics, fashion, food, pharmaceuticals, energy, mining, and aviation. Among these, aviation risks, which bear resemblance to the defense sector, include challenges such as global resource fluctuations, variable market conditions, product complexity, and a diverse supplier base. In the automotive industry, risks involve supplier failure, supplier quality problems, oil crises, terrorist attacks, strikes, IT system failures, increased customs duties, changes in customer demand, technological advancements, and rising raw material prices (Srivastava and Rogers, 2021: 5).

The US Department of Defense identifies ten risks threatening the defense industry in its report, encompassing issues like a single resource for required talent, fragile suppliers and markets, capacity-constrained supply markets, foreign dependencies, decreasing manufacturing resources, material scarcity, gaps in US-based manpower capital, erosion in defense infrastructure, and product security risks (DoD, 2018: 30-55). RAND Corp.'s 2015 research on supply

chain risks in the US Army and Air Forces highlights the three most significant risks as fluctuations in demand, uncertainties about financing, and extended delivery times due to administrative or production reasons (RAND, 2015: 14).

A 2018 study by E&Y identifies key risks including dependency on a single source, long delivery times, financial difficulties, inventory density, collaboration management throughout the supply chain, and cyber threats (E&Y, 2018: 5). Pre- and post-COVID-19 studies on supply chains exhibit notable differences. While epidemic or disaster risks were considered among the top ten supply chain risks in studies conducted before COVID-19, they took precedence in studies conducted afterward. The disruptions caused by the epidemic exceeded calculated possibilities. A supply chain risks report presented to the US Senate emphasizes that the supply chain weakened by COVID-19 poses a threat to US national security. Excessive reliance on China in critical supply chains, particularly in the defense sector, presents significant strategic and competitive risks for the USA, allowing China to potentially impede the export of these products (HASC, 2021). Research conducted in England identifies six primary risks associated with defense industry supply chains. These include

challenges faced by Small and Medium-sized Enterprises (SMEs) and mid-level suppliers in accessing main contractors and the Ministry of Defense, a lack of innovation due to difficulties attracting non-traditional suppliers to the sector, hindrances posed by the durations and conditions of defense contracts on supply chain development, shortcomings in the critical defense industry workforce, and the industry's slower adoption of new production technologies compared to other sectors, coupled with its vulnerability to cyber threats (RAND, 2021).

Moreover, the impact of the Covid-19 pandemic has been felt in the UK, as in other countries. Defense supply chains encountered urgent difficulties in timely program delivery due to production delays and delayed payments to defense suppliers, resulting from disruptions caused by the pandemic (Lye, 2020). In light of the aforementioned considerations, risks pertaining to defense industry supply chains can be categorized under supplier-related risks, risks arising from globalization and foreign dependency, sector-specific risks, and cyber security risks.

2.1.1. Risks originating from suppliers

One of the most prevalent supplier-related risks is dependence on a single source, characterized by

non-competitive procurement negotiations with only one supplier. In an era of budget constraints and governments aiming to maximize efficiency with reduced spending, full and open competition is crucial for obtaining the best value for money. However, studies indicate a weakness in the defense sector regarding competitive procurement (Pyman et al., 2009: 216).

The risk associated with a single source extends both nationally and globally. As exemplified by the F-35 case, its global dimension is closely tied to international relations. This risk arises when a single company has the capacity to fulfill the required system/material/service requirements, and it stands out as one of the most common risks in the defense industry. The prevalence of single sourcing in various defense sectors exposes the industry to global and local supply shortages, diminishing readiness. The specialized nature of the industry, particularly in the aviation sector, impedes competition, hindering potential market entrants from benefiting from economies of scale enjoyed by established dominant vendors (Gonzalez and Rodriguez, 2021).

Relying on a dependable single-source supplier offers advantages such as ensuring quality, minimizing disruption risks, leveraging the brand value of a reputable supplier, building

trust, and optimizing costs. However, any delay or quality issue at the sole-source supplier's end poses a heightened risk of production stoppage, delivery delays, and cost overruns (E&Y, 2018: 3). Being dependent on a single source in the defense industry also undermines risk management strategies, such as redundancy or diversification of the supplier base, which are among the most crucial approaches in supply chain management (Norris et al., 2020: 66).

Another supplier-related risk involves the use of unreliable imitations or poor-quality products, often sourced from subcontractors. Quality issues can even arise in globally monitored projects such as the F-35. For instance, out of over 10,000 critical manufacturing processes by airframe contractors, only 3,000 met predefined design standards on the F-35 project. Furthermore, the more than 500 aircraft in the field do not meet the program's reliability and maintainability goals. Although contractors are modifying production processes to address issues and enhance efficiency, there is acknowledgment that more needs to be done (GAO, 2020).

Counterfeit products are currently a major problem threatening the defense industry, with research indicating a significant portion originating from China. A study in

the USA in 2011, focusing on one million spare parts, revealed that 70% of them were traced back to China (Menz, 2018: 8). Recognizing this danger, Apple, as one of the companies vigilant against counterfeit products, has established a closed ecosystem to mitigate issues in the supply chain, especially those related to quality and faulty parts. Apple manages this closed ecosystem as an integrated process, intertwining all components, including production, purchasing, logistics, and suppliers. The company inspects the production lines of all its suppliers, emphasizing a holistic approach to supply chain management rather than treating it as an isolated application under the authority of a single department (Satariano, 2013). For the defense industry, imitation or counterfeit products not only pose significant security risks but also entail serious economic burdens for companies or the state. According to a 2012 report in the USA, the Missile Defense Agency and its contractors had to invest \$4.5 million in reprocessing costs due to counterfeit products (Watson, 2015).

The defense industry grapples with fluctuating demand, at times leading to capacity risks. Many systems, especially those with a limited number of critical part manufacturers, face the potential of production interruptions due to these fluctuations. Increasing capacities

necessitates additional investment, and the associated risks of fluctuating or interrupted demand post-investment also elevate the risk of return on investment (E&Y, 2018: 13). The combination of high production costs and the consolidation of the defense industry compels countries to increasingly prioritize readily available solutions in the international market rather than developing their own military equipment (Kluth, 2017: 160). However, imported technology must be adapted to align with the importing country's specific defense doctrines, infrastructures, and requirements.

For nations aspiring to maintain a domestic defense industry and critical technologies, two fundamental approaches address fluctuations in demand: dual production and export. Escalating defense system costs drive governments toward dependence on civilian or dual-use technologies and innovations within the defense industry (James, 2009: 450). Upon achieving the required number of systems, the production line should either be sustained with export connections or diversified by producing for needs outside the defense sector through dual production. Failure to effectively manage demand fluctuations may not only jeopardize individual businesses

but also impact all entities within the supply chain.

The defense industry, by its nature, necessitates the employment of a skilled and engineer-oriented workforce, along with qualified management personnel responsible for recruiting and overseeing them. This is due to the defense industry's involvement in complex production and system integration activities. Failure to attract and employ talented personnel, or the loss of existing personnel over time, can result in both cost and time losses and quality problems (Ernst & Young, 2018: 15). In the United States, a survey conducted in December 2017 of 662 manufacturing companies by the National Association of Manufacturers revealed that the primary business challenge, identified by 72.9% of respondents, was the inability to attract and retain a quality workforce. In response to this workforce challenge, 66% of respondents stated that they increased the workload of their current employees, while 34.4% mentioned that their companies were unable to secure new business opportunities and lost revenue due to challenges in attracting and retaining workers (Department of Defense, 2018: 50).

2.1.2. Risks resulting from globalization and foreign dependency

Similar to all sectors, the defense industry relies on various raw materials, intermediate products, and finished goods. These items can traverse international borders. However, unlike other sectors, such transactions in the defense industry can be significantly influenced by political fluctuations and international relations. For instance, diplomatic tensions between Japan and China in 2010 resulted in a de facto export ban on certain rare items to Japan. This raised concerns in Japan, which has limited natural resources and has long been apprehensive about import dependence (Bradsher, 2010). This situation prompted accusations against the Japanese government for inadequate investment in risk management (Inoue, 2010).

Another example occurred in the dispute between Turkey and the USA over the F-35 program. Following the US President's directive to exclude Turkey from the program, more than 900 parts of the F-35 were being produced in Turkey, with most in a single-source position (Clark, 2021). The decision to remove Turkey was estimated to cost 1 billion dollars, posing a significant risk for decision-makers. Despite political fluctuations, it was ultimately decided to continue purchasing these

spare parts from Turkey until 2022 (Sisk, 2020). However, the investments made by businesses in the supply chains of this multi-decade project in Turkey could pose a substantial risk post-2022.

The Covid-19 pandemic serves as a noteworthy example, revealing the risks foreign dependency may pose for the defense sector. During this period, some countries, similar to other sectors, experienced complete shutdowns in the defense industry, hindering the production of products required by other nations in the defense sector (Gould, 2020). Delays in the defense supply chain serve as a reminder to policymakers that offshore or foreign-dependent supply chains entail risks that may be unacceptable in the defense context (Clark, 2021). For instance, the United States relies entirely on imports for 19 minerals, and any disruption in the supply of these minerals could halt the production of defense systems such as radar and guided missiles (Humphries, 2015: 26). Seventeen of these minerals are sourced from China and find applications in other sectors of the economy, including high technology and clean energy (Symth, 2020). China, in turn, has the potential to blacklist companies or countries it deems harmful to its interests or connected to parties it perceives as harmful, particularly in the realm of rare earths (Gill and Pollard, 2020).

Similarly, the reliance on Japan and Europe as the only foreign sources of carbon fibers poses significant risks for the USA. Disruptions in the supply of carbon fibers could potentially impact the Ministry of Defense's missile, satellite, space launch, and other defense production programs. Often, there are no readily available substitutes for these materials, and establishing a new carbon fiber factory is both expensive and time-consuming. The uncertainty and substantial resource requirements for qualified replacement suppliers further compound this concern (Department of Defense, 2018: 49).

A critical issue regarding foreign dependency in defense supply chains is the need to balance cost-effective flow in peacetime with readiness and alternatives to ensure supply chain continuity during wartime. In peacetime, defense supply chains must meet usability and readiness requirements, while wartime demands focus on sustainability (Ekström et al., 2020: 186). According to Basnet and Seuring (2016), demand variability or uncertainty, product variety, desired customer delivery time, and supply uncertainty represent the fundamental conditions in supply chains, and these conditions will vary based on their state, whether it's peace, mobilization, or war. Transitioning from a state of peace to

a state of war, demand variability/uncertainty will shift from low to high, where desired delivery time and cost become more crucial, and, conversely, supply uncertainty/risk will increase during wartime. These defense-specific challenges need to be considered when formulating strategies for defense supply chains. In times of peace, supply chains should be simple and efficient, while in times of war, they should be agile and effective (Basnet and Seuring, 2016).

2.1.3. Risks arising from the sector (sector-specific)

The safety and security systems, as well as the quality assurance standards necessary for defense systems, demand suppliers to possess expertise and demonstrate maturity in these aspects. National security requirements might constrain the selection of specific suppliers or necessitate the use of designated suppliers, thereby limiting manufacturers' options and extending their supply chains. In this highly regulated industry, the entry of new suppliers may require substantial investments, potentially restricting market entry and leading to anti-competitive scenarios (Ernst & Young, 2021).

Another sector-specific challenge is the struggle to attract adequate investment from other sectors, leaving the field predominantly in the

hands of traditional players and, consequently, constraining opportunities for innovation. For instance, a study on the defense industry in the UK indicates that defense procurement contracts and main contractor agreements involve slow, inflexible, and bureaucratic processes, adversely impacting contractors seeking entry into the sector. Non-traditional suppliers aiming to penetrate the defense market may need to make substantial investments, enhance the security standards of their products, invest in infrastructure security capacities, and restructure their processes. However, the return on these investments may not always justify the associated costs (RAND, 2021: 5).

Beyond sustainability concerns, the defense sector heavily relies on the commercial sector for technology advancement. However, the commercial sector, driven by revenue and high-volume technology demands, may not always prioritize the development of technology for military use (Department of Defense, 2018: 50).

2.1.4. Cybersecurity risks

The interconnectedness of computers through networks and the vast amount of information they contain have accelerated computing processes and brought the digital and physical worlds closer than ever before. While this approach enhances

efficiency, it also intensifies cyber threats. According to a study by the National Institute of Standards and Technology (NIST), 80% of all information breaches originate from the supply chain. Cyber supply chain risks encompass various threats, including the introduction of counterfeit products, unauthorized manufacturing, tampering, theft, insertion of malware and hardware, as well as substandard manufacturing and development practices in the cyber supply chain (NIST, 2020).

Moreover, recent reports indicate an escalating rate of attacks on supply chains. For instance, Symantec's research in 2019 revealed a 78% increase in supply chain attacks in 2018 (Davis, 2019). The concerning aspect of these attacks is their high success rate and the significant damage they inflict. A Ponemon Institute study in November 2018 found that 59% of organizations participating in the study experienced a data breach caused by one of their third parties (Ponemon and Opus, 2018). A survey by CrowdStrike in July 2018 further disclosed that 66% of respondents had encountered a software supply chain attack, with 90% of them experiencing financial impacts as a result, averaging over \$1.1 million in cost per attack (Larson, 2018).

Supply chains in the defense industry are frequently targeted in cyber attacks due to their high

priority and value as strategic assets for rival countries. As major companies enhance their cyber defenses, attack strategies have evolved from direct assaults on prime contractors to targeting other entities in the supply chain, including trusted vendors and subcontractors (Bluevoyant, 2021: 4). Notably, the Russian cyber attack group known as "Cozy Bear" successfully breached the data of over 18,000 organizations and clients through a cyber attack on the software company "Solarwinds," a subcontractor for numerous defense industry firms in the United States, exploiting its network monitoring platform "Orion" (Vavra and Starcks, 2020). A study by Bluevoyant focused on defense industry companies revealed intriguing findings. According to this research, the sector in which a company operates is more crucial than its size in determining the risk of cyber attacks, with the highest risk identified in Research and Development (R&D) companies. The size of the company, in conjunction with its field of activity, further amplifies this risk, indicating that small companies engaged in manufacturing and R&D are at significantly higher risk compared to counterparts in other size groups or sectors (Bluevoyant, 2021: 10). The defense supply chain, often containing state secrets, faces constant threats from external forces,

making its protection a national security priority (Norris et al., 2020).

Small and Medium-sized Enterprises (SMEs) form the backbone of the defense industry and bear significant responsibility. Operating on cash profits is crucial for sustaining operations and fostering growth. Given their emphasis on economic efficiency, SMEs can impact the broader supply chain's integrity if they either prioritize or neglect security measures (Verbano and Venturini, 2013). The alarming statistic that 99% of the 347,000 manufacturers in the USA are small and medium-sized, with 50% lacking fundamental cyber technology, raises concerns for national security, especially since most cyberattacks targeted these businesses in 2014 (DoD, 2018). Their limited financial and technical resources make them susceptible targets for cyber risks. Large-scale defense industry companies commonly engage in contracting and subcontracting. For instance, when Boeing produced the 747 aircraft in 2012, it comprised 6 million sub-parts sourced from over 550 suppliers in 30 countries (Boeing, 2013). Airbus, with 1,676 publicly disclosed suppliers, has over 12,000 "second-tier and below" suppliers, and General Motors has 856 "first-tier" suppliers along with more than 18,000 "second-tier and below" suppliers. This intricate, multi-

layered structure poses challenges in securing the supply chain, particularly as third- and fourth-tier suppliers tend to be smaller and more specialized. These suppliers might also outsource components or operations, introducing "fourth-party" suppliers, further complicating management (Sen, 2019). The complexity of the supply chain with its sub-layers makes tracking sources of risks and vulnerabilities increasingly challenging (Norris et al., 2020: 73). Regardless of how effectively main contractors safeguard their data, the sensitivity remains if adequate precautions are not taken for subcontractors. For example, the 2020 cyber attack on Visser Precision, a subcontractor for major companies such as Lockheed Martin, General Dynamics, Boeing, and SpaceX, exposed extensive data, leading to virtual blackmail threats of further disclosures (Gresik, 2020).

3. DEFENSE SUPPLY CHAIN RISK MANAGEMENT STRATEGIES

The supply chain encompasses all activities performed by manufacturers and distributors to generate value, including purchasing, production, and distribution. Supply chain risk management involves identifying and managing risks across the supply chain to enhance overall resilience and responsiveness

through a coordinated effort among supply chain members (Norris et al., 2020: 69). The U.S. Department of Defense defines Supply Chain Risk Management as "a systematic process used to manage supply chain risk by identifying vulnerabilities, threats, and risks throughout the supply chain and developing mitigation strategies to address these threats posed by the supplier, product, and its subcomponents, or the supply chain" (DoD, 2012).

Supply chain management strategy is how a company enhances its performance through competitive priorities such as quality, flexibility, innovation, speed, time, and reliability (Chen and Paulraj, 2004). These priorities usually encompass cost, quality, flexibility, innovation, speed, time, and reliability, with the overarching goal of ensuring a competitive advantage (Schnetzler et al., 2007). While various supply chain strategies have been suggested by researchers, approaches other than "lean and agile" and "efficient and responsive," which are often used interchangeably, are considered overly simplistic (Basnet and Seuring, 2016).

Lean strategy: Aims to eliminate all waste, including time (Naylor et al., 1999).

Agile strategy: Focuses on responding quickly to unpredictable changes in demand or supply (Christopher and Peck, 2004).

Efficient strategy: Concentrates on reducing unit costs by minimizing long production times and high setup costs (Randall et al., 2003).

Companies that prioritize low cost, high quality, and/or short delivery time typically opt for a lean strategy, whereas those emphasizing flexibility may find an agile strategy more suitable (Qi et al., 2017). Supply chain strategy acts as a response to external and unforeseen factors like demand variability/uncertainty, product variety, desired customer delivery time, and supply uncertainty/risk (Basnet and Seuring, 2016). The primary variables guiding the choice of a supply chain strategy are risks and uncertainties. Supply chain risk management strategies can be broadly classified into two categories: redundancy and flexibility. The redundancy approach involves keeping some resources in reserve to be utilized in case of a disruption. Common examples of this approach include maintaining strategic inventory, having safety stock, engaging multiple suppliers, and adding capacity (Sheffi and Rice, 2005).

In contrast, the resilience strategy is founded on the principle of developing organizational and inter-organizational capabilities to swiftly detect and respond to threats to supply continuity (Zsidisin and Wagner, 2010: 3). Strategies that

promote collaboration, integration, information sharing (communication), and increased responsiveness are examples of flexible risk management strategies. Looking at it from the defense industry perspective, distinct strategies may be required to manage supply chain risks. The primary reason for this is the prominence of national security and sustainability concerns in defense supply chains. Strategies prioritizing national security and the sustainability of the production line are essential. Examples of risk management strategies include risk and return-sharing partnerships, the adoption of new digital technologies, vertical integration, monitoring subcontractors' security systems (stipulating this in contract negotiations), shared supply chains on common platforms, creating an alternative supplier network through multi-sourcing, and involving local players in the global supply network (E&Y, 2018). Strategy choices can significantly enhance the likelihood of achieving corporate goals if they are grounded in the institutionally implemented risk management process. Studies examining the impact of Enterprise Risk Management on corporate performance support this approach (Florio and Leoni, 2016: 56).

Managing defense supply chain risks is of vital importance for

national security, and failure to manage these risks may lead to irreparable consequences. Therefore, the initial step for the defense supply chain involves risk analysis. Risk analysis assists organizations in identifying potential vulnerabilities and assessing how these vulnerabilities may impact the organization and its systems (Sobb et al., 2020: 1863). To identify vulnerabilities and high-risk areas in the supply chain, data must first be collected. Three fundamental factors should always be considered when collecting data: 1. the relative importance of the product in terms of national security; 2. the health of the sectors and organizations producing the product (including whether the material is produced at the required capacity/rate and whether the supplier is the sole/primary source); and 3. where the product is manufactured—whether domestically, in an allied or friendly country abroad, or in a competitor or potential competitor country abroad. This approach allows decision-makers to take more informed steps when making decisions regarding the supply chain (Clark, 2021). After collecting the data, the sensitivity or criticality of the products and their impact on the supply chain should be examined, and the probability of the risk occurring should be evaluated. Methods for identifying risks include brainstorming, interviews,

workshops, supply chain mapping (Gardner and Cooper, 2003), the Delphi Method (Linstone and Turoff, 2002), Fault or Event Tree Analysis (Ziegenbein and Nienhaus, 2004), and the Nominal Group Technique (Zsidisin et al., 2000). Vulnerabilities are features likely to disrupt a specific product or service, evaluated at both macro and micro levels. At the micro level, the financial performance of the enterprise and its process structure within the public and private sectors are assessed. At the macro level, the evaluation extends to the market, considering factors like the number of companies in a sector and the level of dependence on foreign suppliers. Criticality pertains to features that make changing a product or service challenging and is assessed concerning the difficulty of recovering from a disruption in a specific sector. Six measures determine criticality: Facility and equipment requirements, Skilled workforce requirements, Defense design requirements, Defense uniqueness, Regeneration time, and Availability of alternatives (DoD, 2014). When assessing risks based on impact and probability, an essential factor is the degree of importance for national security. While many defense sector products are vital for national security, some hold more significance than others. For instance, the spare part of the F-35

aircraft is more critical than a soldier's boot in terms of national security (Clark, 2021).

Following risk assessments, results such as high probability-high impact, high probability-low impact, low probability-high impact, or low probability-low impact are obtained. Some authors (Steele and Court, 1996) assign a relative weight to the probability of occurrence, while others (Ziegenbein and Nienhaus, 2004) categorize the probability as unlikely, possible, probable, or very likely. The impact of a risk is influenced by its scale, scope, duration, recovery time, and total cost. Total impact can be ranked as low or high (Steele and Court, 1996) or low, moderate, significant, or fatal (Ziegenbein and Nienhaus, 2004). Risks are prioritized based on their importance to the organization to eliminate and reduce risks, focusing resources on the most critical ones. The main determinant of how risks are managed is the institution's risk appetite. Institutions with high risk appetite may choose not to manage low-probability risks, even if their impact is high, whereas risk-averse institutions may manage all risks. For example, they might maintain excessive stock to manage disruptions in the supply chain. The redundancy strategy's primary motivation is risk aversion and ensuring supply chain reliability. The global proliferation of supply chains

increases vulnerability to high severity/low probability risks (Sheffi and Rice, 2005). The ongoing Covid-19 epidemic, initially considered a low-probability, high-impact risk, significantly affected all supply chains, including those in the defense industry. Businesses employing Just-in-Time (JIT) production or relying on single resources for high efficiency are more susceptible to high-impact, low-probability risks and experience greater impact when such risks occur (Black and Ray, 2011: 17). Therefore, strategies focused on maintaining redundancy rather than flexibility for managing high-probability, low-impact risks can be more effective (Chang et al., 2015: 648). However, redundancy strategies are closely tied to available resources. As an example, the Defense Logistics Agency (DLA) in the US has maintained a stock of \$1.152 billion in 37 types of elements called "Rare Elements" since 1989 to minimize the impact of unforeseen risks in defense supply chains (Dyatkin, 2020). High probability and low impact risks are those encountered regularly in daily activities but have minimal impact. Such risks are relatively predictable, and resilience strategies, supported by collaboration and information exchange among supply chain members, can effectively manage them (Wieland and Wallenburg, 2013). High impact, high probability

risks represent frequent occurrences with severe impacts on ongoing business performance, like the loss or failure of a key supplier, labor unrest, unexpected product quality issues, and product recalls. Organizations should prioritize managing and preventing such high severity/high probability risks due to their significant consequences. It may be necessary to employ both redundancy and flexibility strategies concurrently in managing these risks. While the redundancy strategy aims to mitigate short-term, potentially devastating consequences by buying time to address these risks, the communication and collaboration associated with the resilience strategy reduce the likelihood of ongoing significant damage by improving the bounce-back capabilities of supply chain participants (Chang et al., 2015: 649).

When allocating resources after conducting risk analysis, defense industry companies should evaluate the effects and possibilities of risks, prioritize them, and determine strategies appropriate to the type of risk. While flexibility is necessary to manage some risks, redundancy strategies are essential for others. It is nearly impossible or extremely expensive and time-consuming to eliminate all risks in the supply chain. Instead of complete elimination, the impact of risks can be reduced by implementing countermeasures or

mitigation measures throughout the life cycle of the part or system. There are four basic ways to respond to identified risks: using protective measures (countermeasures and mitigations) to reduce the likelihood or consequence of a threat exploiting a vulnerability, transferring some or all of the risk mitigation responsibility to another organization and/or life cycle stage, making a conscious decision to continue the activity (or acquisition) despite possible consequences, or eliminating the possibility of a threat, susceptibility to a vulnerability, or the impact of exploitation by not continuing the activity or acquisition (Ferry and Poindexter, 2016: 21). If the probability, consequence, or duration of a risk cannot be reduced, the institution must determine forward-looking operational, risk-sharing, or transfer measures to mitigate it (Ziegenbein and Nienhaus, 2004).

Responding to risk can range from doing nothing to redesigning a system to avoid using a component that lacks acceptable risk mitigation options. Risk mitigation demands significant effort and has a substantial impact on cost and time. For instance, evaluating the security and privacy practices of all third parties and tracking the points where they share data are risk management techniques requiring substantial effort (Ponemon and Opus, 2018). However,

significant costs may be necessary to implement these measures. Choosing an option that requires less effort might save upfront costs but often results in higher costs later in the system's life cycle. Vulnerabilities detected early in a system's design can often be significantly reduced or eliminated at relatively low cost with simple design changes or purchasing restrictions (Ferry and Poindexter, 2016: 22). Emerging technologies and new applications can also be employed to manage supply chain risks. For example, although current applications of Blockchain for supply chain management are limited in scale, this technology can securely store and organize data, making it easily updatable and reducing costs, addressing the obsolescence problem. However, a blockchain application in defense would likely require a centralized network of computers, rather than the decentralized network of servers used in the case of Bitcoin. Similarly, Artificial Intelligence (AI) applications can also be utilized. AI can be employed to detect supply chain weaknesses by scanning data or processing country-of-origin data for components to determine whether these components meet local supply requirements (Clark, 2021).

4. CONCLUSION

Managing supply chain risks in alignment with physical, human, and organizational resources, along with industry dynamics, is a crucial capability for corporate competition and sustainability. Institutions' inability to effectively respond to supply chain risks can lead to disruptions in their operations, a concern highlighted during the supply chain challenges observed in the Covid-19 pandemic. The strength of supply chains relies on the resilience of each link, emphasizing that chain size increases sensitivity. Unforeseen risks within the supply chain can render it vulnerable. Research indicates that supply chain risks may vary across sectors. Therefore, the risk management process for the defense industry supply chain, a fundamental pillar of national security, must cater to the unique needs of the sector. However, defense industry supply chains have received less research attention compared to other supply chains due to product complexity, data accessibility challenges, and intricate economic networks.

The defense industry supply chain, built on long-term collaborations, is among the sectors experiencing rapid changes in the ecosystem. Effectively managing supply risk by adapting to emerging trends like digital advancement and sustainability will

be pivotal for a sustainable future in the defense industry. While greater globalization in defense supply chains can offer cost benefits, it also introduces complexity, especially when businesses within the chain have separate sub-chains, complicating relationship management. A supply chain weakened by the Covid-19 pandemic is recognized as a threat to US national security, as highlighted in a supply risks report prepared for presentation to the US Senate. In summary, risks related to supply chains in the defense industry encompass supplier-related risks, risks arising from globalization and foreign dependency, sector-specific risks, and cyber security risks.

Sole-source procurement is an approach that, in many defense industry supply chains, is a necessity rather than a conscious choice, representing one of the most common risks in the defense sector. The widespread adoption of single sourcing in various defense industry areas makes the sector susceptible to global and local supply shortages, ultimately reducing readiness. Another supplier-related risk involves the use of unreliable, imitation, or poor-quality products from subcontractors, posing a significant threat to life in defense systems.

Similar to other sectors, the defense industry relies on numerous

raw materials, intermediate products, and goods, with the added complexity that these items can change hands between different countries. However, political fluctuations can disproportionately impact defense supply chains, leading to severe consequences. The Covid-19 pandemic vividly demonstrated the risks associated with foreign dependency in the defense sector, unveiling vulnerabilities during disruptions. Defense supply chains must meet availability and readiness requirements in times of peace and shift to sustainability requirements during combat. Another challenge for the defense sector is the substantial investment costs imposed on businesses operating in this field due to the stringent safety and security systems, quality assurance standards, and heavily regulated processes required for defense systems.

The sectors struggle to attract sufficient investment often results in continued reliance on traditional suppliers, limiting innovation opportunities. Today, cybersecurity threats, encompassing counterfeit products, unauthorized production, tampering, theft, malware and hardware insertion, as well as subpar production and development practices in the cyber supply chain, have emerged as the foremost risks in defense supply chains. The high success rate of cyber attacks, coupled

with the significant damage they cause, underscores the criticality of addressing this issue. Particularly, small and medium-sized enterprises (SMEs) in the sector, lacking the resources for robust cybersecurity measures, become prime targets for cyber hackers.

Managing supply risks requires an effective and comprehensive corporate risk management process. The supply chain strategy acts as a response to external and unexpected factors such as demand variability/uncertainty, product variety, desired customer lead time, and supply uncertainty/risk. While lean and agile strategies, or redundancy and flexibility strategies, are commonly used in supply chain management, the main determinants for choosing a strategy are the risks and uncertainties that guide the selection of the supply chain strategy.

What sets defense supply chains apart is the heightened focus on national security and sustainability concerns. Strategies prioritizing national security and production line sustainability become imperative. However, these strategic choices can only enhance the likelihood of achieving corporate goals if they are rooted in a robust corporate risk management process. The initial step for defense supply chains involves risk analysis. The examination of product sensitivity or criticality within the chain, along with its

impact on the supply chain, should be closely assessed, and the probability of the risk occurring must be evaluated.

The impact and probability resulting from risk assessments determine the significance of the risk and become the primary factor influencing decisions on managing the institution within the established risk appetite or allocating resources. The expanding scope of global supply chains exposes companies to increasing vulnerability to high severity/low probability risks. In the management of high probability and low impact risks, strategies emphasizing redundancy take precedence, whereas flexibility strategies prove more effective for high probability and low impact risks—risks encountered in daily activities that lack a significant impact.

High probability and high impact risks necessitate comprehensive management by the institution and may require the simultaneous use of both flexibility and redundancy strategies. The notion of eliminating all risks in the supply chain is practically unattainable and can be excessively costly and time-consuming. Instead of total elimination, reducing the impact of risks through countermeasures or mitigation measures throughout the part or system's life cycle offers a more practical approach.

Responding to risk encompasses a broad spectrum of activities, ranging from taking no action to utilizing all available resources. This involves a trade-off, as significant costs may need to be incurred to eliminate substantial risks. Conducting risk analyses from the outset, especially during the design or installation phase of the supply chain, plays a crucial role in averting larger risks that might surface over time. Therefore, risk management in defense supply chains should consistently be an integral part of the process.

REFERENCES

- [1] Alicke, K., Davies, A., Leopoldseder, M. and Niemeyer, A., (2017), *Blockchain Technology for Supply Chains—A Must or a Maybe?* McKinsey & Company, September 12, retrieved in 25.10.2021 from: <https://www.mckinsey.com/business-functions/operations/our-insights/blockchain-technology-for-supply-chains-a-must-or-a-maybe>
- [2] Barney, J., (1991), "Firm Resources and Sustained Competitive Advantage", *Journal of Management*, 17 (1): pp. 99–120.
- [3] Basnet, C. and Seuring, S. (2016), "Demand-oriented Supply Chain Strategies – a Review of the Literature", *Operations and Supply Chain Management: An International Journal*, Vol. 9 No. 2, ss 73-89, doi: 10.31387/oscm0240162.
- [4] Beske, P., Land, A. and Seuring, S., (2014), "Sustainable Supply Chain Management Practices and Dynamic Capabilities in the Food Industry: A Critical Analysis of the Literature. *International Journal of Production Economics*, 152: pp.131–143.

- [5] Bluevoyant, (2021), "Defense Industry Supply Chain & Security 2021", Bluevoyant Review,
- [6] Boeing, (2013), "Boeing Celebrates Delivery of 50th 747-8", retrieved in 16.11.2021 from <https://boeing.mediaroom.com/2013-05-29-Boeing-Celebrates-Delivery-of-50th-747-8>
- [7] Bradsher, K., (2010), "Amid Tension, China Blocks Vital Exports to Japan", The New York Times, September 22, retrieved in 25.10.2021 from <https://www.nytimes.com/2010/09/23/business/global/23rare.html>
- [8] Cabral, I., Grilo, A. and Cruz-Machado, V., (2012) "A Decision-Making Model for Lean, Agile, Resilient and Green Supply Chain Management", International Journal of Production Research Vol. 50 No. 17, pp. 4830-4845.
- [9] Chang, W., Ellinger, A.E., Blackhurst, J., (2015), "A Contextual Approach to Supply Chain Risk Mitigation", The International Journal of Logistics Management, Vol. 26 No. 3, pp. 642-656. <https://doi.org/10.1108/IJLM-02-2014-0026>.
- [10] Chen, I.J. and Paulraj, A., (2004), "Towards a Theory of Supply Chain Management: the Constructs and Measurements", Journal of Operations Management, Vol. 22 No. 2, pp.119-150.
- [11] Chipeta, C. (2021) "What Is Fourth Party Risk?," UpGuard, November 19, 2021, retrieved in 26.10.2021 from <https://www.upguard.com/blog/>
- [12] Christopher, M. And Peck, H., (2004) "Building the resilient supply chain", The International Journal of Logistics Management, Vol. 15 No. 2, pp. 1-14.
- [13] Clark, M., (2021), "Understanding and Protecting Vital U.S. Defense Supply Chains. Backgrounder No. 3598" | April 1, Center For National Defense.
- [14] Darby, J.L., Ketchen, D.J Jr., Williams, B.D. and Tokar, T., (2020), "The Implications of Firm-Specific Policy Risk, Policy Uncertainty, and Industry Factors for Inventory: A Resource Dependence Perspective". Journal of Supply Chain Management XX (XX): 1–22.
- [15] Davis, D.B., (2019), "ISTR 2019: Cyber Criminals Ramp Up Attacks on Trusted Software and Supply Chains". Symantec Expertise Block, retrieved in 11.10.2021 from <https://symantec-enterprise-blogs.security.com/blogs/expert-perspectives/istr-2019-cyber-criminals-ramp-attacks-trusted-software-and-supply-chains>
- [16] DoD, (2012), Instruction (DoDI) 5200.44, Supply Chain Risk Management (SCRM),
- [17] DoD, (2016), "U.S. Department of Defense, Annual Industrial Capabilities" Report to Congress for 2014, September p. 8, retrieved in 25.10.2021 from: <https://www.businessdefense.gov/Portals/51/Documents/Resources/2014%20AIC%20RTC%2010-03-16%20-%20Public%20Unclassified.pdf?ver=2017-04-18-072624-770>
- [18] DoD, (2018), Assessing and Strengthening the Manufacturing and Defense Industrial Base and Supply Chain Resiliency of the United States, Report to President Donald J. Trump by the Interagency Task Force in Fulfillment of Executive Order 13806.
- [19] Dowdall, P., (2004), "Chains, Networks and Shifting Paradigms: The UK Defence Industry Supply System". Def. Peace Econ15, pp.535–550.
- [20] Dyatkin, B., (2020), "COVID-19 Pandemic Highlights Need for US Policies that Increase Supply Chain Resilience". MRS Bulletin, Volume 45, October.
- [21] Ekström, T., Hilletoft, P. and Skoglund, P., (2020), "Differentiation Strategies for Defence Supply Chain Design", Journal of Defense Analytics and Logistics, Vol. 4 No. 2, pp. 183-202. <https://doi.org/10.1108/JDAL-06-2020-0011>.

- [22] E&Y, (2017), “Top 10 Risks in Aerospace and Defence (A&D)” retrieved in 25.10.2021 from https://www.ey.com/en_gr/aerospace-defense/the-top-10-risks-in-aerospace-and-defense
- [23] E&Y, (2018), “A&D Edge Supply Chain Management in Aerospace and Defense” February 2018.
- [24] E&Y, (2021), “How to reshape aerospace and defence supply chains for resilience” retrieved in 20.10.2021 from https://www.ey.com/en_uk/aerospace-defense/how-to-reshape-aerospace-and-defence-supply-chains-for-resilience
- [25] Ferry H., and Poindexter, (2016), “Supply Chain Risk Management, An Introduction to Credible Threat”, Defense AT&L: July-August 2016
- [26] Florio, C. and Leon, G., (2017), “Enterprise Risk Management and Firm Performance: The Italian Case”, The British Accounting Review, Volume 49, Issue 1, pp. 56-74.
- [27] Friesen, G., (2021), “No End In Sight For The COVID-Led Global Supply Chain Disruption”, Forbes, 2021, retrieved in 10.10.2021, from <https://www.forbes.com/sites/garthfriesen/2021/09/03/no-end-in-sight-for-the-covid-led-global-supply-chain-disruption/?sh=37fef8053491>
- [28] GAO, (2020), “F-35 Joint Strike Fighter. Actions Needed to Address Manufacturing and Modernization Risks”. United States Government Accountability Office Report to Congressional Committees. GAO-20-339.
- [29] Gardner, J.T. and Cooper, M.C., (2003), “Strategic Supply Chain Mapping Approaches”, Journal of Business Logistics, Vol. 24, No. 2, pp. 37–64.
- [30] Garvey, M.D., Carnovale, S. and Yenyurt, S., (2015), “An Analytical Framework for Supply Network Risk Propagation: A Bayesian Network Approach”. European Journal of Operational Research 243:618–27.
- [31] Gellweiler, C. (2018), “Cohesion of RBV and Industry View for Competitive Positioning”. Strategic Management 23 (2): 3–12.
- [32] Gill, C. and Pollard, J.,(2020), “China Threatens Rare Earth Blacklist as Trade War Expands”, Asia Times Financial, October 12, retrieved in 25.10.2021 from <https://www.asiatimesfinancial.com/china-threatens-rare-earth-blacklist-a-trade-war-expands>
- [33] Gohs, I., (2021), “The Biggest Business Risks in 2021”, Visual Capitalist, retrieved in from 10.10.2021 <https://www.visualcapitalist.com/the-biggest-business-risks-around-the-world/>
- [34] Gonzalez, A. and Rodriguez, S. (2021), “Nothing left in the tank: The State of the Pentagon’s Supply Chain”. Defensenews. retrived in 20.10.2021 from: <https://www.defensenews.com/opinion/commentary/2021/06/28/nothing-left-in-the-tank-the-state-of-the-pentagons-supply-chain/>
- [35] Gould, J., (2020), “COVID Closed Mexican Factories That Supply U.S. Defense Industry. The Pentagon Wants Them Opened,” Defense News, April 21, retrieved in 25.10.2021, from: <https://www.defensenews.com/2020/04/21/covid-closed-mexican-factories-that-supply-us-defense-industry-the-pentagon-wants-them-opened/>
- [36] Gresik, D. (2020), “A Hacker Group Says it has Major Defense Companies’ Data”. Fifth Domein, 02 Mart 2020, retrieved in 05.11.2021 from <https://www.fifthdomain.com/2020/03/02/a-hacker-group-says-it-has-major-defense-companies-data/>
- [37] Gunasekaran, A., Papadopoulos, T. et al: (2017), “Big Data and Predictive Analytics for Supply Chain and Organizational Performance”. Journal of Business Research 70: 308–317.

- [38] Hachicha, W. and Elmsalmi, M. (2014) "An Integrated Approach Based-Structural Modeling For Risk Prioritization in Supply Network Management". *Journal of Risk Research* 17: 1301–24.
- [39] HASC, (2021) Report Of The Defense Critical Supply Chain Task Force. House Armed Services Committee July 22, 2021.
- [40] Haren, P. and Simchi-Levi, D., (2020), "How coronavirus could impact the global supply chain by midMarch", *Harvard Business Review*, Vol. 28., retrieved in 10.10.2021 from: <https://hbr.org/2020/02/how-coronavirus-could-impact-the-global-supply-chain-by-mid-march>
- [41] Humphries, M., (2015), "China's Mineral Industry and U.S. Access to Strategic and Critical Minerals" Issues for Congress.
- [42] Inoue, Y., (2010) "China Lifts Rare Earth Export Ban to Japan: Trader", *Reuters*, September 29, <https://www.reuters.com/article/us-japan-china-export-idUSTRE68S0BT20100929>.
- [43] James, A.D. (2009), "Reevaluating the Role of Military Research in Innovation Systems: Introduction to the Symposium." *J. Technol. Transfer*, 34, 449–454.
- [44] Kluth, M., (2017), "European Defence Industry Consolidation and Domestic Procurement Bias". *Def. Secur. Anal.*, 33, 158–173.
- [45] Larson, D., (2018), "Global Survey Reveals Supply Chain as a Rising and Critical New Threat Vector", *CrowdStrike Blog*, retrieved in 12.10.2021 from <https://www.crowdstrike.com/blog/global-survey-reveals-supply-chain-as-a-rising-and-critical-new-threat-vector/>
- [46] Li, S., Ragu-Nathan, B., Ragu-Nathan, T.S. and Rao, S.S., (2006), "The Impact of Supply Chain Management Practices on Competitive Advantage and Organizational Performance", *Omega*, Vol. 34 No. 2, pp. 107-124.
- [47] Linstone, H.A. and Turoff, M., (2002), *The Delphi Method: Techniques and Applications*, <http://www.is.njit.edu/pubs/delphibook/>
- [48] Lye, H., (2020), "Expect shrinking budgets and change of military focus: Globsec on Covid-19". *Army-technology.com*. retrieved in 25.10.2021 from, <https://www.army-technology.com/features/expect-shrinking-budgetsand-change-of-military-focus-globsec-on-covid-19/>
- [49] Menz, R., (2018) "Can We Defend The Defense Supply Chain? Lessons Learned From Industry Leaders In Supply Chain Management". *Naval Postgraduate School.Thesis Research*.
- [50] NIST, (2020), "Key Practices in Cyber Supply Chain Risk Management: Observations from Industry". *NISTIR 8276*, retrieved in 11.10.2021 from: <https://nvlpubs.nist.gov/nistpubs/ir/2021/NIST.IR.8276.pdf>
- [51] Norris, W., Rodgers, J.B., Blazek, C., Hewage, T. and Kobza, B., (2020), *A Market-Oriented Approach to Supply Chain Security. Security Challenges*, Vol. 16, No. 4, *Geo-Economics in the Indo-Pacific*, pp. 65-81
- [52] Ponemon, L., (2018), "Opus & Ponemon Institute Announce Results of 2018 Third-Party Data Risk Study: 59% of Companies Experienced a Third-Party Data Breach, Yet Only 16% Say They Effectively Mitigate Third-Party Risks", *Businesswire* November 15, retrieved in 11.10.2021 from <https://www.businesswire.com/news/home/20181115005665/en/Opus-Ponemon-Institute-Announce-Results-2018-Third-Party>
- [53] Porter, M., (1981), "The Contributions of Industrial Organization to Strategic Management". *Academy of Management Review* 6 (4): pp.609–620.
- [54] Pyman, M., Wilson, R. and Scott, D., (2009), "The Extent Of Single-sourcing In Defence Procurement And Its Relevance As

- A Corruption Risk: A First Look”, *Defence and Peace Economics*, Vol. 20(3), June, 215-232
- [55] Qi, Y., Huo, B., (2017), “The impact of Operations and Supply Chain Strategies on Integration and Performance”, *International Journal of Production Economics*, Vol. 185, pp. 162-174.
- [56] Rajagopal, R. And Ravi, V., (2015), “Modeling Enablers of Supply Chain Risk Mitigation in Electronic Supply Chains: a Grey-DEMATEL Approach”. *Computers & Industrial Engineering* 87: 126–139. doi:10.1016/j.cie.2015.04.028.
- [57] RAND, (2021), “Productivity challenges and UK defence supply chains”. RAND Europe Publications. Retrieved in 25.10.2021 from: <https://www.rand.org/randeuropa/research/projects/challenges-and-barriers-to-uk-defence-supply-chains.html>
- [58] Randall, T.R., Morgan, R.M., and Morton, A.R., (2003), “Efficient Versus Responsive Supply Chain Choice: an Empirical Examination of Influential Factors”, *Journal of Product Innovation Management*, Vol. 20 No. 6, pp.430-443.
- [59] Ray, S. and Black, T., (2011), “Downside of just-in-time inventory”, *Businessweek*, 24 March, pp.17-18.
- [60] Samvedi, A., Jain V. And Chan F. T.S., (2013), “Quantifying Risks in a Supply Chain Through Integration of Fuzzy AHP and Fuzzy TOPSIS”. *Int J Prod Res* 51(8): 2433–2442. <https://doi.org/10.1080/00207543.2012.741330>.
- [61] Satariano, A. (2013) “The iPhone’s Secret Flights from China to Your Local Apple Store,” *Bloomberg*, September 11, <https://www.bloomberg.com/news/2013-09-11/the-iphone-s-secretflights-from-china-to-your-local-apple-store.html>.
- [62] Schnetzler, M.J., Sennheiser, A. and Schonsleben, P., (2007), “A Decomposition-Based Approach for the Development of a Supply Chain Strategy”, *International Journal of Production Economics*, Vol. 105 No. 1, pp. 21-42.
- [63] Sheffi, Y. and Rice J.B. Jr., (2005), “A Supply Chain View of the Resilient Enterprise”, *MIT Sloan Management Review*, Vol. 47 No. 1, pp. 41-48.
- [64] Sisk, R., (2020), “US to Keep Buying F-35 Parts From Turkey, Despite Purchase Ban”. *Military.com*, retrieved in 25.10.2021 from: <https://www.military.com/daily-news/2020/10/01/us-keep-buying-f-35-parts-turkey-despite-purchase-ban.html>
- [65] Smyth, J., (2020), “Industry Needs a Rare Earths Supply Chain Outside China”, *Financial Times*, July 28, 2020, retrieved in 25.10.2021 from <https://www.ft.com/content/fc368da6-1c86-454b-91ed-cb2727507661>
- [66] Sofyalıoğlu, Ç. and Kartal, B., (2012), “The Selection of Global Supply Chain Risk Management Strategies by Using Fuzzy Analytical Hierarchy Process—A Case from Turkey”. *Procedia—Social and Behavioral Sciences* 58:1448–57.
- [67] Sobh, T., Turnbull, B. and Moustafa, N., (2020), “Supply Chain 4.0: A Survey of Cyber Security Challenges, Solutions and Future Directions”, *Electronics*; 9(11): 1864. <https://doi.org/10.3390/electronics9111864>
- [68] Son, J.Y. and Orchard, R.K.,(2013), “Effectiveness of policies for mitigating supply disruptions”, *International Journal of Physical Distribution & Logistics Management*, Vol. 43 No. 8, pp. 684-706.
- [69] Srivastava, M. and Rogers, H., (2021), “Managing Global Supply Chain Risks: Effects of the Industry Sector”. *International Journal of Logistics Research and Applications*, 1–24. doi:10.1080/13675567.2021.1873925.
- [70] Steele, P.T. and Court, B.H., (1996), *Profitable Purchasing Strategies: A Manager’s Guide for Improving Organizational Competitiveness Through the Skills of Purchasing*, London: McGraw-Hill Book Co.

- [71] Stock, J.R. and Boyer, S.L., (2009) "Developing a consensus definition of supply chain management: a qualitative study", *International Journal of Physical Distribution and Logistics Management*, Vol. 39 No. 8, pp. 690-711.
- [72] Tse, Y.K., Matthews, R. L. (2016), "Unlocking Supply Chain Disruption Risk Within the Thai Beverage Industry". *Industrial Management & Data Systems* 116 (1): 21–42
- [73] Vavra, S. and Stark, T., (2020), "How the Russian Hacking Group Cozy Bear, Suspected in the SolarWinds breach, plays the long game, Syberscoop, retrieved in 21.10.2021 from: <https://www.cyberscoop.com/cozy-bear-apt29-solarwinds-russia-persistent/>
- [74] Verbano, C. and Venturini, K., (2013), "Managing Risks in SMEs: A Literature Review and Research Agenda", *Journal of Technology Management & Innovation* 8, no. 3: 33–34, <https://doi.org/10.4067/S0718-27242013000400017>.
- [75] Watson, J., (2015), "Essays On Deceptive Counterfeits In Supply Chains: A Behavioral Perspective". All Dissertations, https://tigerprints.clemson.edu/all_dissertations/1589
- [76] Wieland, A and Wallenburg, C.M. (2013), "The Influence of Relational Competencies on Supply Chain Resilience: a Relational View", *International Journal of Physical Distribution & Logistics Management*, Vol. 43 No. 4, pp. 300-320.
- [77] Ziegenbein, A. and Nienhaus, J. (2004), "Coping with Supply Chain Risks on Strategic, Tactical, and Operational Level," *Proceedings of the Global Project and Manufacturing Management, Symposium, Siegen*, pp. 165–180.
- [78] Zsidisin, G.A., Panelli, A. and Upton, R., (2000), "Purchasing Organization Involvement in Risk Assessments, Contingency Plans, and Risk Management: An Exploratory Study", *Supply Chain Management*, Vol. 5, No. 4, pp. 187–198.
- [79] Zsidisin, G.A. and Wagner, S.M., (2010), "Do Perceptions Become Reality? the Moderating Role of Supply Chain Resiliency on Disruption Occurrence", *Journal of Business Logistics*, Vol. 31, No. 2, ss. 1-20.

FOLLOWERSHIP IN MILITARY ORGANIZATIONS: THE CASE OF THE ARMED FORCES OF THE PHILIPPINES

Noah HERNANDEZ*/**, Jaime BALLENA IV**

*Philippine Military Academy, Baguio City, Philippines

**Saint Louis University, Baguio City, Philippines

Kelley (1992) highlights the significance of followers in organizations for executing orders, supporting leaders, and maintaining operational effectiveness, but also warns of moral disengagement and deindividuation due to social norms and culture. This study explored the relationship between personality traits and followership in the ARMED FORCES OF THE PHILIPPINES (AFP), involving 423 military personnel who completed an online questionnaire assessing demographic characteristics, followership dimensions and styles, and personality traits. The findings revealed that most military personnel are exemplary followers with "average" personality traits, with some not fitting Kelley's five followership styles, suggesting an additional four styles. A significant correlation was found between personality traits and followership dimensions, except for emotionality. It also revealed a significant relationship between personality traits and followership styles, and demographic characteristics were linked to followership dimensions and styles, emphasizing the need for continuous learning in developing more effective leaders, followers, and organizations.

Key words: *followership, HEXACO, Kelley, military, personality traits.*

1. INTRODUCTION

Leaders have traditionally been credited with organizational success, while followers have been seen as passive recipients of leadership influence (Crossman & Crossman, 2011; Uhl-Bien et al., 2014). Kelley (1992) challenges the common belief that leaders solely provide power and drive achievements, citing Napoleon Bonaparte as an example of a leader

who would be ineffective without the support and contributions of his armies—his followers. With this growing recognition, followership studies have garnered increasing attention in recent years, especially in business organizations (Deale et al., 2022; Kelley, 1992), and have also expanded to education (Oyetunji, 2013; Taylor & Hill, 2017), healthcare (Leung et al., 2018; Peabody et al., 2022), and government (Blackshear,

2004). However, there is a paucity of literature on followership within the military setting. Exploring followership in this deeply hierarchical culture that prioritizes rank-based control and authority would offer a distinctive perspective.

In military organizations, followership is of particular importance. Military organizations are built on a followership ethos (Davis, 2020; United States Military Academy, 2018), and their members are expected to not only follow orders but also demonstrate initiative, adaptability, and loyalty (Halvorson, 2010; Redmond et al., 2015). However, this dynamic has its downsides since studies reveal that soldiers accept unlawful orders believing them to be legal and out of loyalty to the institution and their superiors (Osiel, 1998), making them more susceptible to moral disengagement (Johnson, 2014) and deindividuation (Berkowitz, 2014; Pina e Cunha et al., 2010), as evidenced by numerous cases of war crimes (Morrison, 2007), murders (Curaming & Aljunied, 2013; Punongbayan, 2023), and corruption (Gloria et al., 2011). The effectiveness of military operations relies heavily on the followers' ability to discern orders, execute tasks, make quick decisions in high-pressure situations, and work collaboratively within a hierarchical structure (Kalimuddin, 2017).

Moreover, previous researchers have suggested the need for additional investigation and empirical validation of the followership concept (Essa &

Alattari, 2019; Gross, 2019), along with the inclusion of diverse variables such as personal attributes, contextual factors, and organizational elements (Ivanoska et al., 2019; Mohamadzadeh et al., 2015; Uhl-Bien et al., 2014). On the other hand, studies have shown that personality traits are a predictor of numerous variables even in diverse contexts (Ali, 2019; de Jong et al., 2019; Eshet & Harpaz, 2021; Oyetunji, 2013; Singh, 2009), but little is known about their impact on followership behavior.

By exploring the relationship between personality traits and followership dimensions and styles, this study aims to contribute to the emerging field of followership in military organizations. This study seeks to bridge the gap in knowledge by investigating the relationship between personality traits and followership dimensions and styles among members of the ARMED FORCES OF THE PHILIPPINES (AFP). Through this exploration, we can uncover valuable insights that can inform recruitment, development, career management, and retention programs in military organizations. The findings of this study can provide a foundation for future research on followership and personality traits in the Philippine military and inform practical interventions to enhance leadership and follower dynamics within the organization.

This study is structured into four sections. Initially, we shall assess the theoretical and empirical studies on

followership and personality traits, focusing on the limited research conducted in military contexts and our research questions. Next, we proceed to outline our methodologies and present our findings. Following that, we provide descriptive and statistical data and thoroughly explain their implications. Finally, we present broad perspectives and suggest directions for further research.

1.1. Followership and the Military Organization

The AFP operates in a high-risk environment, requiring effective followers to carry out its functions, with even its highest-ranking military official being a follower of the

President as their Commander-in-Chief. Kelley (1992) asserted that the most effective followers are independent critical thinkers who actively participate in the process of accomplishing a common objective. This highlights that a follower's role is to pursue a common course of action with a leader to achieve organizational objectives while recognizing the authority and boundaries given to them (Schindler, 2015). Kelly (1992) stressed that the concept of followership is comprised of two dimensions: independent critical thinking (ICT) and active engagement (AE). The juxtaposition of these two dimensions constitutes the five styles of followers (Table 1).

Table 1. Kelley's Five Followership Styles

Followership Styles	Dimensions		Description	Distribution (in %)
	ICT	AE		
Exemplary	H	H	They are followers who think independently, are highly engaged, exude positive energy, and utilize their skills for the organization's benefit despite institutional barriers (Kelley, 1992, 2008).	0 - 35
Alienated	H	L	They are followers who think independently and critically yet are passive in their duties. They are capable but cynical, inhibit their efforts, and believe that the organization neglects them (Kelley, 1992, 2008).	15 - 25
Pragmatist	M	M	They are followers who fall in the middle of the spectrum, where they may question the authority of their leaders, but not too frequently or critically, and accomplish their jobs, but rarely exceed them (Kelley, 1992, 2008).	25 - 35
Conformist	L	L	They are followers that rely on their leaders to make decisions and constantly seek direction. In addition, they do not perform their duties with passion or commitment (Kelley, 1992, 2008).	5 - 10
Passive	L	H	They are followers who eagerly accept orders and acquiesce to the leader's authority, opinions, and judgment. They respect social order, find comfort in the hierarchy, and are always willing to obey the higher authority (Kelley, 1992, 2008).	20 - 30

Legend. H-High; M-Middling; L-Low; ICT-Independent Critical Thinking; AE-Active Engagement Adapted from *The Power of Followership* by R. Kelley (1992:97)

Studies have shown that the most effective followers are "exemplary followers" who can think independently, engage actively, and utilize their skills for the organization's benefit despite institutional barriers (Carsten et al., 2014; Kelley, 1992; Tahrir et al., 2020). On the other hand, Kelley (1992) and Corrothers (2009) highlight that passive followers are the least effective because they perform basic tasks and wait for instructions, whereas conformist followers are preferred by leaders because they do and say what the leader wants without question. Relatedly, Kalimuddin (2017) and Thomas and Berg (2014) argue that among the classification of followers, exemplary followers are best suited to carry out the mission command doctrine because they can deal with problems, take initiative, take risks, engage their superiors, and build connections. In addition, Chaleff (2009) emphasized that followers must possess the fortitude to act morally. However, Berg (2020) and Corrothers (2009) emphasize the importance of military personnel's ability to respectfully disagree with their leaders' flawed decisions, as they are often tasked with making crucial decisions in unpredictable situations with life-or-death consequences. Moreover, Rafae and Erritali (2023) underscored the relevance of personnel profiling in

constructing effective teams and interventions.

Uhl-Bein et al. (2014) found that enhancing followership necessitates innovative methods for understanding, collaborating with, and assessing various variables. Relatedly, expanding Kelley's followership styles can bring significant value to military profiling, the military organization, and the understanding of followership as a concept. Moreover, the AFP provides a valuable context for examining and enhancing followership within military organizations.

1.2. Personality Traits and the Military Organization

Siegel (2016) asserts that most human behavior is predictable, and organizations perform more efficiently when they can predict this behavior. Personality traits have been found to significantly influence behavior and predict variables in diverse contexts, suggesting that organizations can utilize personality inventories to understand better and manage their personnel (Carsten et al., 2014; Postigo et al., 2021; Taylor & Hill, 2017). Relatedly, studies show that personality traits may be useful in military selection, classification (Nye, 2022), team development (LePine & van Dyne, 2001; Mannes et al., 2022), and retention (Muchlis et al., 2022).

The HEXACO personality trait model, which Ashton and Lee developed in 2000, consisting of honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience, is deemed more comprehensive than the five-factor model (FFM) of personality traits (Lee & Ashton, 2012; McGrath et al.,

2018) (Table 2). Relatedly, HEXACO's extraversion, conscientiousness, and openness to experience are comparable to FFM personality traits, but agreeableness and emotionality in HEXACO are not equivalent to FFM's agreeableness and neuroticism (McGrath et al., 2018).

Table 2. HEXACO's Personality Traits and Descriptive Adjectives Observed in Cross-Cultural Lexical Studies

HEXACO Personality Traits	Personality – descriptive adjectives
Honesty-humility [H]	sincere, honest, faithful, loyal, modest, unassuming, fair-minded, ethical <i>versus</i> sly, deceitful, greedy, pretentious, hypocritical, boastful, pompous, conceited, self-centered
Emotionality [E]	emotional, oversensitive, sentimental, fearful, anxious, nervous, vulnerable, clingy <i>versus</i> tough, fearless, unemotional, independent, self-assured, unfeeling, insensitive
Extraversion [X]	outgoing, lively, extraverted, sociable, talkative, cheerful, active, vocal, confident <i>versus</i> shy, passive, withdrawn, introverted, quiet, reserved, inhibited, gloomy
Agreeableness [A]	patient, tolerant, peaceful, mild, agreeable, lenient, gentle, forgiving <i>versus</i> ill-tempered, quarrelsome, stubborn, choleric, temperamental, headstrong, blunt
Conscientiousness [C]	organized, self-disciplined, hard-working, efficient, careful, thorough, precise, perfectionist <i>versus</i> sloppy, negligent, reckless, lazy, irresponsible, absent-minded, messy
Openness to experience [O]	intellectual, creative, unconventional, imaginative, innovative, complex, deep, inquisitive, philosophical <i>versus</i> shallow, simple, unimaginative, conventional, close-minded

Adapted from *The H Factor of Personality* by K. Lee and M. C. Ashton (2012:22)

Lee and Ashton (2012) concluded that the general population exhibits personality traits that fall within the middle of the spectrum, with only a small proportion displaying significantly above or below normal values. Relatedly, limited studies using the HEXACO personality inventory show that uniformed personnel in Western countries score higher in

honesty-humility, extraversion, agreeableness, and conscientiousness, but lower in emotionality and openness to experience compared to the general population (Andrews et al., 2023; Lee & Ashton, 2018; Semrad & Scott-Parker, 2020; Ripley, 2019).

Relatedly, certain personality traits have been connected to certain aspects of military contexts, which may be valuable for personnel

management. Studies show that extraversion is more prevalent among West Point cadets in interpersonal and dynamic work contexts, while conscientiousness is more influential in educational and administrative contexts (Bartone et al., 2009). Conscientiousness is linked to academic performance and officer-like qualities in Indian cadets (Bobdey et al., 2021), and Lithuanian cadets' conscientiousness, openness to experience, and extraversion are also linked to their military and academic performance (Bekesiene, 2023).

While several variables have been studied alongside followership, little is known about personality traits as a variable, especially in the Philippine military setting. Furthermore, Bastardo and van Vugt (2019) emphasized the importance of further research into the correlation between personality traits and followership, while other previous researchers emphasized the importance of updating followership and personality trait literature and its applicability to military settings (Essa & Alattari, 2019; Happawana, 2021). By leveraging this knowledge, organizations can optimize their operations and create an environment conducive to success.

1.3. Research Questions

To address this research gap, this study aimed to explore the relationship between personality traits using the HEXACO model and followership dimensions and styles using Kelley's

model while taking into account demographic characteristics. To attain such objectives, this study seeks to answer the following research questions:

1. What is the distribution among the military personnel of the AFP in terms of the following?
 - a. followership dimensions
 - b. followership styles
 - c. personality traits
2. Is there a significant relationship between the respondents' personality traits and each of the following?
 - a. followership dimensions
 - b. followership styles
3. Is there a significant association between the respondents' demographic characteristics and each of the following?
 - a. followership dimensions
 - b. followership styles

Relatedly, the answers to these questions would significantly contribute to the profiling of AFP military personnel, a better understanding of the influence of personality traits on followership, particularly in the Philippine military setting, and would assist organizations in personnel management and the cultivation of the follower role.

2. METHOD

2.1. Participants and Procedures

The study engaged in quantitative correlational research. The study investigated the relationship between personality traits and followership dimensions and styles among active

officers and enlisted personnel in the Philippine Army, Philippine Air Force, and Philippine Navy. The study involved 423 respondents drawn randomly from a population of 146,390 active officers and enlisted personnel using a stratified sampling method and proportional allocation. The survey was distributed to AFP military personnel using a cloud-based platform, adhering to research ethics

standards of voluntary participation, confidentiality, and anonymity. Relatedly, the study, authorized by military authorities and coordinated with their human resource departments, lasted for two weeks. The demographic profile of the participants is reported in Table 3.

Table 3. Respondents' Profile by Demographic Characteristics

Demographic characteristics	f	Demographic characteristics	f
Gender		Years of Military Service	
Male	353	>5	112
Female	70	5-9	119
Total	423	10-14	78
Age		15-19	65
20-29	171	20-24	24
30-39	171	25-29	19
40-49	73	30-34	4
<49	8	<34	2
Total	423	Total	423
Educational Attainment		Role of Unit	
High School	119	Command and Control	147
College	288	Combat	53
Masters	16	Combat Support	106
Doctorate	0	Combat Service Support	117
Total	423	Total	423
Branch of Service		Job Category	
Army	301	Commanding Officer	13
Air Force	54	Staff Officer	24
Navy	68	Technical Officer	6
Total	423	Administrative	139
Rank		Specialized	93
General	3	Combat Soldier	148
Field Grade	15	Total	423
Company Grade	20	Leadership Courses	
Senior NCO	11	With	155
NCO	140	Without	268
Junior EP	234	Total	423
Total	423	Followership Courses	
Personnel Category		With	129
Officer	38	Without	294
Enlisted Personnel	385	Total	423
Total	423		

2.2. Measures

The questionnaire, considering the existing literature, consisted of a three-part survey, including demographic characteristics, modified Kelley's Followership Questionnaire (KFQ), and the 60-item HEXACO Personality Inventory-Revised (HEXACO-60). The demographic characteristics included the respondent's gender, age, branch of service, personnel category, rank, length of active service, unit's role, job category, and level of education. Similarly, the

modified KFQ measures ICT and AE by assessing participants' frequency of behaviors on a seven-point Likert scale (0 = *never* to 6 = *every time*). Responses are summed and classified as "high," "middling," or "low" for each dimension, determining the respondents' followership style (Table 1). However, juxtaposing the "middling" with "low" and "high" in ICT or AE can reveal four additional followership styles (Table 4).

Table 4. Four Additional Followership Styles to Kelley's Model and its Description

Followership Styles	Followership Dimensions		Description
	ICT	AE	
Alienated-Exemplary	H	M	These followers can think for themselves and challenge the established quo. They are not hesitant to question their leaders or to propose new ideas. Their level of effort, however, may vary based on the situation. In some settings, they may be highly motivated and involved, but not in others.
Passive-Alienated	M	L	They are followers who sometimes come up with new, creative ideas, but most of the time they fail to perform their duties with much energy or commitment. Also, they can be idealistic and unrealistic, and they may not always be willing to put in the hard work needed to see their plans through.
Passive-Conformist	L	M	They are followers who avoid making decisions or taking risks and who are reluctant to speak up or share their ideas, even if they are excellent. Because they want to please their superiors, they occasionally perform better than anticipated on the job.
Conformist-Exemplary	M	H	They are followers who demonstrate a willingness to execute their leader's instructions and objectives effectively. However, they are also most likely to express their own perspectives and ideas, based on the circumstances. In addition, they exhibit a willingness to assume responsibility and transcend expectations for their assigned tasks.

Legend. H-High; M-Middling; L-Low; ICT-Independent Critical Thinking; AE-Active Engagement

Relatedly, six experts validated the modified KFQ, resulting in an Aiken's V coefficient of 0.83-1, I-CVI coefficient of 0.83-1, SCVI/Ave value of 0.99, SCVI-UA coefficient

of 0.92, and a Cronbach Alpha coefficient of 0.91 when piloted with 52 individuals. On the other hand, the HEXACO-60 measures six personality traits: honesty-humility,

emotionality, extraversion, agreeableness, conscientiousness, and openness to experience, using a five-point Likert scale (1 = *strongly disagree* to 5 = *strongly agree*) to assess respondents' agreement with each statement. Responses are summed and classified as "well-below average [WBA]," "somewhat below average [SBA]," "about average [AA]," "somewhat above average [SAA]," or "well-above average [WAA]" for each personality trait. Previous studies on the instrument show internal consistency reliabilities of 0.73 to 0.80 (Ashton & Lee, 2009; Bashiri et al., 2011) and test-retest reliability of 0.88 (Henry et al., 2022). Similarly, the HEXACO-60's developers agreed to use their instrument in the study.

2.3. Data Analysis

The study used the trial version of IBM SPSS Statistics version 22.0 to analyze data on followership dimensions, followership styles, and personality traits. Descriptive statistics were used to examine the distribution of these variables. Normality tests were conducted before the choice of appropriate

statistical methods. The Kolmogorov-Smirnov test showed a non-normal distribution of personality traits, requiring non-parametric methods for inferential analyses. Spearman's Rho correlation coefficient was used to examine the significant relationship between personality traits and followership dimensions and Fisher's exact test was used to assess the significant association between the demographic characteristics and followership dimensions and styles. In the attempt to determine the relationship between personality traits and followership styles, significant-difference tests were performed with the personality trait scores across the categories of followership styles. When a significant difference exists, it implies that personality trait scores are significantly associated with followership styles. In this regard, the Kruskal-Wallis test was used as the significant-difference test.

3. RESULTS AND DISCUSSION

3.1. Distribution of Military Personnel of the AFP in Terms of Followership Dimensions

Table 5. Median and Interquartile Ratings for the Followership Dimensions (n = 423)

Followership Dimensions								
Independent Critical Thinking [ICT]				Active Engagement [AE]				
Questions	IQR	Mdn	descr	Questions	IQR	Mdn	descr	
Q1: I think about how the things I do help my office or unit reach its objective.	1	5	U	Q3: I ensure that my personal work goals are aligned with the objectives of my office or unit.	1	5	U	
Q2: I think about how my work helps me reach the goals I have set for myself.	1	5	U	Q4: I go the extra mile to complete the tasks that have been assigned to me.	1	5	U	
Q7: I take the initiative to determine which tasks are most critical in accomplishing the office's or unit's objectives.	1	5	U	Q5: I am excited to do the tasks that have been given to me.	1	5	U	
Q13: I can easily come up with new ideas to assist the leader in completing the task.	2	5	U	Q6: I can make my workmates feel as enthusiastic as I am.	1	5	U	
Q14: I am supportive of unique suggestions that will assist the leader in accomplishing the objective.	1	5	U	Q8: I make an effort to improve my skillset so that I can be more useful to my office or unit.	1	5	U	
Q15: I make an effort to solve problems on my own rather than waiting for the leader to do so.	2	5	U	Q9: I strive to succeed in every duty assigned to me by my leader.	1	6	E	
Q18: I "play the devil's advocate" to help people think about the advantages and disadvantages of an idea or plan.	2	4	F	Q10: I can be relied upon by my leader to finish my tasks without supervision.	1	5	U	
Q21: I frequently assess my own strengths and weaknesses.	2	5	U	Q11: I am willing to perform duties outside of my job description.	2	5	U	
Q22: I am honest while evaluating my own strengths and weaknesses.	1	5	U	Q12: I give my best when working in a team even when I am not the leader.	1	6	E	
Q23: I regularly think about whether or not my leader's decision was the best option.	1	5	U	Q16: I am willing to help workmates even if they do not express gratitude.	1	5	U	
Q24: I can openly tell my leader "NO" instead of "YES" when his or her orders are against what I believe in.	3	3	S	Q17: I highlight the accomplishments of my workmates even if I do not receive recognition.	1	5	U	
Q25: I adhere to my own ethical standards rather than those of the group.	2	4	F	Q19: I take the time to comprehend the perspective of my leader.	2	5	U	
Q26: I share my views on significant issues, even if they contradict those of my leader.	2	4	F	Q20: I strive to provide my leader with the resources he or she needs to complete the task.	1	5	U	

Legend. IQR – interquartile rating, Mdn – median, E – every time (100% of the time), U – usually (about 90% of the time), F – frequently (about 70% of the time), S – sometimes (about 50% of the time)

McIntyre et al. (2010) suggest that a seven-point Likert scale ordinal data has reached consensus if the interquartile rating (IQR) is 0 to 1, otherwise, it indicates no consensus. Table 5 shows that respondents agree that, approximately 90% of the time, they consider the impact of their actions on their office's goals, take the initiative to identify critical tasks, support unique suggestions, evaluate strengths and weaknesses, and

regularly evaluate the leader's decision. However, there is a divide on other ICT-related items, most notably in explicitly disagreeing with superiors or deviating from norms. They also agree that they aspire for excellence in all tasks assigned to them by their leader, even when not the leader.

Similarly, there is consensus that approximately 90% of the time, respondents align their personal work goals with office objectives,

complete tasks enthusiastically, improve skills, succeed in duties, and provide resources to their leader, as well as demonstrate a willingness to assist, highlight the accomplishments of coworkers, and offer assistance when required. On the other hand, respondents' views on the remaining items about AE, specifically their willingness to undertake tasks beyond their job description and understanding their leader's perspective, exhibit notable diversity.

The findings align with conventional military culture and the interactions between leaders and followers (Halvorson, 2010; Redmond et al., 2015). It suggests a shared social identity in which an individual adopts a group-associated image or behavior (National Research Council [NRC], 2014), which significantly influences their individual behavior (Charness & Chen, 2020). Freeman (1948) highlights that the “military hierarchy has an established system of stratification for power, authority, status, and privilege, denoted within its ranks” (p. 79), emphasizing strict adherence to orders and utmost respect for the chain of command, especially among followers (Blackshear, 2004; Davis, 2020; Halvorson, 2010; Litzinger & Schaefer, 1982; Peters & Haslam, 2018; Redmond et al., 2015). These norms can impact their affiliation with the military team or institution,

potentially affecting their careers and work dynamics (Collinson, 2008; NRC, 2014). Furthermore, this system prevents deviation and dissent while rewarding compliance to maintain social order, reduce individualism, enforce compliance, and eliminate non-conformity, enhancing operational effectiveness.

However, Berg (2020) and Chaleff (2008, 2009) emphasize the significance of a soldier's ability to “professionally disagree” with leaders' flawed decisions, especially in unpredictable situations with life-or-death consequences, and the courage of followers to support and improve leaders' achievements. The Centre for Army Leadership [CAL] (2023) suggests that fostering a military environment in which all individuals, regardless of rank or seniority, feel comfortable discussing their thoughts, questions, and challenges with respect and propriety (i.e., support in public, disagree in private) can improve decision-making, increase innovation, and reduce failures, giving organizations a competitive advantage. Likewise, compared to their civilian counterparts, followers of military organizations must be able to communicate their professional disagreements effectively while navigating the organization's stratification system, traditions, customs, and ultra-hierarchical structure. Nevertheless, “professional

disagreement” reinforces the AFP's inherent duty to follow legal orders and the moral duty to resist unlawful orders that may endanger fellow soldiers, the organization, stakeholders, and the nation, in exchange for potential personal gains. In addition, it strengthens the spirit and implementation of the Geneva Conventions, the International Criminal Court's Rome Statute, as well as the AFP's Articles of War, code of ethics, grievance system, and customs and traditions, particularly the traditions of duty and honor.

3.2. Distribution of Military Personnel of the AFP in Terms of Followership Styles

Rafae and Erritali (2023) highlight the importance of profiling in management for understanding and predicting followers' demands and behaviors. They suggest that military profiling can improve team composition, people management, and overall performance. In a military setting, knowing the followership style of each follower enables leaders to predict how various types of followers will respond to mission command, which promotes decentralized execution and subordinate decision-making consistent with the commander's intent (Kalimuddin, 2017). The distribution of the respondents according to their followership style is presented in Table 6.

Table 6. *Distribution of the Respondents According to Their Followership Style*

Followership Styles	ICT			AE			Total	
	<i>Low</i>	<i>Middling</i>	<i>High</i>	<i>Low</i>	<i>Middling</i>	<i>High</i>	<i>n</i>	<i>%</i>
Exemplary	0	0	308	0	0	308	308	72.8%
Pragmatist	0	31	0	0	31	0	31	7.3%
Passive-Conformist	1	0	0	0	1	0	1	0.2%
Passive-Alienated	0	1	0	1	0	0	1	0.2%
Conformist-Exemplary	0	78	0	0	0	78	78	18.4%
Alienated-Exemplary	0	0	4	0	4	0	4	0.9%
Total	1	110	312	1	36	386	423	100%

Legend. ICT-Independent Critical Thinking; AE-Active Engagement

Table 6 shows that the majority of Philippine military personnel (72.8%) are exemplary followers. This finding corroborates previous studies indicating that an organization has over 35% exemplary followers, challenging Kelley's estimates (Essa & Alattari, 2019; Novikov, 2016; Ntiamoah,

2018; Peabody et al., 2022; Thomas, 2014; Urooj et al., 2020). The study also suggests that the Philippine military effectively attracts, develops, and retains followers who are well-suited to the complex, demanding, and unpredictable military environment, requiring critical thinking, independent action, and initiative. Relatedly, it suggests

that most Philippine military followers are committed to mission success, risking their safety and well-being to achieve it, which are hallmarks of exemplary followers. CAL (2023), Collinson (2008), Kalimuddin (2017), and Thomas and Berg (2014) highlight the significance of exemplary followers in high-performing organizations, the implementation of the military's mission command doctrine, and the success of 21st-century organizations. They argue that exemplary followers can exercise disciplined initiative, empower knowledge workers, and distribute leadership, making them crucial for effective task performance and collaboration. Kelley (1992) further emphasizes the significance of a growing number of exemplary followers. However, Crossman and Crossman (2011) emphasize that excessive critical thinking can hinder leaders' decision-making abilities. Furthermore, although most AFP military followers are categorized as exemplary due to their "high" scores in ICT and AE, a thorough analysis of these scores (Table 4) suggests that these exemplary followers struggle to professionally disagree with their superiors. The analysis also suggests that, while followers may fall into a specific followership style based on the aggregation of item scores leading to descriptive equivalents for ICT and AE, there may be particular

characteristics that correspond to said followership style that are present or missing.

The conformist-exemplary followers (18.4%) were ranked second, as it is unlikely that all followers are exemplary. These followers, while sharing similarities with exemplary followers, lack certain attributes in independent thinking, creativity, or courage. Relatedly, the findings suggest that most conformist-exemplary followers in the AFP need more courage to challenge their leaders' decisions and organizational norms. However, Chaleff (2008) emphasized the importance of professional disagreement with authority figures if they compromise the collective objective. Relatedly, conformist-exemplary followership is one of four newly defined followership styles that are all present in this study, which also includes passive-conformist, passive-alienated, and alienated-exemplary followership styles, which are less commonly observed.

On the other hand, there were a few pragmatist followers among military personnel who are capable contributors but whose actions and decisions are primarily motivated by self-preservation (CAL, 2023; Kalimuddin, 2017). This could be because the military social system's emphasis on obedience and conformity shapes individual

professional paths and relationships (Collinson, 2008; NRC, 2014). Moreover, the findings reveal that the AFP does not have passive or conformist military followers, which are ineffective followers that can promote toxic leadership and climate (CAL, 2023; Corrothers, 2009; Kalimuddin, 2017).

3.3. Distribution of Military Personnel of the AFP in Terms of Personality Traits

Table 7. Distribution of the Respondents According to Their Personality Traits (n=432)

Personality traits	High				Average				Low				Mean Score
	WAA		SAA		AA		SBA		WBA				
	n	%	n	%	n	%	n	%	n	%			
Honesty-Humility	27	6.4	159	37.6	216	51.1	21	5.0	0	0	34.83 (AA)		
Emotionality	0	0	17	4.0	318	75.2	82	19.4	6	1.4	30.00 (AA)		
Extraversion	6	1.4	108	25.5	300	70.9	9	2.1	0	0	33.69 (AA)		
Agreeableness	6	1.4	92	21.7	314	74.2	11	2.6	0	0	33.49 (AA)		
Conscientiousness	21	5.0	165	39.0	215	50.8	22	5.2	0	0	34.83 (AA)		
Openness to Experience	7	1.7	89	21.0	309	73.0	17	4.0	1	0.2	32.91 (AA)		

Legend. WBA- well below average, SBA- somewhat below average, AA- about average SAA- somewhat above average, WAA- well above average

Table 7 indicates that a substantial percentage of military personnel in the Philippines exhibit scores categorized as “average” (AA) in all the personality traits such as honesty-humility, emotionality, extraversion, agreeableness, conscientiousness, and openness to experience. This means that the AFP typically recruits and retains military personnel with "average" personality traits—those who are willing to work with others, motivated, emotionally stable, tolerant of physical danger, and able to deal with problems like authority, criticism, slow promotion, and limited amenities (Department of National Defense, 2014). Skoglund et al. (2023) imply that "average"

personality traits indicate an overall adaptable personality functioning that is appropriate for military settings. This corroborates with previous studies that most individuals have middle-spectrum personality traits, with a small percentage showing significantly above or below normal values (Lee & Ashton, 2012). Furthermore, military personnel outside the middle spectrum exhibit "high" honesty-humility, extraversion, agreeableness, conscientiousness, and openness to experience, while being “low” in emotionality, indicating that military personnel of the AFP who fall outside the middle spectrum are more likely to be rule-abiding, self-assured, assertive, collaborative, disciplined,

innovative, and resilient in the face of adversity. This finding is consistent with earlier studies on personality traits in the military and uniformed service professions, implying that the nature and duties of the profession necessitate such a personality profile (Andrews et al., 2023; Marcus et al., 2016; Ramadan et al., 2022; Ripley, 2019; Semrad & Scott-Parker, 2020). Skoglund et al. (2023) suggest that the military can benefit from a profile that requires emotional stability, conscientiousness, and social competence to cope with security issues, confidentiality, and a complex environment. Nonetheless, such a profile may also contribute to high-risk behavior, apathy, competitive rivalry, exploitation, and indifference toward interpersonal relationships (Lee & Ashton, 2012).

However, military personnel of the AFP exhibit lower conscientiousness scores compared to the previously studied general population and among military and uniformed service professionals (Andrews et al., 2023; Lee & Ashton, 2018; Semrad & Scott-Parker, 2020; Ripley, 2019). Conscientiousness, a trait indicating organization, diligence, perfectionism, and prudence (Lee & Ashton, 2012; Piotrowski & Pękała, 2016), is expected to be higher in the military due to dangerous conditions and public servant status. However, factors like employment security,

reduced competition, limited promotion opportunities, and the demanding, unpredictable, and stressful nature of the military environment contribute to low levels of conscientiousness (Piotrowski & Pękała, 2016).

Furthermore, approximately 16% of military personnel exhibited "high" levels of both honesty-humility and agreeableness, suggesting an inclination toward cooperative behavior (Lee & Ashton, 2012). Such trait combination fosters harmony, enhances communication (LePine & van Dyne, 2001; Mannes et al., 2022), and enhances retention (Muchlis et al., 2022), which is particularly beneficial in military environments where collaboration is crucial for mission success. On the other hand, approximately 5% of military personnel have "low" honesty-humility, whereas 70% have tendencies toward criminal behavior, greed, aggressive nonconformism, selfish ambition, narcissism, or manipulation (Lee & Ashton, 2012) that are detrimental to military operations and the profession's image as a noble one.

3.4. Significant Relationship Between Personality Traits and Followership Dimensions of Military Personnel in the AFP

Table 8. Establishing the Relationship Between the Respondents' Personality Traits and Followership Dimensions Using Spearman's Rho Correlation Coefficient

Personality traits	Independent Critical Thinking [ICT]		Active Engagement [AE]	
	<i>r</i>	<i>p-value</i>	<i>r</i>	<i>p-value</i>
Honesty-Humility	-0.124	0.011	0.150	0.002
Emotionality	0.062	0.202	0.011	0.819
Extraversion	0.179	<0.001	0.295	<0.001
Agreeableness	-0.007	0.892	0.234	<0.001
Conscientiousness	-0.020	0.684	0.264	<0.001
Openness to Experience	0.094	0.053	0.209	<0.001

Table 8 indicates a very weak negative correlation between ICT and honesty-humility and a weak positive correlation between ICT and extraversion. There was also a very weak positive correlation between AE and honesty-humility and a weak positive correlation between AE and extraversion, agreeableness, conscientiousness, and openness to experience. However, no significant correlation was found between emotionality and ICT or AE. The study reveals that personality traits are correlated with the followership dimensions except for emotionality. This correlation between personality traits and followership dimensions implies that certain personality traits tend to be more conducive to showing a particular followership behavior among the military personnel of the AFP.

Furthermore, the initial expectation was that honesty-

humility would have a positive correlation with ICT due to its association with moral foundations. However, the study's outcomes suggest otherwise, indicating that military personnel may be inclined to morally justify their behavior in the context of mission accomplishment. Ścigała et al. (2023) argue that honesty-humility is anchored on morality, such as individual rights and welfare, rather than loyalty and authority, which are necessary for sustaining social order and group cohesion. Relatedly, Brunk et al. (1990) assert that the military's moral rights stem from its duty to fulfill its mission and protect its troops, and when these goals become compromised, a morally neutral stance seems to take precedence. Other studies indicate that critical thinking and moral reasoning are related (Borisová & Pintes, 2022; Fasko, 1994), and moral reasoning can be used to rationalize ethical

concerns (Mudrack & Mason, 2019). However, Mulder and van Dijk (2020) warn that pursuing moral justification can lead to the continuation and worsening of previously unacceptable conduct. On the other hand, the positive correlation between ICT and extraversion suggests that individuals with high extraversion are more likely to exhibit independent critical thinking, suggesting that ICT is a cognitive and social ability that enables independent, impartial assessment of information under pressure, a skill crucial for success in various professions, including the military. The findings partially support the findings of Kudek et al. (2020) and Mushonga and Torrance (2008) using FFM and Jokić and Purić (2019) using HEXACO on the correlation between extraversion, conscientiousness, openness to experience, and ICT, with Jokić and Purić (2019) also finding a correlation between honesty-humility and ICT.

The positive correlation between AE and honesty-humility, extraversion, agreeableness, conscientiousness, and openness to experience indicates that AFP personnel with high levels of these personality traits are more likely to be involved and engaged in military activities and tasks. Similarly, findings from this research suggest that certain personality traits

can enhance military engagement. Furthermore, it suggests that military personnel in the AFP with high levels of these personality traits are more likely to be trusted by their superiors and fellow soldiers, get along with other members, settle disagreements peacefully, perform well on their tasks, and come up with new ideas and plans to help them stay ahead in combat. In addition, studies indicate that conscientious and engaged team members significantly influence self-managed teams, motivating colleagues and maintaining focus on given duties (Barrick & Mount, 1993; Costa & McCrae, 1992, as cited in Mushonga & Torrance, 2008).

The findings support previous findings on the correlation between extraversion and conscientiousness (Kim et al., 2019; Kudek et al., 2020; Machiha & Brew, 2019; Mushonga & Torrance, 2008; Sharma & Tripathi, 2023; Singh & Kaushik, 2015), and openness to experience and AE (Kudek et al., 2020; Mushonga & Torrance, 2008). Furthermore, the study shows that taking these traits into account during personnel selection could assist in identifying individuals with a greater likelihood of success in military roles, resulting in more effective recruitment and placement decisions. The study also confirms previous findings that there is no correlation between emotionality and ICT or AE (Jokić & Purić, 2019; Machiha &

Brew, 2019), suggesting that emotionality may not appear to impair the critical thinking or following behavior of military personnel of the AFP.

3.5. Significant Relationship Between Personality Traits and Followership Styles of Military Personnel in the AFP

Table 9. Respondents' Personality Trait Median Scores Across the Different Followership Styles, Including the P-Values Derived Using the Kruskal-Wallis Test

Followership Styles	Honesty-Humility (p<0.001)	Emotionality (p=0.747)	eXtraversion (p<0.001)	Agreeableness (p=0.001)	Conscientiousness (p=0.003)	Openness to Experience (p=0.031)
Exemplary	35	30	34	33	35	32
Pragmatist	30	30	30	30	30	30
Passive-Conformist	37	32	33	37	33	28
Passive-Alienated	30	29	30	31	31	32
Conformist-Exemplary	36	30	33	34	35	32
Alienated-Exemplary	29.5	31.5	32.5	31	31.5	30

Note. The bold values indicate the followership style(s) which are significantly different from the others. If there 2 or more bold values, this indicates that these 2 or more followership styles are not significantly different.

Table 9 shows that there are statistically significant differences observed in the personality traits of honesty-humility (p<0.001), extraversion (p<0.001), agreeableness (p=0.001), conscientiousness (p=0.003), and openness to experience (p=0.031) across various followership styles, but not for emotionality (p=0.747). Moreover, post hoc analysis indicates that exemplary, passive-conformist, and conformist-exemplary followers share similar attributes associated with honesty-humility, extraversion, agreeableness, and conscientiousness, while exemplary, passive-alienated, and conformist-exemplary followers share similar attributes associated with openness to experience. The findings seem to suggest that exemplary, passive-conformist, and conformist-

exemplary followers may tend to cooperate despite potential exploitation, promote positive relationships, and implement disciplined initiatives, whereas exemplary, passive-alienated, and conformist-exemplary followers may tend to generate "out-of-the-box" approaches to problems. However, the study observed only one respondent for each passive-conformist and passive-alienated followership style, indicating a need for further investigation to substantiate the findings (Lee & Ashton, 2012). CAL (2023), Collinson (2008), Kalimuddin (2017), and Thomas and Berg (2014) argued that exemplary followers are the best-suited followers for implementing the mission command doctrine. However, the findings may seem to suggest that conformist-exemplary followers with similar

personality traits as exemplary followers might serve as the most suitable substitute.

The study suggests that personality traits may seem to influence followership styles, suggesting that the military should recruit and develop individuals with these personality traits for military success. This aligns with military organizational expectations and requirements. The study also suggests that individuals joining the AFP may already possess or develop these personality traits due to training and experiences. Understanding the relationship between personality traits and followership styles can help shape the military force, contributing to a more cohesive and effective force. Furthermore, the findings provide additional evidence that indicates a significant relationship between an individual's personality traits and their behavioral approaches (Burtäverde et al., 2017; Ching et al., 2014; de Vries, 2012, 2018; El Othman et al., 2020; Ones et al., 2005; Postigo et al., 2021; Robbins & Judge, 2013; Sarsam et al., 2021), even in diverse contexts (Ali, 2019; de Jong et al., 2019; Eshet & Harpaz, 2021; Oyetunji, 2013; Singh, 2009), highlighting the importance of understanding these relationships. In addition, the findings align with trait theory, which suggests that individuals possess inherent personality traits that differentiate

them from others, aiding in understanding people's behavior across different cultures and contexts (Church & Katigbak, 2002).

Breevaart and de Vries (2019) found that their personality traits also influence followers' preferences for leadership styles. Low honesty-humility and high extraversion and openness to experience followers prefer leaders who motivate and work for the organization's betterment, while those with low openness to experience prefer leaders who clearly define roles and prioritize task completion. In business industries, followers prefer leaders who uphold high standards, are concerned with relationships, share decision-making, and whom they can identify (Ganzemiller et al., 2021). Relatedly, generation Z appreciates leaders who take a respectful and trusting approach to leadership (Nikolic, 2022). Similarly, Gonzales (2016) and Sefidan et al. (2021) found that the same approach is favored among military followers and has an advantageous impact on performance. However, Port (2020) argues that military followers want to be led in different leadership styles depending on the situation of military operations.

3.6. Significant Association Between Demographic Characteristics and Followership Dimensions of Military Personnel in the AFP

Table 10. Establishing the Significant Association Between the Respondents' Followership Dimensions and Each of the Demographic Characteristics Using Fisher's Exact Test (n=432)

Demographic characteristics	p-value	
	Independent Critical Thinking [ICT]	Active Engagement [AE]
Gender	0.250	0.999
Age	0.732	0.108
Educational attainment	0.580	0.365
Years of military service	0.528	0.184
Branch of service	0.336	0.495
Rank	0.294	0.428
Personnel category	0.057	0.301
Role of unit	0.305	0.097
Job category	0.089	0.862
Leadership courses	0.027	0.140
Followership courses	0.687	0.065

Table 10 shows that only leadership course completion ($p=0.027$) has a significant association with ICT among the demographic characteristics. On the other hand, it also shows that no association exists between the demographic characteristics and AE. The study reveals a relationship between a military personnel's leadership course completion, confirming previous research indicating this relationship (Ricketts, 2005). On the other hand, the study partially confirms previous findings that no significant differences were found between ICT and AE and demographic characteristics such as gender, age, length of service, sub-agency, and educational attainment

(Gajdhane, 2023; Kim, 2011; Playter, 2022).

Ricketts (2005) found a significant relationship between higher levels of leadership training and increased critical thinking scores. Leadership training teaches critical thinking skills, including identifying and analyzing relevant information, evaluating options, and making sound decisions. These skills are crucial for military personnel, who need to make quick, effective decisions in unpredictable situations. Leadership training also fosters an environment of open inquiry and debate, encouraging participants to question assumptions, challenge authority, and generate their own ideas, helping participants think independently and not just follow the

lead of others. Similarly, the AFP implements a progressive professional military education that includes leadership and management modules tailored to the present and future roles of the military personnel. In addition, its content includes reflective thinking, problem-solving, effective communication, military decision-making, and scenario-based exercises, which may account for the relationship between leadership course completion and critical thinking. Instructional interventions promoting collaborative learning and real-world problem-solving also enhance critical thinking (Abrami et al., 2008, 2015, as cited in Evans, 2020). However, it is important to note that training does not necessarily change in short periods but requires repeated opportunities for development over a long period (Evans, 2020).

The lack of a relationship between ICT and other demographic characteristics in the AFP may be attributable to its selection, career management, and retention system, which routinely evaluates the critical thinking ability of military personnel throughout their service to ensure their suitability for military service (DND, 2014). Furthermore, the findings suggest that the military environment, including the AFP, may be designed to minimize individual differences and promote conformity due to its hierarchical structure and

reliance on teamwork (Davis, 2020; Freeman, 1948; Goodwin et al., 2018; Kalimuddin, 2017). However, ICT is crucial for military personnel but can be seen as a liability in situations requiring quick and decisive action (Crossman & Crossman, 2011). Similarly, the prevailing AFP culture promotes conformity and discourages dissent by emphasizing loyalty, discipline, and respect for authority (Collinson, 2008; NRC, 2014). While ICT is crucial for challenging norms and promoting innovation, it may be perceived as subversive in a culture that values obedience and authority (Freeman, 1948). Relatedly, this study partially supports Dunham's (2019) findings that there is no relationship between ICT and gender and branch of service among military personnel.

Furthermore, Goodwin et al. (2018), Kalimuddin (2017), and Voss and Ryseff (2022) highlight that the military prioritizes mission success, necessitating the full involvement and outstanding performance of all those involved through teamwork and commitment to assigned roles, which may account for the absence of an association between demographic characteristics and AE. Relatedly, Freeman (1948) highlights that the positional hierarchy and clear succession enable individuals to exercise authority without conflict, thereby encouraging everyone to

participate actively in military activities. Furthermore, Halvorson (2010) highlights that despite demographic differences, military personnel's love for the country, voluntary nature, fraternal ties, and shared life-and-death experiences enable them to remain highly engaged in performing diverse tasks.

In addition, the lack of association between the majority of demographic characteristics and either ICT or AE may be attributed to the social norms that exist and are reinforced within the AFP, such as "obey first before you complain," "learn to do without asking why," "rank has its privileges," "fault of one, fault of all," and "leave no one behind." The findings may seem to suggest that the prevailing social norms in the AFP create pressure to conform to the majority group, causing minorities to blend in and avoid standing out. This pressure can lead to uniformity in critical thinking and engagement across demographic characteristics, resulting in a

situation where everyone in the AFP thinks and behaves similarly regardless of their demographic characteristics. Halvorson (2010) and Lee (2018) explain that all military personnel are expected to observe these social norms, which could influence their critical thinking and engagement level. Relatedly, these social norms become a part of the ways they think, feel, and behave (NRC, 2014). It also suggests that military social norms may affect ICT and involvement across demographics. Recognizing these implications helps create a more inclusive and participatory military culture that encourages active engagement across all demographics.

3.7. Significant Association Between Demographic Characteristics and Followership Styles of Military Personnel in the AFP

Table 11. Establishing the Significant Association Between the Respondents' Followership Style and Each of the Demographic Characteristics Using Fisher's Exact Test (n=432)

Demographic characteristics	Category	Followership Styles						Total	p-value
		E	P	PC	PA	CE	AE		
Gender	Male	263	26	1	1	59	3	353	0.304
	Female	45	5	0	0	19	1	70	
Age	20-29	117	13	0	1	36	4	171	0.088
	30-39	129	8	1	0	33	0	171	
	40-49	56	8	0	0	9	0	73	
	<49	6	2	0	0	0	0	8	
Educational Attainment	High School	88	12	0	0	17	2	119	0.580
	College	206	19	1	1	59	2	288	
	Masters	14	0	0	0	2	0	16	
Years of Military Service	>5	72	11	0	1	26	2	112	0.999
	5-9	88	3	0	0	26	2	119	
	10-14	59	4	0	0	15	0	78	
	15-19	51	7	1	0	6	0	65	
	20-24	19	3	0	0	2	0	24	
	25-29	14	2	0	0	3	0	19	
	30-34	3	1	0	0	0	0	4	
<34	2	0	0	0	0	0	2		
Branch of Service	Army	221	19	0	1	57	3	301	0.515
	Air Force	50	7	0	0	11	0	68	
	Navy	37	5	1	0	10	1	54	
Rank	General	3	0	0	0	0	0	3	0.999
	Field Grade	14	0	0	0	1	0	15	
	Company Grade	17	1	0	0	2	0	20	
	Senior NCO	8	3	0	0	0	0	11	
	NCO	105	10	1	0	24	0	140	
	Junior EP	161	17	0	1	51	4	234	
Personnel Category	Officer	34	1	0	0	3	0	38	0.278
	Enlisted Personnel	274	30	1	1	75	4	385	
Job Category	Commanding Officer	12	0	0	0	1	0	13	<0.001
	Staff Officer	21	1	0	0	2	0	24	
	Technical Officer	5	0	0	0	0	1	6	
	Administrative	95	13	0	0	31	0	139	
	Specialized	70	5	1	0	15	2	93	
	Combat Soldier	105	12	0	1	29	1	148	
Role of Unit	Command and Control	110	11	1	0	23	2	147	0.325
	Combat	34	8	0	0	10	1	53	
	Combat Support	82	5	0	0	18	1	106	
	Combat Service Support	82	7	0	1	27	0	117	
Leadership Courses	With	121	15	1	0	16	2	155	0.003
	Without	187	16	0	1	62	2	268	
Followership Courses	With	96	13	0	1	17	2	129	0.091
	Without	212	18	1	0	61	2	294	

Legend: E-Exemplary; P-Pragmatist; PC-Passive-Conformist; PA-Passive-Alienated; CE-Conformist-Exemplary; AE-Alienated-Exemplary

Table 11 shows that only job category ($p < 0.001$) and leadership course completion ($p = 0.003$) have a significant association with followership styles among the demographic characteristics. This finding suggests that the AFP can use job categories to identify and develop individuals suitable for followership roles. For instance, soldiers with high

discipline [conscientiousness] and confidence [extraversion] are chosen for combat roles, while those with creativity and problem-solving skills [openness to experience] are chosen for support roles (Bartone et al., 2009). This association also has implications for military training and development, as different types of training can be provided to soldiers in

different job categories to develop the necessary followership behavior.

This finding may also imply that AFP military personnel use varied followership styles dependent on their designation, emphasizing a role-based followership approach. Davis (2020), Freeman (1948), Goodwin et al. (2018), and Kalimuddin (2017) highlight that the military organization is highly structured and hierarchical, with clearly defined roles that determine the level of one's authority, power, responsibility, and accountability. The military demands soldiers to be behaviorally adaptable to perform various roles due to the complexity and unpredictable nature of their operational environment (NRC, 2008; Port, 2020). Voss and Ryseff (2022) emphasize the significance of role performance and their ability to fulfill these duties and adapt their followership styles, which may improve or impede military effectiveness. The finding supports Kim's (2011) previous findings regarding the relationship between followership style and job category among federal employees in the United States, which were attributed to responsibility, authority, organizational culture, and expectations from individuals holding the position.

On the other hand, the association between followership styles and leadership course completion may suggest that

individuals who have undergone leadership training are more likely to adopt certain followership styles and engage in leadership-focused learning experiences, possibly due to the training's emphasis on the importance of followers and positive attitudes towards them (NRC, 2008). Leadership training can aid military personnel in understanding different followership styles, enabling them to anticipate their leaders' needs and adapt their styles accordingly. This aligns with the social learning theory, which suggests that people learn new behaviors by observing and imitating others. In the military, leadership training provides soldiers with opportunities to observe and imitate effective leaders and followers, thereby developing the skills and behaviors necessary for effective followers. Furthermore, Hopton (2014) and Kelley (1988) argue that leadership training provides an opportunity to understand and appreciate followers' perspectives, augmenting positive leadership.

Furthermore, the no association between followership styles and most demographic characteristics (i.e., gender, age, educational attainment, years of military service, branch of service, rank, personnel category, role of unit, followership course) may seem to suggest that these demographic characteristics do not determine followership styles among the military personnel of the AFP. It

may also seem to suggest that the prevailing military culture in the AFP may play a role in reducing the salience of these factors. The military is a hierarchical organization emphasizing conformity and obedience (Collinson, 2008; Freeman, 1948; NRC, 2014). This may lead soldiers to suppress individual differences in favor of adhering to group norms, making these demographic characteristics less influential in the AFP compared to other settings. Furthermore, the findings imply that military training in the AFP should also emphasize the development of followership skills, as these skills are crucial for effective teamwork and collaboration in the modern military.

4. CONCLUSION

This study explored the potential relationship between the personality traits and followership dimensions, styles, and demographic characteristics of military personnel, as well as their followership style and personality trait profiles. The study found exemplary followers to be prevalent among military personnel while acknowledging that some individuals do not fit with Kelley's five followership styles, suggesting four additional styles. Relatedly, it found that most military personnel have "average" personality traits, indicating an overall adaptable

personality functioning that is suitable for military settings. The study concluded that there is a correlation between personality traits other than emotionality in either or both followership dimensions. Similarly, it found a relationship between personality traits other than emotionality and followership styles, with exemplary and conformist-exemplary followership styles exhibiting similar personality traits. Furthermore, it was found that only leadership course completion has a relationship with ICT, whereas none of the demographic variables have a relationship with AE. Similarly, it was found that only job categories and leadership course completion have a relationship with followership styles.

This suggests that the Philippine military, like all armed forces, is based on a followership ethos, with all ranks having a duty to follow professionally to achieve shared mission goals. With over 91% of its members being exemplary or conformist-exemplary followers, the AFP is well-positioned to maintain its high-performing status and adapt to organizational challenges. The current military personnel management system allows members to be highly involved in achieving shared goals, with personalities that can adapt to complex situations. However, cultivating a culture of "professional disagreement" is

essential to minimize moral disengagement, deindividuation, and moral rationalization among military personnel. In particular, the negative correlation between honesty-humility and ICT reveals a military culture where moral rationalization is often used to justify unacceptable actions for social order, group cohesion, and mission success.

Furthermore, effective followership styles are linked to certain personality traits, enabling individuals to follow orders, collaborate, and maintain a positive mindset. Understanding these variables can optimize military performance and lead to more effective leaders, followers, and organizations, crucial for the Philippine military's success. The Philippine military must continuously learn and develop its most valuable asset - its followers, to win against enemies and thrive in future challenges.

4.1. Directions for Future Research

To further the study of followership, the researcher proposes longitudinal research to understand followership dimensions and styles over time, cross-cultural research to compare styles across cultures, and taking organizational factors into account. Empirical data is also required to validate new followership styles, and studying followership in

both the military and civilian sectors can reveal insights into followership dynamics.

Funding Information

The authors received no financial support for the research, authorship, and/or publication of this article.

Conflict of Interest Statement

The authors have no conflict of interest to disclose.

REFERENCES

- [1] Ali, I. (2019). Personality traits, individual innovativeness, and satisfaction with life. *Journal of Innovation & Knowledge*, 4(1), 38–46.
- [2] Andrews, K., Jamshidi, L., Nisbet, J., Teckchandani, T., Afifi, T., Sauer-Zavala, S., Krätzig, G., & Carleton, R. (2023). Personality profiles of Royal Canadian mounted police cadets starting the cadet training program. *Journal of Police and Criminal Psychology*. <https://doi.org/10.1007/s11896-022-09564-0>
- [3] Ashton, M. C., & Lee, K. (2009). The HEXACO-60: A short measure of the major dimensions of personality. *Journal of Personality Assessment*, 91, 340–345.
- [4] Barrick, M. & Mount, M. (1993). Autonomy as a moderator of the relationships between the big five personality dimensions and job performance. *Journal of Applied Psychology*, 78, 111–118.

- <http://dx.doi.org/10.1037/0021-9010.78.1.111>
- [5] Bartone, P. T., Eid, J., Johnsen, B. H., Laberg, J. C., & Snook, S. A. (2009). Big five personality factors, hardiness, and social judgment as predictors of leader performance. *Leadership & Organization Development Journal*, 30(6), 498–521. <https://doi.org/10.1108/01437730910981908>
- [6] Bashiri, H., Barahmand, U., Akabri, S., Ghamari, H., & Vusugi, A. (2011). A study of the psychometric properties and the standardization of HEXACO personality inventory. *Procedia-Social and Behavioral Sciences*, 30, 1173-1176.
- [7] Bastardo, N., & van Vugt, M. (2019). The nature of followership: Evolutionary analysis and review. *The Leadership Quarterly*, 30(1), 81–95.
- [8] Bekesiene, S. (2023). Impact of personality on cadet academic and military performance within mediating role of self-efficacy. *Frontiers in Psychology Sec. Positive Psychology*, 14. <https://doi.org/10.3389/fpsyg.2023.1266236>
- [9] Berg, P. (2020). The importance of teaching followership in professional military education. *Journal of Military Education, April*, 81-87.
- [10] Berkowitz, R. (2014). Did Eichmann think? [Review of A review of Eichman before Jerusalem: The unexamined life of a mass murderer, by Bettina Stangneth]. *The Good Society*, 23(2), 193–205.
- [11] Blackshear, P. (2004). The followership continuum: A model for increasing organizational productivity. *The Innovation Journal: The Public Sector Innovation Journal*, 9(1), 1-14.
- [12] Bobdey, S., Narayan, S., Ilankumaran, M., & Pawar, A. (2021). Association of personality traits with performance in military training. *Med J Armed Forces India*, 77(4), 431-436.
- [13] Borisová, S. & Pintes, G. (2022). The relationship between critical thinking and moral reasoning in the context of the ‘philosophy for children’ programme. *EDULEARN22 Proceedings*, 6939-6943. <https://doi.org/10.21125/edulearn.2022.1634>
- [14] Breevaart, K., & de Vries, R. (2021). Followers’ HEXACO personality traits and preference for charismatic, relationship-oriented, and task-oriented leadership. *Journal of Business and Psychology*, 36, 253–265.
- [15] Brunk, G. G., Secrest, D., & Tamashiro, H. (1990). Military views of morality and war: An empirical study of the attitudes of retired American officers. *International Studies Quarterly*, 34(1), 83–109. <https://doi.org/10.2307/2600406>
- [16] Burtăverde, V., Chraif, M., Aniței, M., & Dumitru, D. (2017). The HEXACO model of personality and risky driving behavior. *Psychological reports*, 120(2), 255–270. <https://doi.org/10.1177/0033294116688890>
- [17] Carsten, M., Harms, P., & Uhl-Bien, M. (2014). Exploring historical perspectives of followership: The need for an expanded view of followers and the follower role. In L. Lapierre & M. Carsten (Eds.),

- Followership: What Is It And Why Do People Follow?* (pp. 3-26). Emerald Group Publishing Limited.
- [18] Centre for Army Leadership [CAL]. (2023). *A British army followership doctrine note*. Robertson House.
- [19] Chaleff, I. (2009). *The courageous follower: Standing up to and for our leaders* (3rd Eds.). Barrett-Koehler Publishers.
- [20] Chaleff, I. (2008). Creating new ways of following. In R. E. Riggio, I. Chaleff, & J. Lipman-Blumen (Eds.), *The Art of Followership: How Great Followers Create Great Leaders and Organizations* (pp. 67-87). Jossey-Bass.
- [21] Charness, G., & Chen, Y. (2020). Social identity, group behavior, and teams. *Annual Review of Economics*, 12, 691-713. <https://doi.org/10.1146/annurev-economics091619-032800>
- [22] Ching, C., Church, A., Katigbak, M., Reyes, J., Tanaka-Matsumi, J., Takaoka, S., Zhang, H., Shen, J., Arias, R., Rincon, B., & Ortiz, F. (2014). The manifestation of traits in everyday behavior and affect: A five-culture study. *Journal of Research in Personality*, 48, 1–16.
- [23] Collinson, D. (2008). Conformist, Resistant, and Disguised Selves. In R. E. Riggio, I. Chaleff, & J. Lipman-Blumen (Eds.), *The art of followership: How great followers create great leaders and organizations* (pp. 309-323). Jossey-Bass.
- [24] Corrothers, E. (2009). *Say no to yes men: Followership in the modern military* [Thesis, Air University]. Defense Technical Information Center. <https://apps.dtic.mil/sti/citations/ADA539460>
- [25] Crossman, B., & Crossman, J. (2011). Conceptualising followership – a review of the literature. *Leadership*, 7(4), 481–497.
- [26] Curaming, R., & Aljunied, S. (2013). On the fluidity and stability of personal memory: Jibin Arula and the Jabidah massacre in the Philippines. In K.S. Loh, S., Dobbs, & E. Koh (Eds), *Oral History in Southeast Asia: Memories and Fragments* (pp. 83-100). Palgrave Macmillan.
- [27] Davis, W. (2020). Fundamental Difference between military and civilian leadership. *ResearchGate*, 70-74.
- [28] de Jong, N., Wisse, B., Heesink J., & van der Zee, K. (2019). Personality traits and career role enactment: Career role preferences as a mediator. *Frontiers in Psychology*. DOI: 10.3389/fpsyg.2019.01720
- [29] de Vries, R. (2018). Three nightmare traits in leaders. *Frontiers in Psychology Sec. Organizational Psychology*, 9. <https://doi.org/10.3389/fpsyg.2018.00871>
- [30] de Vries, R. (2012). Personality predictors of leadership styles and the self–other agreement problem. *The Leadership Quarterly*, 23(5), 809-821.
- [31] Deale, C., Lee, J., & Schoffstall, D. (2019). Exploring followership in hospitality and tourism education. *Journal of Hospitality, Leisure, Sport & Tourism Education*, 22. 42-51.
- [32] Department of National Defense [DND]. (2014). *Standards for physical examination in the AFP* (AFPR G 165-363).

- [33] Dunham, Y. (2019). *Intellectualism among US Military Officers at the United States army command and general staff officers course* [Master's Thesis, US Army Command and General Staff College]. Defense Technical Information Center. <https://apps.dtic.mil/sti/pdfs/AD1105031.pdf>
- [34] El Othman, R., El Othman, R., Hallit, R., Obeid, S., & Hallit, S. (2020). Personality traits, emotional intelligence and decision-making styles in Lebanese universities medical students. *BMC Psychol*, 8, 46. <https://doi.org/10.1186/s40359-020-00406-4>
- [35] Eshet, Y., & Harpaz, I. (2021). Personality traits' predictors of outstanding performance in the public sector. *Public Performance & Management Review*, 44(6), 1367-1394.
- [36] Essa, E. B., & Alattari, A. (2019). The relationship between followership styles and leadership styles. *Research in Educational Administration & Leadership*, 4(2), 407-449.
- [37] Evans, C. (2020). *Measuring student success skills: A review of the literature on critical thinking*. Dover, NH: National Center for the Improvement of Educational Assessment.
- [38] Fasko, D. (1994, November). *Critical thinking and moral reasoning: Can you have one without the other?* [Conference presentation]. Mid-South Educational Research Association. Nashville, TN, United States. <https://eric.ed.gov/?id=ED391782>
- [39] Freeman, F. D. (1948). The army as a social structure. *Social Forces*, 27(1), 78-83. <https://doi.org/10.2307/2572465>
- [40] Gajdhane, A. (2023). An analysis of followership styles and their correlation with demography in Indian public sector bank. *International Journal of Creative Thoughts*, 11(7), 262-272.
- [41] Ganzemiller, K., Vo, P., Bertsch, A., Saeed, M., Ondracek, J., Pellenwessel, D., Kea, M., & Nadeau, K. (2021). Exploring preferred leadership styles across industries: perspectives of followers. *Journal of Leadership in Organizations*, 3(2), 99-121.
- [42] Gloria, G., Rufo, A., & Bagayaua-Mendoza, G. (2011). *The enemy within: An inside story on military corruption*. Public Trust Media Group Inc.
- [43] Gonzales, J. (2016). *Leadership styles in military settings and their influences on program satisfaction* [Master's Thesis, Georgia Southern University]. Electronic Theses and Dissertations. <https://digitalcommons.georgiasouthern.edu/etd/1461>
- [44] Goodwin, G., Blacksmith, N., & Coats, M. (2018). The Science of teams in the military: Contributions from over 60 years of research. *American Psychologist*, 73(4), 322-333.
- [45] Gross, R. (2019). The nexus between followership and entrepreneurial leadership: a firm-level analysis. *Journal of Management Policy & Practice*, 20(5), 18-27.
- [46] Halvorson, A. (2010). *Understanding the military: The*

Institution, the Culture, and the People. SAMHSA.

[47] Happawana, K. (2021). Towards redefining implementation of personality assessment in professional military education. *Wild Blue Yonder: Online Journal*.

[48] Henry, S., Thielmann, I., Booth, T., & Möttus, R. (2022). Test-retest reliability of the HEXACO-100—and the value of multiple measurements for assessing reliability. *PLoS ONE* 17(1): e0262465. <https://doi.org/10.1371/journal.pone.0262465>

[49] Hopton, C. (2014). Learning and developing followership. *Journal of Leadership Education*, 13(3), 129-137.

<https://doi.org/10.12806/V13/I3/I1>

[50] Ivanoska, K. S., Markovic, Z., & Sardzoska, E. (2019). The preferred leadership and followership styles of employees in state- and privately-owned organizations in Serbia and Macedonia. *Journal for East European Management Studies*, 24(2), 305–323. <https://doi.org/10.5771/0949-6181-2019-2-305>

[51] Johnson, C. (2014). Why “good” followers go “bad”: The power of moral disengagement. *Journal of Leadership Education*, 36-50.

[52] Jokić, B., & Purić, D. (2019). Relating rational and experiential thinking styles with trait emotional intelligence in broader personality space. *Europe's Journal of Psychology*, 15(1), 140–158.

[53] Kalimuddin, M. (2017). The practical application of followership theory in mission command. *Military Review Online Exclusive*, September, 2-6.

[54] Kelley, R. (1988, November). *In praise of followers*. Harvard Business Review.

[55] Kelley, R. (1992). *The power of followership: How to create leaders people want to follow and followers who lead themselves*. Doubleday.

[56] Kim, K. H., Kim, Y. J., & Lee, S. K. (2019). The relationships between personality traits, creative self-efficacy, and creative achievement in the arts. *Psychology of Aesthetics, Creativity, and the Arts*, 13(4), 461-469.

[57] Kim, C. (2011). Followership characteristics among US federal government employees. *The Korean Journal of Policy Studies*, 26(2), 101-120

[58] Kudek, D., Winston, B., Wood, J. (2020). Followership and the relationship between Kelley's followership styles and the big five factor model of personality. *Journal of Organizational Psychology*, 20(3), 102-117.

[59] Lee, Y. (2018). Nurturing critical thinking for implementation beyond the classroom: Implications from social psychological theories of behavior change. *Thinking Skills and Creativity*, 27, 139-146.

[60] Lee, K., & Ashton, M. C. (2018). Psychometric properties of the HEXACO-100. *Assessment*, 25, 543–556.

[61] Lee, K., & Ashton, M. C. (2012). *The H factor of personality*. Wilfrid Laurier University Press.

[62] LePine, J., & van Dyne, L. (2001). Voice and cooperative behavior as contrasting forms of contextual performance: Evidence of differential relationships with big five personality characteristics and

- cognitive ability. *Journal of Applied Psychology*, 86(2), 326-336.
- [63] Leung, C., Lucas, A., Brindley, P., Anderson, S., Park, J., Vergis, A., & Gillman, L. (2018). Followership: A review of the literature in healthcare and beyond. *Journal of Critical Care*, 46, 99-104.
- [64] Litzinger, W., & Schaefer, T. (1982). Leadership through followership. *Business Horizons*, 25(5), 78-81.
- [65] Machiha, M. M., & Brew, G. (2019). *Predictors of work engagement among university teachers: The role of personality and perceived organisational support*. [Master's Thesis, Linnaeus University]. Digitala Vetenskapliga Arkivet. <https://urn.kb.se/resolve?urn=urn:nbn:se:lnu:diva-84767>
- [66] Mannes, S., Beuren, I., & da Silva, E. (2022). Cooperative behavior and knowledge sharing: Interaction of risk management. *Revista Brasileira De Gestão De Negócios*, 24(4), 692-707.
- [67] Marcus, B., Te Nijenhuis, J., Cremers, M., & Heijden-Lek, K. V. D. (2016). Tests of integrity, HEXACO personality, and general mental ability, as predictors of integrity ratings in the Royal Dutch Military Police. *International Journal of Selection and Assessment*, 24, 63-70.
- [68] McGrath, D., Neilson, T., Lee, K., Rash, C., & Rad, M. (2018). Associations between the HEXACO model of personality and gambling involvement, motivations to gamble, and gambling severity in young adult gamblers. *Journal of behavioral addictions*, 7(2), 392-400. <https://doi.org/10.1556/2006.7.2018.29>
- [69] McIntyre, S., Novak, I., & Cusick, A. (2010). Consensus research priorities for cerebral palsy: a Delphi survey of consumers, researchers, and clinicians. *Developmental Medicine & Child Neurology*, 52, 270-275. <https://doi.org/10.1111/j.1469-8749.2009.03358.x>
- [70] Mohamadzadeh, Z., Mortazavi, S., Lagzian, M., & Rahimnia, F. (2015). Toward an exploration of followers' implicit followership theories of Mashhad's large organizations using a qualitative approach. *Iranian Journal of Management Studies*, 8(3), 397-419.
- [71] Morrison, D. (2007). War crimes. *Great Decisions*, 65-76.
- [72] Muchlis, N., Amir, H., Cahyani, D., Alam, R., Landu, N., Mikawati, M., Febrianti, N., Junaidin, J., & Sinaga, M. (2022). The cooperative behavior and intention to stay of nursing personnel in healthcare management. *Journal of Medicine and Life*, 15(10), 1311-1317.
- [73] Mudrack, P., & Mason, E. (2019). Moral reasoning and its connections with Machiavellianism and authoritarianism: The critical roles of index choice and utilization. *Business & Society*, 58(4), 779-812. <https://doi.org/10.1177/0007650316681556>
- [74] Mulder, L., & van Dijk, E. (2020). Moral rationalization

- contributes more strongly to escalation of unethical behavior among low moral identifiers than among high moral identifiers. *Frontiers in Psychology*, 10(2912). <https://doi.org/10.3389/fpsyg.2019.02912>
- [75] Mushonga, S., & Torrance, C. (2008). Assessing the relationship between followership and the big five factor model of personality. *Review of Business Research*, 8(6), 185-193.
- [76] National Research Council [NRC]. (2008). *Human behavior in military contexts*. The National Academies Press.
- [77] National Research Council [NRC]. (2014). *the context of military environments: an agenda for basic research on social and organizational factors relevant to small units*. The National Academies Press. <https://doi.org/10.17226/18825>
- [78] Nikolic, K. (2022). *Leadership styles in military settings and their influences on program satisfaction* [Bachelor's Thesis, Modul University]. https://www.modul.ac.at/uploads/files/Theses/Bachelor/Undergrad_2022/BSC_2022/1921002_NIKOLIC_Katarina_BSc_Thesis.pdf
- [79] Novikov, V. (2016). Followership and performance in acquisition, research and development organizations. *Emerging Leadership Journeys*, 1(9).
- [80] Ntiamoah, S. (2018). Influence of followership behaviors on employee job performance in some selected public universities in Ghana. *International Journal of Scientific and Research Publications*, 8(2), 340-352.
- [81] Nye, C. (2022). Assessing interests in the twenty-first-century workforce: Building on a century of interest measurement. *Annual Review of Organizational Psychology and Organizational Behavior*, 9, 415-440.
- [82] Ones, D. S., Viswesvaran, C., & Dilchert, S. (2005). Personality at work: Raising awareness and correcting misconceptions. *Human Performance*, 18(4), 389-404.
- [83] Osiel, M. (1998). Obeying Orders: Atrocity, military discipline, and the law of war. *California Law Review*, 86(5), 939-1129.
- [84] Oyetunji, C. (2013). The relationship between followership style and job performance in Botswana private universities. *International Education Studies*, 6(2), 179-187.
- [85] Peabody, J., Lucas, A., Ziesmann, M., & Gillman, L. (2022). A cross-sectional study evaluating the relationship between followership type and burnout amongst critical care followers. *Intensive & Critical Care Nursing*, 72, 1-5.
- [86] Peters, K., & Haslam, A. (2018, August). *To be a good leader, start by being a good follower*. Harvard Business Review.
- [87] Pina e Cunha, M., Rego, A., & Clegg, S. (2010). Obedience and evil: From Milgram and Kampuchea to normal

- organizations. *Journal of Business Ethics*, 97(2), 291–309.
- [88] Piotrowski, A., & Pękała, P. (2016). Responsibility and conscientiousness of soldiers. *Journal of Science of the Military Academy of Land Forces*, 48(4), 63-73.
- [89] Playter, K. (2022). Followers' independent critical thinking and active engagement for collocated vs. virtual work teams. *Regent Research Roundtables Proceedings*, 68-87.
- [90] Port., P. (2020). *Direct leadership under pressure: Perspective of followers*. Independently published.
- [91] Postigo, Á., Cuesta, M., García-Cueto, E., Prieto-Díez, F., & Muñiz, J. (2021). General versus specific personality traits for predicting entrepreneurship. *Personality and Individual Differences*, 182, 1-5.
- [92] Punongbayan, M. (2023, February 22). Durante, others may face service separation, jail time. *PhilStar Global*. <https://www.philstar.com/headlines/2023/02/22/2246658/durante-others-may-face-service-separation-jail-time>
- [93] Rafae, A., & Erritali, M. (2023). Using a profiling system to recommend employees to carry out a project. *Electronics*, 12(16), <http://dx.doi.org/10.3390/electronic12163388>
- [94] Ramadan, Z., Angehrn, A., Stelnicki, A., Fletcher, A., Kratzig, G., Hadjistavropoulos, H., & Carleton, R. (2022). Public safety personnel, personality, and gender. *Personality and Individual Differences*, 111583, 1-5.
- [95] Redmond, S., Wilcox, S., Campbell, S., Kim, A., Finney, K., Barr, K., & Hassan, A. (2015). A brief introduction to the military workplace culture. *Work*, 50, 9-20.
- [96] Ricketts, J. (2005). The relationship between leadership development and critical thinking skills. *Journal of Leadership Education*, 4(2), 27-41.
- [97] Ripley, A. (2019). *Examining the utility of the HEXACO-PI-R for predicting positive and negative indicators of police officer performance*. [Doctoral dissertation, Walden University]. Walden Dissertations and Doctoral Studies Collection.
- [98] Robbins, S., & Judge, T. (2013). *Essentials of organizational behavior* (15th Eds.). Pearson.
- [99] Sarsam, S., Al-Samarraie, H., & Alzahrani, A. (2021). Influence of personality traits on users' viewing behaviour. *Journal of Information Science*. <https://doi.org/10.1177/0165551521998051>
- [100] Ścigała, K., Arkoudi, I., Schild, C., Pfattheicher, S., & Zettler, I. (2023). The relation between honesty-humility and moral concerns as expressed in language, *Journal of Research in Personality*, 103(104351). <https://doi.org/10.1016/j.jrp.2023.104351>
- [101] Sefidan, S., Pramstaller, M., La Marca, R., Wyss, T., Roos, L., Sadeghi-Bahmani, D., Annen, H., &

- Brand, S. (2021). Transformational Leadership, Achievement Motivation, and Perceived Stress in Basic Military training: A longitudinal study of swiss armed forces. *Sustainability*, 13(24). <https://doi.org/10.3390/su132413949>
- [102] Semrad, M., & Scott-Parker, B. (2020). Police, personality, and the ability to deceive. *International Journal of Police Science and Management*, 22(1), 50–61.
- [103] Sharma, T., & Tripathi, K. (2023). Relationship between the personality traits and creativity style among college students. *The International Journal of Indian Psychology*, 11(3), 1130-1145.
- [104] Siegel, E. (2016) *Predictive analytics: The power to predict who will click, buy, lie or die*. John Wiley & Sons Inc.
- [105] Singh, A. (2009). Personality traits as predictor of leadership effectiveness among IT professionals. *Indian Journal of Social Science Researches*, 6(2), 57-62.
- [106] Singh, T., & Kaushik, S. (2015). A study of creativity in relation to big 5 personality traits. *The International Journal of Indian Psychology*, 3(1), 124-128.
- [107] Skoglund, T., Brekke, T., Steder, F., & Boe, O. (2020). Big five personality profiles in the Norwegian special operations forces. *Frontiers in Psychology*, 11:747. <https://doi.org/10.3389/fpsyg.2020.00747>
- [108] Tahrir, Nurdin, F., & Damayanti, I. (2020). The role of critical thinking as a mediator variable in the effect of internal locus of control on moral disengagement. *International Journal of Instruction*, 13(1), 17-34.
- [109] Taylor, J. C., & Hill, D. (2017). Leading through following: Understanding the intersection of followership, leadership and collaboration. *School Leadership Review*, 12(2), 32–38.
- [110] Thomas, T., & Berg, P. (2014). Followership: Exercising discretion. *Journal of Leadership Education*, 13(4). <https://doi.org/10.12806/V13/14/C5>
- [111] Uhl-Bien, M., Riggio, R., Lowe, K., & Carsten, M. (2014). Followership theory: A review and research agenda. *The Leadership Quarterly*, 25. 83–104.
- [112] United States Military Academy. (2018). *The west point leader development system*. <https://www.westpoint.edu/sites/default/files/pdfs/ABOUT/Superintendent/Developing%20Leaders%20of%20Character%202018.pdf>
- [113] Urooj, U., Yasmeen, R., Khan, N.-U.-S., Qamar, K., Iqbal, R., & Khalil, H. (2020). “There’s only one king and you are not him” followership styles of medical residents in Pakistan. *Pakistan Armed Forces Medical Journal*, 70(2), 362–367.
- [114] Voss, N., & Ryseff, J. (2022). *Comparing the organizational cultures of the department of defense and Silicon Valley*. RAND Corporation.

STRATEGIES FOR ENHANCING MILITARY LEADERSHIP: A CASE STUDY OF VUCA PRIME IN THE COLOMBIAN AEROSPACE FORCE

Maribel Silva BARRERA

Colombian Armed Forces, Colombia

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 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.

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 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 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]

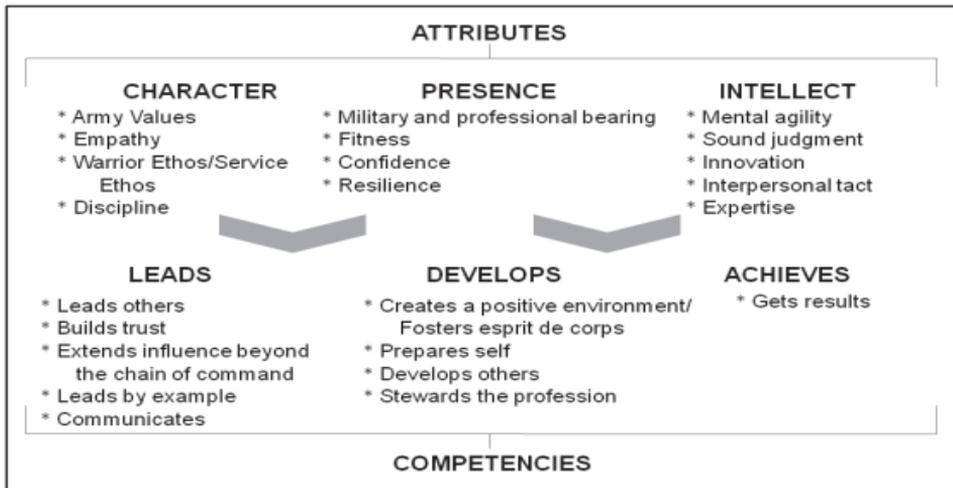


Fig. 1 Army Leader Requirements Model (ALRM) [14]

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 study are presented in Figure 2.

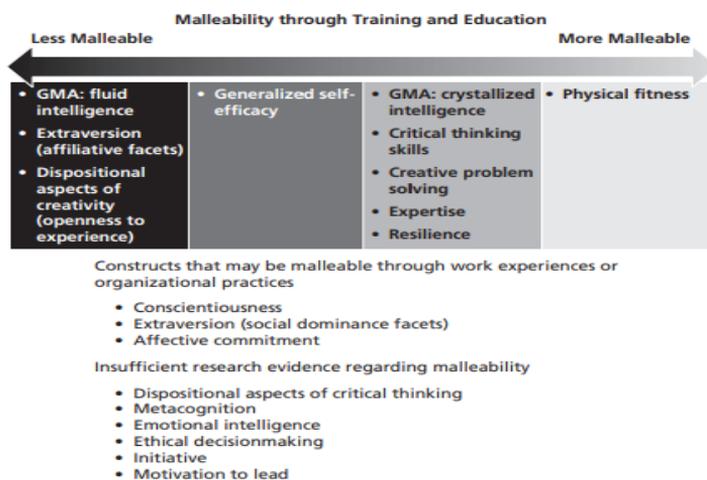


Fig. 2 Degree of Malleability of ALRM Constructs [15]

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 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 SIIO, 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 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 3, 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.



Fig. 3 Process Map Colombian Aerospace Force [17]

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 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.

REFERENCES

- [1] Meri, M. *The VUCA Method for Leadership & Management in Times of Crisis – Ex. Covid- 19* (Adaptation, performance, and development). DOI: 10.14738/eb.167.2021. Services for Science and Education Stockport, Cheshire, SK4 2BT United Kingdom. 2021.
- [2] Bennett, N., Lemoine, G. J. *What VUCA really means for you*. Harvard business review. 92. 2014.
- [3] Codreanu, Aura. *A VUCA Action Framework for A VUCA Environment*. Leadership Challenges and Solutions. Journal of Defense Resources Management Studies. 7. 31-38. 2016
- [4] Mackey, Richard. *TRANSLATING VISION into REALITY: THE ROLE OF THE STRATEGIC LEADER*. US Army War College. 1992
- [5] Oficina de las Naciones Unidas contra la Droga y el Delito. *Monitoreo de territorios afectados por cultivos ilícitos 2022*. Retrieved from https://www.unodc.org/documents/crop-monitoring/Colombia/Colombia_Monitoreo_2022.pdf. September 2023
- [6] Colombian Air Force. *Strategy for the Air and Space Development of the Colombian Air Force 2042*. Retrieved from: <https://www.fac.mil.co/es/edaesfac2042> . , 2021.

- [7] Clausewitz, Carl von. *De la Guerra*, edition directed and translated by Michael Howard and Peter Paret, Edited in Spanish by the Ministry of Defense of Spain, Ed 1999, pages 209 to 226, 249. 1999
- [8] Browne, James S. *Air Force Leadership Development: Transformation's Constant*. Air University Press Maxwell AFB, AL 36112-6615, 2003
- [9] Colombian Air Force. *Commander's Guide*. Bogota, Colombia. 2015
- [10] Ausburn, Lynna & Ausburn, Floyd. *Technical Perspectives on Theory in Screen-Based Virtual Reality Environments: Leading From the Future in VHRD*. Advances in Developing Human Resources. 16. 371-390. 10.1177/1523422314532125. 2014.
- [11] Hesselbein, F., Goldsmith, M., & Beckhard, R. *The leader of the future: new visions, strategies, and practices for the next era*. San Francisco, Jossey-Bass. 1996.
- [12] Browne, James S. *Air Force Leadership Development: Transformation's Constant*. Air University Press Maxwell AFB, AL 36112-6615. 2003
- [13] Rahaman, Andrew. *The Art And Science Of Leadership*. Forbes. Retrieved from: <https://www.forbes.com/sites/forbesbusinesscouncil/2023/07/14/the-art-and-science-of-leadership/>. 2023.
- [14] Headquarters, Department of the Army. *Army Leadership*, ADRP 6-22, C1, Washington, D.C.: September 2012b.
- [15] Straus, Susan G., Tracy C. Krueger, Geoffrey E. Grimm, and Katheryn Giglio. *Malleability and Measurement of Army Leader Attributes: Personnel Development in the U.S. Army*, RAND Corporation, RR-1583-A, Retrieved from: https://www.rand.org/pubs/research_reports/RR1583.html. 2018.
- [16] Czerwinski, Alberts. *Complexity, global politics, and national security*. Washington, DC: National Defense University. Retrieved from: <https://apps.dtic.mil/sti/citations/ADA460550>. 1997.
- [16] Dowdy, John, Rieckhoff, Kirk. *Agility in U.S. National Security*. Retrieved from: <https://www.mckinsey.de/~media/McKinsey/Industries/Public%20and%20Social%20Sector/Our%20Insights/Agility%20in%20US%20national%20security/Agility-in-US-national-security.pdf>, Mar. 2017.
- [17] Colombian Aerospace Force. *Process Map Colombian Aerospace Force*. Retrieved from <https://www.fac.mil.co/sites/default/files/linktransparencia/Planeacion/Procesos/Mapa%20de%20Procesos%20y%20Procedimientos%20Fuerza%20A%C3%A9rea%20Colombiana%202021.pdf>. 2020.
- [18] Colombian Aerospace Force. *Strategic Plan Human Talent*. Retrieved From <https://www.fac.mil.co/sites/default/files/linktransparencia/Planeacion/Planes/planes2022/PLAN ESTRATEGICO TALENTO HUMANO 2022.pdf>. 2022.

EMPOWERING OF DEFENSE RESOURCES TO SUPPORT THE INDONESIAN ARMED FORCES' (TNI)TASKS IN MAINTAINING REGIONAL STABILITY

Ali SETIANDY*, A.K. SUSILO, ISKANDAR***, Inong SOFIARINI******

* Indonesian Military's Staff and Command College, Lengkong, Bandung, Indonesia 40264

**Indonesia Naval Technology College, Morokrembangan, Surabaya, Indonesia 60178

***Aceh Regional Secretariat, Syah Kuala, Banda Aceh, Indonesia 23114

****Development Planning Agency, Banda Sakti, North Aceh, Aceh, Indonesia 24351

Indonesia's geographic location and position with its sovereign rights and territorial sovereignty from land, sea, and air geopolitically and geostrategically has a form of high vulnerability from traditional and non-traditional threats in violations of maritime territory and regional stability. This research aims to provide an analysis of defense resource empowerment strategies to support the Indonesia Armed Forces (TNI) main tasks in maintaining regional stability. this research is supported by the resource theory, defense theory, and stability theory approaches. The method used is qualitative descriptive statistics supported by SWOT analysis and analytical hierarchy process (AHP). Based on the results of the SWOT analysis, there are 15 internal factors in the form of strengths and 20 external factors in the form of opportunities. Of the 15 sub-items, the sub-item Foreign policy system, free and active from political aspects, is the most influential with a weight of 0.08. Meanwhile, for the obstacle/threat factor, there were 20 sub-items. The results of the SWOT and AHP analysis show that the steps for optimizing defense resources to support the main task of the TNI in resolving territorial violations are a diversification strategy, namely empowering all national resource forces for defense in resolving threats/obstacles.

Key Words: *Defense Resource, Regional Stability, Indonesia Armed Forces (TNI), SWOT analysis, analytical hierarchy process (AHP)*

1. INTRODUCTION

Indonesia's geographic location and position with its sovereign rights

and territorial sovereignty from land, sea, and air geopolitically and geostrategically has a form of high vulnerability from traditional and

non-traditional threats in violations of maritime territory and regional stability. Indonesia is one of the countries that claims part of the South China Sea as part of the Exclusive Economic Zone (EEZ) [1], [2]. However, several other countries, including China, also claim parts of the same territory, resulting in overlapping claims and territorial boundary disputes. Maritime territorial violations against Indonesia in the South China Sea remain a controversial issue that requires continuous attention and diplomatic efforts to resolve it [3], [4], of course the Indonesian Armed Forces (TNI) which is mandated by the constitution and legislation to safeguard sovereignty and the territorial integrity of the Archipelagic State of the Republic of Indonesia (NKRI) plays an important role in empowering resources for defense [5].

The TNI is responsible for maintaining security and order throughout Indonesia [6], including handling territorial violations that occur at the border or sea. However, the current conditions are still not optimal in empowering defense resources to support the TNI's main task of resolving maritime territorial violations to maintain regional stability in the South China Sea [7]. Policy-making stakeholders are faced with the difficult problem of empowering defense resources to

support the main tasks of the TNI [8]. This can cause obstacles to defense resource empowerment programs that should be implemented. Appropriate and measurable concepts and efforts can help improve the country's defense capabilities in resolving territorial violations and maintaining regional stability in the South China Sea. Therefore, it is necessary to empower defense resources to support the TNI's main duties in maintaining regional stability.

This research aims to provide an analysis of defense resource empowerment strategies to support the TNI's main tasks in maintaining regional stability. This is important because of the important role of a military that has good equipment and capabilities in ensuring national security and maintaining regional peace. Second, by exploring and implementing effective defense resource empowerment strategies, the TNI can optimize its resources, increase operational readiness, and contribute to regional stability. Third, there is a need to research defense resource empowerment strategies that can provide the TNI with the tools and capabilities needed to overcome these challenges.

In the analysis, this research is supported by the resource theory, defense theory, and stability theory approaches. The method used is qualitative descriptive statistics

supported by SWOT analysis and analytical hierarchy process (AHP). This research used several expert panels consisting of six practitioners and academics who collected data via Google Forms. Documentation takes the form of collecting data such as pictures, photographs, and documents related to research.

This research makes several contributions. First, research on defense resource empowerment strategies provides valuable insight into optimizing resource allocation within the TNI. This involves identifying priority areas for investment, such as equipment and infrastructure modernization, training and education programs, and logistics management. Second, research on defense resource empowerment strategies contributes to the identification and adoption of cutting-edge technology that can increase the TNI's capabilities. This includes research on emerging technologies such as artificial intelligence, cyber defense systems, unmanned aerial vehicles (UAVs), advanced communications systems, and surveillance technologies. Third, Research helps identify best practices in recruiting, training methodology, leadership development, and talent retention.

2. LITERATURE REVIEW

2.1. Resource theory

Resource theory is a management concept that suggests that a company's resources and capabilities are the main drivers of its competitive advantage and long-term success [9]. According to Barney, resources can also be referred to as anything that is seen to have economic value and is useful for human needs. The productivity of humans who produce, exchange, and manage technology and resources is critical to the competitiveness of a company or organization. resources must meet four criteria to be considered valuable, rare, inimitable, and non-substitutable [10].

The first criterion is value. Resources must be able to help the company exploit external opportunities or neutralize external threats. In other words, it must be able to contribute to company performance. For example, a company's strong brand reputation can help it attract more customers and increase sales. The second criterion is rarity. The resource must be unique or rare relative to its competitors. If every company in an industry has access to the same resources, it cannot provide a competitive advantage. For example, access to certain natural resources can give a company a competitive advantage otherwise unavailable to its

competitors. The third criterion is inimitability. The resource must be difficult or expensive for competitors to imitate or replicate. If competitors can easily copy a valuable and rare resource, it cannot provide a sustainable competitive advantage. For example, a company's proprietary technology can provide an advantage if it is difficult for competitors to imitate. The fourth criterion is that it cannot be replaced. Resources must not have strategically equivalent substitutes. If competitors can use alternative resources to achieve similar results, the original resources cannot provide a sustainable competitive advantage. For example, a company's unique distribution network may provide an advantage if there are no other ways for competitors to reach the same customers.

Barney argues that resources that meet all four VRIN criteria are the most likely source of sustainable competitive advantage. However, he also noted that these resources are rare and difficult to obtain. Therefore, companies or organizations must carefully evaluate their resources and capabilities in making strategic decisions about how best to utilize them. One resource management approach is to focus on developing or acquiring resources that meet the VRIN criteria (Valuable, Rare, Inimitable, and Nonsubstitutable) [11].

2.2. Theory of Defense

Defense is an action or effort to protect oneself, a group, or a country from possible threats or attacks, which of course includes various aspects such as military strategy, national security, and foreign policy [12]. Defense theory is a branch of psychology that focuses on how individuals protect themselves from psychological threats. According to Phebe Cramer, a leading defense theorist, defense mechanisms are subconscious psychological strategies that people use to cope with anxiety and maintain self-esteem [13]. These mechanisms can be adaptive or maladaptive, depending on how effectively they help individuals manage their emotions. Cramer identified several major defense mechanisms, including repression, denial, projection, displacement, sublimation, and reaction formation. Repression involves pushing unwanted thoughts or feelings out of consciousness. Denial involves refusing to acknowledge that a problem or threat exists. Projection involves attributing one's unacceptable thoughts or feelings to another person. Displacement involves shifting one's emotions from a threatening target to a less threatening target. Sublimation involves channeling unacceptable impulses into socially acceptable activities. Reaction formation

involves expressing the opposite of one's true feelings to avoid anxiety.

Cramer argued that defense mechanisms serve several important functions. They help individuals manage anxiety by reducing the intensity of threatening emotions [13]. They also help individuals maintain self-esteem by protecting them from negative feedback or criticism. Additionally, defense mechanisms can help individuals adapt to challenging situations by allowing them to focus on the positive aspects of their experiences. However, defense mechanisms can also have negative consequences if overused or used inappropriately. For example, repression can lead to unresolved emotional conflict and psychological distress. Denial can prevent individuals from seeking help for serious problems such as addiction or mental illness. Projection can damage relationships by causing individuals to attribute their negative qualities to others. Displacement can result in inappropriate or destructive behavior towards innocent targets. Sublimation can cause obsessive or compulsive behavior that interferes with daily functioning. The formation of reactions can lead to hypocrisy or intolerance towards others who express different beliefs or values.

According to Cramer, there are seven basic principles regarding

defense [13]. These include (1) defense functions outside consciousness; (2) there is a chronology of defense development; (3) defenses are present in normal personality; (4) defense use increases under stressful conditions; (5) the use of defenses reduces the conscious experience of negative emotions; (6) defense function related to the autonomic nervous system; (7) excessive use of defense is associated with psychopathology. Defense theory also includes military strategies such as asymmetric warfare and total war. Asymmetric warfare involves the use of unconventional tactics against a larger enemy force. Meanwhile, total war involves using all the country's resources to win the war.

3. METHOD

This research uses a qualitative descriptive statistical method approach. Descriptive statistical qualitative research design is a research design at different times and sequentially starting with qualitative data collection first, then continuing with quantitative collection [14], [15]. Qualitative data is used to identify variables in the analysis of internal and external factors in SWOT, while statistical data is used to identify AHP-based empowerment strategies. Next, descriptive statistical data to present the statistics

obtained and the percentage of each variable weight from the Saaty scale. Data was taken from several expert panels with predetermined criteria. The research location was carried out in the North Natuna region which is associated with several threats to sovereignty and territorial violations.

3.1. SWOT Analysis

SWOT stands for Strengths, Weaknesses, Opportunities, and Threats analysis, which is a commonly used tool to analyze the internal and external environment to achieve a systematic approach and support for decision-making situations [16]. The internal and external factors that are most important for a company's future are referred to as strategic factors and are summarized in a SWOT analysis. The ultimate goal of the strategic planning process, of which SWOT is the initial stage, is to develop and adopt strategies that produce a match between internal and external factors. SWOT can also be used when strategic alternatives appear suddenly and the relevant decision context must be analyzed [17].

SWOT analysis can be used in many ways such as team building. There are ten ways to apply SWOT. The first step is to consider the use of SWOT. This will help in the analysis if you know in advance how and where it will be carried out. The next step is to prepare a model that has

four parts, namely strengths, weaknesses, opportunities, and threats. When studying SWOT, SW can be seen as an internal factor and OT as an external factor [18].

Table 1. SWOT Matrix.

Internal/External Factor	Strength (S) (Maximal)	Weaknesses (W) (Minimal)
Opportunity (O) (Maximal)	S-O Strategy (Maximal-Maximal)	W-O Strategy (Minimal-Maximal)
Threats (T) (Minimal)	S-T Strategy (Maximal-Minimal)	W-T Strategy (Minimal-Minimal)

3.2. Analytical Hierarchy Process (AHP)

AHP is a powerful mathematical approach that helps solve complex decision problems by decomposing them into multiple criteria in a hierarchical structure. It is based on a relative pairwise comparison matrix to prioritize criteria in a particular decision-making situation. AHP has several advantages when compared to other multi-criteria decision-making techniques. This includes (1) the technique is not complicated because it is easier to compare criteria in pairs than to compare criteria all at once. It also has a good mathematical basis, (2) it is simple and straightforward and breaks down the problem into several elements, which helps the problem be assessed separately, 3) AHP uses weighting

factors for its criteria; this provides flexibility because the weighted factors can be modified to reflect changing priorities, and (4) it also provides a transparent and measurable way to assess various options/criteria [19]. One of the main advantages of AHP that differentiates it from other decision-making models is the absence of absolute consistency requirements. So that existing problems can be felt and observed, but the completeness of numerical data does not support quantitative problem modeling [20].

Humans can instinctively estimate simple quantities through their senses. The easiest process is to

compare two things with reliable comparison accuracy. For this reason, Saaty established a quantitative scale of 1 to 9 to assess the comparative importance of other elements. 7 pillars are used and must be considered in AHP modeling, including [21], [22]: The ratio scale is a comparison of two values (a/b) where the values a and b are of the same type (units); 2) Pairwise comparison; 3) Eigenvector sensitivity conditions; 4) Homogeneity and grouping; 5) Synthesis; 6) Maintaining and reversing the order of weight and order in the hierarchy; 7) Group considerations.

Table 2. AHP Rating Scale.

Scale of Interest	Definition	Explanation
1	Equal Important	The two activities contribute equally strongly to the goal
3	Moderate Important	One activity is slightly more important than the other
5	Strong Important	One activity is more important than the other activity
7	Very Strong Important	One activity is very important compared to other activities
9	Extreme Important	One activity is very important compared to other activities
2, 4, 6, 8	Intermediate Values	
Reciprocal	Describes the dominance of the second alternative compared to the first alternative	

Table 3. Random Consistency Index Value.

1	2	3	4	5	6	7	8	9	10
0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49

3.3. Conceptual framework.

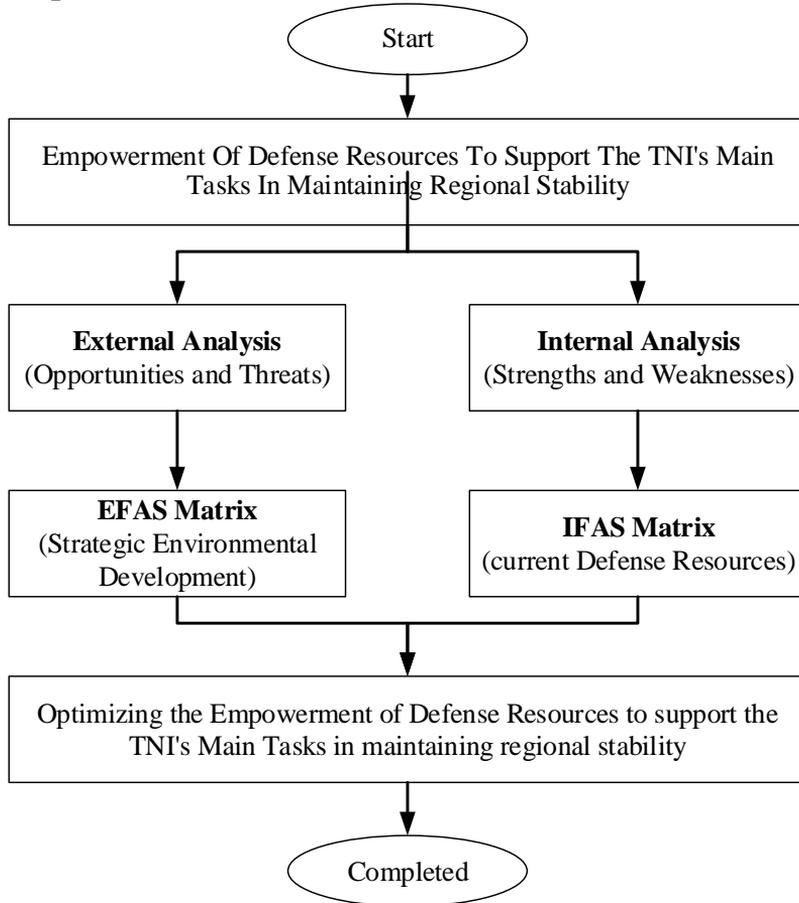


Fig. 1. Conceptual framework in research.

Empowering defense resources to support the TNI's main tasks in resolving maritime territorial violations begins with identifying current conditions in terms of two factors using a SWOT and AHP analysis approach. Next, identify influencing factors, namely internal

and external factors. Internal factors are related to current conditions in terms of strengths and weaknesses. External factors are related to the strategic environment from the aspects of opportunities and threats/constraints. Third, compile the IFAS and EFAS matrices from

each variable obtained. The variables obtained were weighted using the AHP method and a Likert scale questionnaire with six expert personnel. Fourth, develop a development strategy from the weighting results by identifying strategy quadrants (SO, ST, WO, WT).

4. RESULT

Various field research activities can be carried out safely and smoothly by the planned agenda. Based on the list of questions prepared, data collection activities have been carried out. Some of the data that has been received and collected, both through interviews

and Google forms accompanied by photos, it can be used as input material in the process of writing individual papers related to optimizing the empowerment of defense resources to support the main tasks of the TNI in resolving maritime territorial violations to protect regional stability in the South China Sea. From the initial analysis, it can be said that the data that has been received and collected is considered quite limited to the need to answer various problems.

After conducting field research, conclusions can be obtained from the results of the analysis from field research carried out using interview methods and Google forms, including the following:

Table 4. Results of internal factor analysis.

INFLUENCE ASPECTS	Strength	Weakness
Human Resources (S1/W1)	<ul style="list-style-type: none"> - Abundant workforce (S1-1). - Professional and knowledgeable military (S1-2) - A young, technologically literate workforce (S1-3). - Have a mentality and attitude of love for the homeland and nation (S1-4) 	<ul style="list-style-type: none"> - Workforce Skills Gap (W1-1) - Inadequate investment in education and training (W1-2). - Incompatibility with Defense Needs and Technology (W1-3) - Fragmented HR Policies and Programs (W1-4)
Natural resources (S2/W2)	<ul style="list-style-type: none"> - Abundance of minerals and metals (S2-1). - Wide biodiversity (S2-2). - Considerable maritime resources (S2-3). - Abundant renewable energy resources (S2-4). 	<ul style="list-style-type: none"> - Lack of assessment of natural resources relevant to defense needs (W2-1). - Limited research and development (W2-2) - Lack of synchronization with the defense industry (W2-3) - Fragmented supply chain (W2-4)

Artificial Resources (S3/W3)	<ul style="list-style-type: none"> - Government policy in infrastructure development (S3-1). - Adequate defense industry (S3-2) - Quite good technological development (S3-3). 	<ul style="list-style-type: none"> - there is no comprehensive system or database yet (W3-1). - Inhibition of appropriate allocation of artificial resources (W3-2) - Artificial resource development is not yet in sync with the defense system (W3-3)
Defense Facilities and Infrastructure (S4/W4)	<ul style="list-style-type: none"> - Has quite a lot of infrastructure network (S4-1). - Sea and air base facilities (S4-2) - There are R&D facilities (S4-3) - Extensive communications network and cyber-infrastructure (S4-4) 	<ul style="list-style-type: none"> - Inadequate infrastructure (W4-1) - There is fragmentation and overlap in facilities and infrastructure (W4-2). - limited data accessibility, in use of technology (W4-3)

Second analysis, calculation, and weighting of internal factors from aspects of strengths and weaknesses. Weighting was carried out using the AHP method from three experts.

Table 5. Results of weighting and assessment of internal factors (Strength).

Internal Strategy Factors				Weight	Total weight	Rating	Value
S	Strength						
	Human Resources	0.455	Abundant workforce	0.239	0.109	4	0.436
			Professional and knowledgeable military	0.295	0.134	4	0.537
			A young, technologically literate workforce	0.254	0.115	4	0.462
			Have a mentality and attitude of love for the homeland and nation	0.212	0.096	4	0.385

	Natural resources	0.263	Abundance of minerals and metals	0.204	0.054	4	0.215
			Wide biodiversity	0.204	0.054	5	0.269
			Considerable maritime resources	0.346	0.091	5	0.455
			Abundant renewable energy resources	0.246	0.065	4	0.259
	Artificial Resources	0.141	Government policy in infrastructure development	0.333	0.047	3	0.141
			Adequate defense industry	0.333	0.047	4	0.188
			Quite good technological development	0.333	0.047	5	0.235
	Defense Facilities and Infrastructure	0.141	Has quite a lot of infrastructure network	0.207	0.029	3	0.087
			Sea and air base facilities	0.385	0.054	4	0.218
			There are R&D facilities	0.238	0.034	4	0.134
			Extensive communications network and cyber-infrastructure	0.170	0.024	4	0.096
Total					1.000		4.116

Table 6. Results of weighting and assessment of internal factors (Weaknesses)

W	Weakness						
	Human Resources	0.455	Workforce Skills Gap	0.169	0.077	3	0.231
			Inadequate investment in education and training	0.239	0.109	4	0.434
			Incompatibility with Defense Needs and Technology	0.197	0.090	3	0.269
			Fragmented HR Policies and Programs	0.394	0.179	3	0.538

	Natural resources	0.263	Lack of assessment of natural resources relevant to defense needs	0.239	0.063	4	0.251
			Limited research and development	0.169	0.045	5	0.223
			Lack of synchronization with the defense industry	0.394	0.104	4	0.415
			Fragmented supply chain	0.197	0.052	4	0.208
	Artificial Resources	0.141	There is no comprehensive system or database yet	0.312	0.044	4	0.176
			Inhibition of appropriate allocation of artificial resources	0.198	0.028	4	0.112
			Artificial resource development is not yet in sync with the defense system	0.490	0.069	4	0.277
	Defense Facilities and Infrastructure	0.141	Inadequate infrastructure	0.261	0.037	3	0.111
			There is fragmentation and overlap in facilities and infrastructure	0.411	0.058	4	0.232
			Limited data accessibility, in use of technology	0.328	0.046	3	0.139
Total					1.000		3.615

Based on the results of the SWOT analysis obtained from four categories (Human Resources, Natural Resources, Artificial Resources, Facilities and Infrastructure), there are 15 internal factors in the form of strengths. Of the 15 sub-items, the professional military sub-item on HR aspects is the most influential with a weight of 0.134. Meanwhile, for weaknesses, there were 14 sub-items. The

fragmented sub-items of HR policies and programs are the most influential with a weight of 0.179.

The third analysis is related to internal factors in the form of opportunities and obstacles/threats which are viewed from six aspects, namely Politics, Economy, Socio-Culture, Technology, Environment, and Law using a SWOT (Strength, Weakness, Opportunity, Threat) analysis approach. In this section, the

SWOT analysis approach carried out is OT (Opportunities and Threats).

Table 7. Results of external factor analysis.

Aspect	Opportunities	Threat
Politics (O1/T1)	<ul style="list-style-type: none"> - Free and active foreign policy system (O1-1) - Political support from the Indonesian government and ASEAN countries (O1-2) - Indonesia's active participation in international forums (O1-3) 	<ul style="list-style-type: none"> - Minimal parliamentary support (T1-1) - Weakness of our diplomacy in international forums (T1-2) - Lack of continuity of leadership policies (T1-3) - Political intervention from major countries (T1-4)
Economic (O2/T2)	<ul style="list-style-type: none"> - People's economy is not affected much if there is an embargo from another country (O2-1) - Utilization of natural resources located around the LCS will increase community welfare and improve the government's economy (O2-2) - TNI can increase national fisheries capacity and make a positive contribution to the Indonesian economy (O2-3) - The energy sector also has great potential in the South China Sea region (O2-4) 	<ul style="list-style-type: none"> - Economic inequality in border areas (T2-1) - World crisis which causes limited TNI budget support (T2-2) - Decreased investment due to LCS conflict (T2-3)
Socio-Cultural (O3/T3)	<ul style="list-style-type: none"> - Cultural exchange and impact on society to improve themselves through higher education (O3-1) - Has a high regional spirit and nationalism (O3-2). - The motto Bhinneka Tunggal Ika (O3-3). - Utilizing local wisdom and culture of local communities to obtain the information needed (O3-4) 	<ul style="list-style-type: none"> - The presence of foreign cultural influences (T3-1) - Social inequality of border residents (T3-2) - Language limitations can also be an obstacle in conflict resolution efforts (T3-3)
Technology (O4/T4)	<ul style="list-style-type: none"> - There is a technological competition in the region to support our respective 	<ul style="list-style-type: none"> - Slow technological improvements implemented by the Government regarding

	<p>defenses so that we will learn and modernize our forces to prepare for conflict, therefore TNI equipment technology will be more modern and advanced (O4-1)</p> <ul style="list-style-type: none"> - Drone technology monitors ship activities (O4-2) - Data processing technology can also be used to support the main tasks of the TNI in resolving maritime territorial violations in the South China Sea area (O4-3) 	<p>TNI weapons and defense equipment (T4-1)</p> <ul style="list-style-type: none"> - Threat of technology dependency (T4-2) - Cybersecurity threats (T4-3)
<p>Environment (O5/T5)</p>	<ul style="list-style-type: none"> - Environmental aspects in border areas will result in the development of good facilities and infrastructure (O5-1) - Environmentally friendly technology planning (O5-2) - Increased cooperation with environmental institutions (O5-3) 	<ul style="list-style-type: none"> - The vast maritime environment as an entry point for crime (T5-1) - Human activities (overfishing, industrial and domestic waste disposal, and oil and gas exploration) can cause significant environmental damage (T5-2) - Other obstacles such as bad weather, strong sea currents, and geographical conditions that are difficult for patrol ships to reach (T5-3).
<p>Legal/Law (O6/T6)</p>	<ul style="list-style-type: none"> - Actions by National and International laws (O6-1) - Issuance of regulations and legislation to accommodate defense and security interests (O6-2) - There are also bilateral and multilateral agreements between countries in the South China Sea region (O6-3) 	<ul style="list-style-type: none"> - Differences in interpretation of international law (T6-) - Application of the law does not comply with applicable regulations (T6-2) - Lack of coordination and cooperation between institutions (T6-3) - Illegal activities are still high (T6-4)

Fourth analysis, calculation, and weighting of external factors from the aspect of opportunities and threats. Weighting was carried out using the AHP method from three experts.

Table 8. Results of weighting and assessment of external factors (Opportunities).

No	External Strategy Factors			Local Weight	Total weight	Rating	Value
O	Opportunities						
	Politics	0.194	Free and active foreign policy system	0.411	0.080	5	0.399
			Political support from the Indonesian government and ASEAN countries	0.261	0.051	3	0.152
			Indonesia's active participation in international forums	0.328	0.064	3	0.191
	Economic	0.215	People's economy	0.181	0.039	4	0.155
			Utilization of natural resources located around the SCS	0.236	0.051	4	0.203
			TNI can increase national fisheries capacity and make a positive contribution	0.236	0.051	3	0.152
			The energy sector also has great potential	0.347	0.075	4	0.298
	Socio-Culture	0.156	Cultural exchange	0.165	0.026	3	0.077
			Has a high regional spirit and nationalism	0.279	0.044	3	0.131
			The motto Bhinneka Tunggal Ika	0.392	0.061	3	0.183
			Utilizing local wisdom and culture of local communities	0.165	0.026	3	0.077
	Technology	0.215	There is a technological competition in the region	0.411	0.088	3	0.265
			Drone technology monitors ship activities	0.261	0.056	4	0.224

			Data processing technology	0.328	0.070	3	0.211
	Environment	0.098	the development of good facilities and infrastructure	0.261	0.025	4	0.102
			Environmentally friendly technology planning	0.328	0.032	5	0.160
			Increased cooperation with environmental institutions	0.411	0.040	5	0.201
	Legal/Law	0.123	Actions by National and International laws	0.261	0.032	4	0.128
			Issuance of regulations and legislation to accommodate defense and security interests	0.411	0.050	4	0.202
			There are also bilateral and multilateral agreements between countries	0.328	0.040	3	0.121
Total					1.000		3.632

Table 9. Results of weighting and assessment of external factors (Threat).

T	Threat						
	Politics	0.194	Minimal parliamentary support	0.200	0.039	3	0.117
			Weakness of our diplomacy in international forums	0.142	0.028	3	0.083
			Lack of continuity of leadership policies	0.329	0.064	5	0.319
			Political intervention from major countries	0.329	0.064	4	0.255
	Economic	0.215	Economic inequality in border areas	0.490	0.105	4	0.422

			World crisis which causes limited TNI budget support	0.312	0.067	4	0.268
			Decreased investment due to SCS conflict	0.198	0.042	3	0.127
	Socio-Culture	0.156	The presence of foreign cultural influences	0.411	0.064	2	0.128
			Social inequality of border residents	0.328	0.051	4	0.204
			Language limitations can also be an obstacle in conflict resolution efforts	0.261	0.041	4	0.163
	Technology	0.215	Slow technological improvements	0.261	0.056	2	0.112
			Threat of technology dependency	0.328	0.070	4	0.282
			Cybersecurity threats	0.411	0.088	4	0.353
	Environment	0.098	The vast maritime environment as an entry point for crime	0.411	0.040	3	0.120
			Human activities can cause significant environmental damage	0.328	0.032	3	0.096
			Other obstacles such as bad weather, strong sea currents, and geographical conditions that are difficult for patrol ships to reach	0.261	0.025	3	0.076
	Legal/Law	0.123	Differences in interpretation of international law	0.242	0.030	5	0.148
			Application of the law does not comply with applicable regulations	0.287	0.035	4	0.141
			Lack of coordination and cooperation between institutions	0.335	0.041	5	0.206
			Illegal activities are still high	0.136	0.017	4	0.067
Total					1.000		3.688

Based on the results of the SWOT analysis obtained from six categories (Politics, Economy, Socio-Culture, Technology, Legal Environment), there are 20 external factors in the form of opportunities. Of the 15 sub-items, the sub-item Foreign policy system, free and active from political aspects, is the most influential with a weight of 0.08. Meanwhile, for the obstacle/threat factor, there were 20

sub-items. The sub-item of economic inequality in border areas, the economic aspect, is the most influential with a weight of 0.105. Based on the results of the IFAS and EFAS Matrix analysis, a strategy development model was obtained consisting of SO strategy, ST strategy, WO strategy, and WT strategy. From the strategy study, such as:

Table 10. Determination of internal and external factor analysis quadrants.

S	W	Quadrant	Axis
4.116	3.615	0.500	X
O	T	Quadrant	Axis
3.632	3.688	-0.056	Y

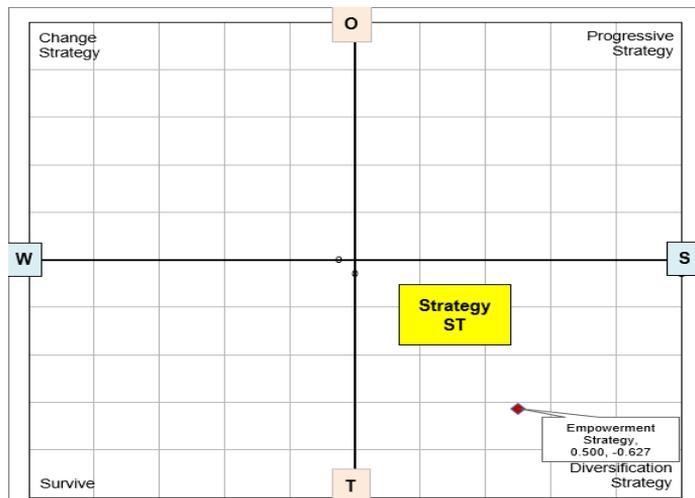


Fig. 2. SWOT analysis of strategy stage research results in quadrants.

Based on the four alternative strategies (SO, ST, WO, WT), it is necessary to know which strategy is appropriate for empowering defense resources in supporting the main task of the TNI in resolving territorial

violations at sea. The results of the QSPM matrix analysis and SWOT diagram show that the appropriate strategy is the ST strategy, namely empowering all national resource forces for defense in supporting the

main task of the TNI in resolving maritime territorial violations and threats therein in the South China Sea region.

5. DISCUSSION

Based on the research results, from the aspect of internal factor analysis consisting of four items (Human resources, Natural resources, Artificial resources, and Facilities and Infrastructure), 15 sub-items of strengths and 14 sub-items of weaknesses were obtained which can be explained that:

- a. From the aspect of human resources as a whole, we have an abundant workforce that is technologically literate and has a mentality and attitude of love for the homeland and nation in supporting a professional and knowledgeable military (TNI).
- b. From the aspect of natural resources, it is explained that Indonesia has abundant natural resources of minerals, metals, and biodiversity, accompanied by large maritime resources and sufficient renewable energy sources. However, there is still a lack of natural resource studies relevant to defense and synchronization with the defense industry and fragmented supply chains.
- c. From the aspect of artificial resources, it is explained that the government currently has a massive infrastructure development policy with quite

good technological development including the development of the defense industry within it. However, the development of SDB is still not synchronized with the defense system so the allocation of SDB for defense has obstacles, and there is also no comprehensive system or database.

- d. From the aspect of facilities and infrastructure, it is explained that the existing infrastructure network is quite widely spread across the North Natuna region, namely Based facilities, R&D facilities, communications networks, and cyber-infrastructure. However, access is still limited.

Second, based on the research results, from the aspect of external factor analysis consisting of six items (political, economic, socio-cultural, technological, environmental, and legal), 20 opportunity sub-items and 20 obstacle/threat sub-items were obtained. These results can explain that a free and active foreign political system with active participation in international forums is a good opportunity. However, on the one hand, there is still political intervention from large countries in resolving maritime territorial violations.

In the economic aspect, the use of natural resources, as well as the energy and fisheries sectors, which are part of the people's economy, are major capital in supporting the main tasks of the TNI. However, there is a need to balance the economy so that inequality does not occur in border areas. From a

socio-cultural aspect, it can support the use of cultural exchange and local wisdom in resolving conflicts. From technological, environmental, and legal aspects. Rapid technological developments encourage the transfer of the latest technology balanced with environmentally friendly technology. Meanwhile, in the legal aspect, the issuance of laws and bilateral agreements between countries can support the resolution of maritime territorial violations.

Third, the results of the SWOT and AHP analysis show that the steps for optimizing defense resources to support the TNI's main task in resolving territorial violations are a diversification strategy, namely empowering all national resource strengths for defense in resolving threats/obstacles. These strategic steps include:

- a. Empowerment of human resources to strengthen work skills and foster mental love for the homeland and nation as part of resolving economic inequality in border areas and the influence of incoming foreign culture as well as social disparities in society.
- b. Empowerment of mineral, metal, and renewable energy resources as well as large maritime resources as part of bilateral cooperation with other countries.
- c. Government policy in infrastructure development, followed by the development of the defense industry and the latest technology is part of resolving the

threat of technological dependence and cyber security as well as strengthening control over vast maritime territorial gaps thereby reducing illegal activities and differences.

- d. Infrastructure development plus facilities and infrastructure supported by the development of sea and air base facilities as well as communication and cyber facilities are part of reducing economic and social disparities at borders, strengthening coordination and communication between institutions.

6. CONCLUSION

From the explanation above, several things can be concluded as follows. Based on the results of the SWOT analysis, there are 15 internal factors in the form of strengths, with the professional military sub-item, Human resources (HR) aspect being the most influential with a weight of 0.134. Meanwhile, for weaknesses, there were 14 sub-items. The fragmented sub-items of Human resources (HR) policies and programs are the most influential with a weight of 0.179. Based on the results of the SWOT analysis obtained from six categories (Politics, Economy, Socio-Culture, Technology, Legal Environment), there are 20 external factors in the form of opportunities. Of the 15 sub-items, the sub-item Foreign policy system, free and active from political aspects, is the most influential

with a weight of 0.08. Meanwhile, for the obstacle/threat factor, there were 20 sub-items. The sub-item of economic inequality in border areas, the economic aspect, is the most influential with a weight of 0.105. The results of the SWOT and AHP analysis show that the steps for optimizing defense resources to support the main task of the TNI in resolving territorial violations are a diversification strategy, namely empowering all national resource forces for defense in resolving threats/obstacles.

Future Work

Based on experience in this research process, there are several and can be several factors for future research in perfecting the research. First, this research has not discussed the influence of national policy on the empowerment of defense resources. Future research can discuss this with the support of several mediator variables such as strategic leadership, organizational culture, and organizational capability. Second, there is a need for continuity of the leadership baton so that the achievements of the development stages that occur can continue in stages. This research has not discussed the sustainability of the defense resource empowerment program in supporting the main tasks of the TNI. Future research can discuss sustainability using a qualitative descriptive statistical method approach supported by system dynamics simulations.

ACKNOWLEDGEMENT

This research is supported by Indonesian Military's Staff and Command College and Indonesia Naval Technology College.

REFERENCES

- [1] N. Kipgen, "Indonesia: A Reluctant Participant in the South China Sea Disputes," *Strategic Analysis*, vol. 45, no. 2, pp. 116–127, 2021, doi: 10.1080/09700161.2021.1891762.
- [2] D. I. Sukmawan and R. Pedrason, "Assertively Hedging? Indonesia's Motives and Practices in the South China Sea," *Intermestic: Journal of International Studies*, vol. 7, no. 2, p. 701, 2023, doi: 10.24198/intermestic.v7n2.15.
- [3] A. Dipua, R. Hermawan, D. Puspitawati, N. Harahap, D. Rizanny Nurdiansyah, and L. Yudho Prakoso, "An Analysis of The South China Sea Conflict: Indonesia's Perspectives, Contexts And Recommendations," *Journal Of Archaeology Of Egypt/Egyptology*, vol. 17, no. 4, pp. 976–990, 2020, [Online]. Available: <https://archives.palarch.nl/index.php/jae/article/view/534>.
- [4] A. Sugiharto and P. Shafwatullah, "Maritime Diplomacy in Building Maritime National Security in Indonesia," *Jurnal Maritim Indonesia*, vol. 9, no. 2, pp. 121–131, 2021.
- [5] T. Herdijanto, Mulyadi, and A. K. Susilo, "Development Strategy of Revolution in Military Affair Concept by Indonesian Armed Forces (TNI) in The South China Sea," *Journal of Defense Resources Management*, vol. 10, no. 2, pp. 40–61, 2019.
- [6] M. I. Kusumah, "Information System Interoperability Strategy to Support Command and Control of Border Security Operations in the North Natuna Sea," *International Journal of Social Science and*

- Human Research*, vol. 05, no. 01, pp. 295–304, 2022, doi: 10.47191/ijsshr/v5-i1-40.
- [7] D. McRae, “Indonesia’s South China Sea Diplomacy: A Foreign Policy Illiberal Turn?,” *Journal of Contemporary Asia*, vol. 49, no. 5, pp. 759–779, Oct. 2019, doi: 10.1080/00472336.2019.1601240.
- [8] B. Pramono and A. K. Susilo, “the Development Strategy for Empowering the Defense Area of a Non-Military Aspect in Paciran, Lamongan,” *Journal of Defence Resources Management*, vol. 11, no. 2, pp. 195–221, 2020.
- [9] M. C. Pucheta-Martínez and I. Gallego-Álvarez, *Do board characteristics drive firm performance? An international perspective*, vol. 14, no. 6. Springer Berlin Heidelberg, 2020.
- [10] B. Barney, “Firm Resources and Sustained Competitive Advantage,” *Journal of management*, vol. 17, no. 1, p. 410, 1991.
- [11] M. J. Chen, J. G. Michel, and W. Lin, “Worlds Apart? Connecting Competitive Dynamics and the Resource-Based View of the Firm,” *Journal of Management*, vol. 47, no. 7, pp. 1820–1840, 2021, doi: 10.1177/01492063211000422.
- [12] Y. Gortzak, Y. Z. Haftel, and K. Sweeney, “Offense-defense theory: An empirical assessment,” *Journal of Conflict Resolution*, vol. 49, no. 1, pp. 67–89, 2005, doi: 10.1177/0022002704271280.
- [13] P. Cramer, “Seven Pillars of Defense Mechanism Theory,” *Social and Personality Psychology Compass*, vol. 2, no. 5, pp. 1963–1981, 2008.
- [14] T. Manca *et al.*, “‘We need to protect each other’: COVID-19 vaccination intentions and concerns among racialized minority and indigenous peoples in Canada,” *Social Science & Medicine*, vol. 313, no. April, p. 115400, 2022, doi: 10.1016/j.socscimed.2022.115400.
- [15] A. Yates, L. Starkey, B. Egerton, and F. Flueggen, “High school students’ experience of online learning during Covid-19: the influence of technology and pedagogy,” *Technology, Pedagogy and Education*, vol. 30, no. 1, pp. 59–73, 2021, doi: 10.1080/1475939X.2020.1854337.
- [16] P. Kolesnyk *et al.*, “Steps towards implementing evidence-based screening in family medicine in Ukraine: SWOT-analysis of an approach of multidimensional empowerment,” *BMC Family Practice*, vol. 22, no. 1, pp. 1–11, 2021, doi: 10.1186/s12875-021-01367-2.
- [17] A. K. Susilo, I. N. Putra, Ahmadi, and O. S. Suharyo, “Analysis of national maritime security strategy as an effect of regional development using SWOT, fuzzy multi criteria decision making (FMCDM) and borda,” *International Journal of Operations and Quantitative Management*, vol. 25, no. 3, pp. 153–174, 2020.
- [18] D. Tomar, “Porter’s Competitive Forces Model and SWOT Analysis To Payments,” *International Journal of Information Science*, vol. 10, no. 2, pp. 45–49, 2020, doi: 10.14445/22312803/ijctt-v68i10p110.
- [19] T. L. Saaty, “There is no mathematical validity for using fuzzy number crunching in the analytic hierarchy process,” *Journal of Systems Science and Systems Engineering*, vol. 15, no. 4, pp. 457–464, Dec. 2006, doi: 10.1007/S11518-006-5021-7.
- [20] A. Siekelova, I. Podhorska, and J. J. Impolla, “Analytic Hierarchy Process in Multiple-Criteria Decision-Making: A Model Example,” *SHS Web of Conferences*, vol. 90, p. 01019, 2021, doi: 10.1051/shsconf/20219001019.
- [21] M. Marzouk and M. Sabbah, “AHP-TOPSIS social sustainability approach for selecting supplier in construction supply chain,” *Cleaner Environmental Systems*, vol. 2, no. March, p. 100034, 2021, doi: 10.1016/j.cesys.2021.100034.
- [22] T. L. Saaty, “The seven pillars of the analytic hierarchy process,” *International Series in Operations Research and Management Science*, vol. 175, pp. 23–40, 2012, doi: 10.1007/978-1-4614-3597-6_2.

MISSION COMMAND DURING LOW INTENSITY BATTLES AND STABILIZING OPERATIONS. ARE WE PREPARED?

Imran Aslam RATHORE

Pakistan Army

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 and stabilizing operations and value the conflict in today's environment of continuous chaos.

Key words: *mission command; directional training; 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 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 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 manoeuvre 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 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]. 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 de-centralized 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].

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

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.

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 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.

REFERENCES

- [1] Eitan Shamir, “*The Long and Winding Road: The U.S. Army Managerial Approach to Command and the Adoption of Mission Command (Auftragstaktik)*,” *Journal of Strategic Studies* 33, no. 5 (2010), 653.
- [2] Joint Publication (JP) 1, *Doctrine for the Armed Forces of the United States* (Washington, DC: The Joint Staff, 2013).
- [3] *Ibid.*, V-14.
- [4] Marine Corps Doctrinal Publication 1-0, *Marine Corps Operations* (Washington, DC: Headquarters U.S. Marine Corps, 2011); and JP 3-07, *Stability Operations* (Washington, DC: The Joint Staff, 2011).
- [5] Milan N. Vego, *Joint Operational Warfare: Theory and Practice, 2nd ed.* (Newport, RI: U.S. Naval War College, 2009), X-22.
- [6] A.L.W. Vogelaar and E.H. Kramer, “*Mission Command in Ambiguous Situations*,” in *The Human in Command: Exploring the Modern Military Experience*, ed. Carol McCann and Ross Pigeau (New York: Kluwer Academic/Plenum Publishers, 2000), 230.
- [7] Jeffrey Buchman, Maxie Y. Davis, and Lee T. Wright, “*Death of the Combatant Command? Toward a Joint Interagency Approach*,” *Joint Force Quarterly* 52 (1st Quarter 2009), 94; and JP 3-07, viii.
- [8] Boyd, J.R. 2018. *A Discourse on Winning and Losing*. Maxwell AFB: Curtis E. LeMay Center for Doctrine Development and Education, Air University Press.
- [9] Gudmundsson, B. 1995. *Stormtroop Tactics: Innovation in the German Army, 1914–1918*. New York: Praeger.
- [10] Shamir, 647.
- [11] *Ibid.*
- [12] Leonhard, R. 1994. *Fighting by Minutes*. London: Praeger.
- [13] Shamir, 650
- [14] *Ibid.*, 652

- [15] Ibid., 653
- [16] Boyd, J.R. 2018. *A Discourse on Winning and Losing*. Maxwell AFB: Curtis E. LeMay Center for Doctrine Development and Education, Air University Press.
- [17] Office of the Under Secretary of Defense for Acquisition, Technology, and Logistics, Transition to and from Hostilities, Defense Science Board 2004 Summer Study (Washington, DC: Department of Defense, 2004), iv.
- [18] Michael J. McNerney, "Stabilization and Reconstruction in Afghanistan: Are PRTs a Model or a Muddle?" *Parameters* (Winter 2005–2006), 34.
- [19] McNerney, 44.
- [20] Milan N. Vego, *Joint Operational Warfare: Theory and Practice*, 2nd ed. (Newport, RI: U.S. Naval War College, 2009), X-22.
- [21] Mark S. Martins, "No Small Change of Soldiering: The Commander's Emergency Response Program (CERP) in Iraq and Afghanistan," *The Army Lawyer* (February 2004), 2.
- [22] Touku Piiparinen, "A Clash of Mindsets? An Insider's Account of Provincial Reconstruction Teams," *International Peacekeeping* 14, no. 1 (2007), 143.
- [23] Seth A. Shreckengast, "The Only Game in Town: Assessing the Effectiveness of Village Stability Operations and the Afghan Local Police," *Small Wars Journal*, March 27, 2012, 2.
- [24] JP 3-07, *Joint Doctrine for Military Operations Other Than War* (Washington, DC: Chairman of the Joint Chiefs of Staff, 1995)
- [25] Lind, W. 1985. *Maneuver Warfare Handbook*. Boulder: Westview Press.
- [26] Van Creveld, M. 1982. *Fighting Power: German and U.S. Army Performance, 1939–1945*. Westport: Greenwood Press.
- [27] Muth, J. 2011. *Command Culture: Officer Education in the U.S. Army and the German Armed Forces, 1901–1940, and the Consequences for World War II*. Denton: University of North Texas Press.
- [28] Labarbera, J. D. 2018. "Planting the Seed." In *Mission Command: The Who, What, Where, When and Why*. An Antology, Volume II, edited by Vandergriff, D. and S. Webber. Createspace Independent Publishing Platform: 149–161.
- [29] Vandergriff, D. E. 2019. *Adopting Mission Command: Developing Leaders for a Superior Command Culture*. Annapolis: Naval Institute Press.
- [30] Storr, J. 2003. "A Command Philosophy for the Information Age: The Continuing Relevance of Mission Command." *Defence Studies* 3 (3): 119–129.
- [31] Labarbera, J. 2017. "The Sinews of Leadership: Mission Command Requires a Culture of Cohesion." In *Mission Command: The Who, What, Where, When and Why*. An Antology, edited by Vandergriff, D. and S. Webber. CreateSpace Independent Publishing Platform.
- [32] Shamir, E. 2011. *Transforming Command: The Pursuit of Mission Command in the U.S., British, and Israeli Armies*. Stanford: Stanford University Press.
- [33] Ploumis, M., and L. E. Pilalis. 2018. "Implementing Sustainable Mission

- Command in the Hellenic Army.*" *Defence Studies* 18 (1): 95–112.
- [34] Storr, J. 2009. *The Human Face of War*. London: Continuum.
- [35] Flynn, M., and C. Schrankel. 2013. "Applying Mission Command through the Operations Process." *Military Review*, March-April.
- [36] Jeffrey Buchman, Maxie Y. Davis, and Lee T. Wright, "Death of the Combatant Command? Toward a Joint Interagency Approach," *Joint Force Quarterly* 52 (1st Quarter 2009), 94; and JP 3-07, viii.
- [37] James A. Russell, "Into the Great Wadi: The United States and the War in Afghanistan," in *Military Adaptation in Afghanistan*, ed. Theo Farrell, Frans Osinga, and James A. Russell (Stanford: Stanford University Press, 2013), 54.
- [38] David S. Alberts and Richard E. Hayes, *Command Arrangements for Peace Operations* (Washington, DC: NDU Press, 1995), 14; JP 3-07, xi.
- [39] Decentralized execution guided by commander's intent is central to the military doctrine of, among others, Australia, Canada, Israel, the Netherlands, and the United Kingdom.
- [40] McNerney, 34.
- [41] Vagnjel, P. C. 2018. "Mission Command." In *Mission Command: The Who, What, Where, When and Why*. An Antology, Volume II, edited by Vandergriff, D. and S. Webber. Create space Independent Publishing Platform: 3–18.
- [42] Grauer, R. 2016. *Commanding Military Power*. Cambridge: Cambridge University Press.
- [43] A.L.W. Vogelaar and E.H. Kramer, "Mission Command in Ambiguous Situations," in *The Human in Command: Exploring the Modern Military Experience*, ed. Carol McCann and Ross Pigeau (New York: Kluwer Academic/Plenum Publishers, 2000), 230.
- [44] Shamir, E. 2011. *Transforming Command: The Pursuit of Mission Command in the U.S., British, and Israeli Armies*. Stanford: Stanford University Press.
- [45] Carl von Clausewitz, *On War*, ed. and trans. by Michael Howard and Peter Paret (Princeton: Princeton University Press, 1976). pp. 184 and 186.
- [46] Anthony Kellett, *Combat Motivation: The Behavior of Soldiers in Battle* (Boston: Kluwer Boston, Inc., 1982), pp. 231-269.

IMPLICATIONS OF INTERNET AND SOCIAL MEDIA ADDICTION ON THE PERFORMANCE OF MEDICAL PERSONNEL IN CIVILIAN AND MILITARY HEALTH FACILITIES

Mihaela BARCAN*, Laurentiu BARCAN

***TB Hospital Leamna, Craiova, Romania**

This scientific paper aims to identify the links between the use of social networking sites and the professional performance of employees in the medical field, as well as the negative side effects arising from the use of social networks, including the emergence of social network addiction and anxiety disorders or personality, especially in the post-pandemic period of COVID-19. The research indicated a significant relationship, i.e., a weak positive correlation between the use of social networks, and Internet and social network addiction. Correlations were found between the mediators belonging to the secondary effects of social media use and employee performance. According to the model developed by the author, participants who reported higher levels of anxiety disorders or internet addictions reported lower levels of performance. Those addictions are significantly related to both social media use and individual performance, and thus meets at least some of the criteria for being a mediator.

Key words: professional performance, addiction, social networks, internet, medicine, anxiety disorders, health, personality disorders.

1. INTRODUCTION

In the realm of internet and social media addiction, there are reports of individuals playing computer games or spending time online for days on end. This happens without rest, without proper hydration and nutrition, or without social contact outside of the online environment, but often during work hours. Brand (2022) said some time ago that although the Internet offers

many opportunities, there is a downside, namely that some people suffer from diminished control over the use of certain Internet applications.

In the post-COVID-19 pandemic period, this has also raised concerns among other researchers about the problematic use of the Internet by healthcare workers, especially social media, and online gaming, resulting in functional impairment and distress in life every day, both

professionally and socially or psychologically.

Internet applications from the range of online games and social networks, which are often used problematically, give employees pleasure, and allow the reduction of negative mood, sometimes created by the suffering that is unconsciously emanated by patients, often accompanied by terrible visual or auditory sensations. These responses show parallels with the effects of drugs, which create addiction on the brain's reward system, examples being including the phenomena of phubbing or nomophobia.

In addition, patterns of compulsive use of social networks or mobile phones on the Internet may develop, with self-monitoring being an important factor in determining whether the enjoyment and compulsion to use certain Internet applications may lead to problematic use in healthcare personnel, from civilian and military health units.

Given the increased use of the Internet and social media in this era of social distancing and remote working, it is important to assess the harm caused by addictive online behaviors.

With the onset of digitization, online social networks have developed as virtual entities without which it would be difficult to imagine our daily lives. From a

purely formal point of view, online social networks are virtual channels that, based on Internet technologies, allow users, young or old, to interact.

In fact, the identity of the person is difficult to prove and accept, the communication in real time or asynchronously providing, timely or not, the relationship of third parties for obtaining an immediate or future benefit. Especially during the COVID-19 pandemic, where face-to-face contact has been drastically reduced by the recommendation to stay at home and work or study from home, online social networks have been used more than ever.

In this context, the objective of this scientific research is to study the psychological effects of the Internet on civilian and military employees in the medical field, in the period following the COVID-19 pandemic, as well as the emergence of addiction to the Internet and social networks, as a secondary effect of their use.

The decision-making problem of the scientific approach, related to the theoretical aspects addressed, consists in evaluating and identifying how the use of social networking sites generates addiction to them, as well as anxiety and personality disorders, respectively influences the performance of employees in the medical field, during post-pandemic COVID-19.

For this, it is important to study the negative side effects and their origin, being relevant to carry out an analysis of the impact that the use of social networks has on individuals.

2. EFFECTS OF SOCIAL MEDIA ADDICTION ON PERFORMANCE

The term addiction is linked in the collective consciousness mainly to smoking, alcohol, drugs, and gambling. However, with the increasing use of computers and the Internet, technology addiction has become a social problem since the mid-1990s.

Zhao (2021) argues that in recent decades Internet and social media addiction has attracted academic attention, referring to the obvious social and psychological damage caused by the excessive use of the Internet and social networks, which seriously damages the physical and mental health of users.

Due to the widespread use of the Internet and the evolution of technology, but also the trend of working and socializing online, since the post-COVID-19 pandemic, social networking websites are increasingly entering daily life by day. Individuals tend to use online social networks to participate in informational and social activities, including news channels, gaming, socializing, spending free time on

the Internet, communicating, and sending images or movies. Such attractive opportunities offered by online social networks play an important role in the lives of many people of different age groups and permanently affect their lives.

According to Bakioglu et al. (2022), in the last decade the use of smartphones and social networks has become more widespread around the world. Centralized data from the United Nations shows that in January 2024 there were 5.61 billion mobile phone users, 5.35 billion Internet users and 5.04 billion active social media users globally.

Social networking sites can thus be defined as virtual communities where users can create individual and general profiles, interact with their friends, and meet other people in accordance with common goals. These have brought about significant changes in the way people communicate with others, as developments in the characteristics of information technologies play a significant role in the widespread use of social networks and increasing addiction.

Zhao (2021) pointed out that in China, online social networks are widely used in almost all aspects of life, including communication, education, entertainment, information search, decision making, mobile payment, etc., and the number of social network users

exceeded one billion. China's local online social networks, represented by WeChat, not only have functions such as instant messaging, entertainment, and information sharing, but also mobile payment functions.

If individuals don't use social media in China, their life will be very inconvenient, like they can't get the information on time, they can't find out the latest news and even they can't make payments. Globally, the use of online social networks has become an important part of Internet use, with psychological research pointing out that if individuals use social networks excessively and cannot control their own activities, they are considered to have symptoms of social media addiction.

The use of online social networks can bring satisfaction to users, but it is the main reason for the addictive disorder developed on social networks. Due to the diversity of functions of online social networks, users may be addicted to social activities such as posting, sharing content or other activities, or such as gaming. The self-centered nature of social media pushes people toward problematic use, contributing to the development of addictive behaviors.

Online social networks cause individuals to look different from who they really are, and live delightful experiences. In addition,

the opportunities provided by social media make users happy, and create excitement, by filling a psychological void in individuals' lives. Along with the popularity of online social networks and the many benefits they offer to users, spending too much time on a social network is considered a sign of social media addiction, and can cause psychological disorders.

The research team van den Eijnden et al. (2016) pointed out that, despite the fact that the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) recognizes Internet addiction only as a temporary disorder, in the appendix of this guide (American Psychiatric Association, 2013), social media addiction does not yet have a status in the DSM-5. In their opinion, the fact that social media addiction is not included in the DSM-5 creates the impression that social media addiction is not a psychological problem, and the fact that there are no explicit definitions and precautions for social media addiction negatively affects the conduct of research on these widespread behaviors.

Referring to the link between individual well-being and Facebook use, Böhmer (2022) highlighted that excessive use of social networks is associated with anxiety, frustration, intolerance, anger, low self-esteem,

impoverishment of social relationships, decreased performance, verbal aggression or physical and prone to depression. In addition, the researcher also found that excessive use of social media can lead to problems such as anxiety disorders or the emergence of social media addiction.

For example, Chashmi et al. (2023) argue that the overall use of the Internet and online social networks has increased dramatically in recent years. Although social media use has many beneficial effects, problematic online social media use, such as Internet use disorder, appears to have increased recently.

Fear of Missing Out (FoMO) was described by Przybylski et al. (2013) as a negative affect resulting from thoughts that one may be left out of the rewarding experiences of others, creating a scale to measure its intensity.

On the other hand, Chotpitayasunondh & Douglas (2018) explained that phubbing means the practice of ignoring the companion or companions in order to pay attention, to the phone or other mobile device. Przybylski et al. (2013) argued that fear of missing out is the negative affect that occurs when a user feels that others have rewarding experiences in their absence.

Research on FoMO shows that this construct is associated with a large number of psychological and behavioral problems (Przybylski et al., 2013). Specifically, FoMO is a construct introduced to explain why social networks often have adverse consequences.

Design elements such as push notifications and content time restriction could trigger the fear of missing out. It is worth noting that the FoMO process is being exploited by the technology industry, as the data business model behind social media platforms is aimed at extending time online, through the design of the platform.

Therefore, it is not surprising that the experience of FoMO appears to contribute to the negative consequences associated with problematic social media use (PSMU) and problematic smartphone use. Negative effects on productivity have been reported when users establish problematic patterns of social media use.

According to Przybylski et al. (2013), FoMO is a pervasive apprehension that others may enjoy rewarding experiences that one cannot participate in. FoMO has attracted much attention among researchers because the condition of FoMO is accompanied by distress, physical symptoms, and negative affect. Some studies indicate that FoMO is associated with social

media addiction or problematic social media use.

In fact, FoMO is unique in predicting PSMU beyond negative self-evaluations and low self-presentation skills. Very recent studies have shown the relationship between FoMO and PSMU, phubbing and depression. The studies of Veysua et al. (2023) also indicated that FoMO is associated with psychopathological symptoms such as loneliness and depression, anxiety, poor sleep quality, and alcohol consumption.

It should be noted that FoMO, PSMU, or phubbing are not found in DSM-5, the latest edition of the Diagnostic and Statistical Manual of Mental Disorders (American Psychiatric Association, 2013). They are the subject of numerous studies aiming at their inclusion in the pathological area. The causal relationship between social media/internet use and FoMO remains unclear.

Some researchers argue that social media/internet use precedes FoMO, while others argue for the inverse relationship. The evidence provided by Rozgonjuk et al. (2020) suggest that FoMO tendencies could be closely related to the five factor model of personality, which represents a hierarchical organization of personality traits synthesized on five dimensions, namely extraversion, agreeableness,

conscientiousness, neuroticism, and openness to experience. Therefore, FoMO might be best conceptualized as a trait.

Although online social media use clearly has some beneficial consequences for communication and social connectedness, it is also associated with negative mental states such as FoMO (Wang et al., 2019). The relationship between FoMO and PSMU was examined, by treating FoMO as a direct predictor of overuse, or as a mediator, in the association between PSMU and psychopathology.

Less explored is the possibility that FoMO is, at least in part, the result of excessive social media use. Examining other potentially problematic behaviors, such as online disinhibition and inappropriate selfie sharing, in the context of FoMO is warranted, as these behaviors might mediate the relationship between FoMO and PSMU.

Compensatory Internet use theory conceptualizes excessive Internet use as a substitute for something the user lacks, such as social interaction. Negative emotions increase the likelihood of using social media to alleviate negative emotional states such as loneliness or depression.

However, social media can also exacerbate negative feelings, including FoMO, which could

ultimately lead to PSMU. When people feel disconnected from social information and events, they are likely to overuse social media to regulate these negative emotions and feel more socially connected, but such a strategy may be ineffective in the long run. Through a vicious cycle, it could lead to prolonged online use of social media platforms and PSMU.

Research by Chashmi et al. (2023) claimed a number of benefits associated with the use of social networks among young employees, starting from the premise that, viewed as a channel of communication and as a source of social support, social media play a crucial role in learning environments.

Social networking applications provide wide access to information and information resources, reduce barriers to group interaction, improve engagement between them and their managers, support active and social learning, increase motivation, encourage them to learn more about self-learning, and support collaborative learning activities.

Chashmi et al. (2023) considered that despite the benefits of facilitating and enhancing communication, online social networks also seem to present some threats. For example, problematic use of the social networks

WhatsApp, X (formerly Twitter), and Instagram is negatively correlated with performance, well-being, positive mood, and life satisfaction.

Social media can change a person's daily habits, and excessive Internet/social media use is associated with maladaptive psychological states and behaviors such as depression, anxiety, boredom, procrastination, loneliness, cognitive impairment, and interpersonal difficulties. Excessive social media use also predicts lower productivity and lower performance.

Chashmi et al. (2023) observed that an increase in psychological distress and social distancing during the COVID-19 pandemic appeared to increase social media use and addiction tendencies towards social media platforms. According to Pang (2018), well-being usually refers to an individual's overall perception and evaluation of their own life conditions or specific areas of life.

As a multifactorial construct, subjective well-being mainly includes the cognitive judgment of overall life satisfaction and the emotional evaluation of emotions and feelings. Because of these different dimensions of the concept (i.e., life satisfaction, positive emotions, and negative emotions) that reflect a person's subjective view of life experience, well-being

is often defined as subjective well-being.

Social media use was operationalized as a formative construct to investigate its impact on well-being. Given that people typically use more than one social media product at the same time, social media must be studied as an umbrella construct to better understand the relationship between social media use and individuals' well-being.

Kim et al. (2020) said so, in general, the use of online social networks can have a positive impact on employees, and some research has pointed out that social networks could help users build social capital, reduce loneliness, or improve well-being.

However, some studies (Andreassen et al., 2016) have claimed that if individuals use social media too often, they may develop social media addiction, which will affect their physical and mental health, while other studies have even suggested that there is a non-significant relationship, between social media use and subjective well-being.

Under these conditions, Wang et al. (2019) believe that based on the main functions of serving users, the use of social networks can be divided into two types, namely social use (communication and interaction, update status,

commenting, etc.) and entertainment use (accessing games, listening to music, surfing the web, etc.).

Böhmer (2022) pointed out that whether it is for social use or entertainment, users need to spend a lot of time on social media, which can lead to social media addiction. The results of the research carried out by Wang et al. (2019) showed that social use and entertainment use have different effects on social media addiction and subjective well-being.

As such, entertainment use is more likely to lead to social media addiction, and social use tends to improve individual well-being. Additionally, social media addiction has a negative impact on well-being.

This inconsistency may be due to different types of social networks, and different types of use may have different effects on well-being. In addition, there may be differences in the perception of well-being between addicted and non-addicted users. However, there are few empirical studies to verify these views.

In this context, Pang (2018) studies have focused on the social use of different social media services, and the results show that social use has a positive impact on the subjective well-being of users. For example, the social use of social media could improve users' perceived bonding social capital and

subjective well-being, with positive impact on performance.

Basically, researchers Kim et al. (2020) demonstrated that individuals communicate with a wide range of people on social networks, which is positively related to their subjective well-being and performance. Even though online social media use for social purposes sometimes helps foster social connections and has a positive impact on personal life, the relationship between online social media use and performance, or personal happiness, can become extremely weak or irrelevant when use online social networks for personal, entertainment and recreational purposes, such as playing online games or browsing online content.

Chandani et al. (2019) pointed out that employees' use of WhatsApp for gaming purposes has a negative impact on their physical well-being and performance. Furthermore, if these users are addicted to the game, it may have a negative impact on their subjective well-being and performance at work.

Online social media addiction means that users spend a lot of time on social media, including at work, and ignore the people and things around them, which affects their physical and mental health and reduces their performance and subjective well-being. A meta-analysis of 70 primary studies shows

that users with Internet addiction have more negative emotions, lower performance, and less subjective well-being (Lei et al., 2019).

Empirical research by Ko & Turan (2020) indicates that addiction to online social networks is negatively associated with individuals' subjective well-being, with negative impact in the sphere of professional performance and workplace engagement. Directly, social media addiction does not significantly influence activity engagement scores.

However, there are significant indirect inverse effects on engagement. Depressive symptoms and self-esteem mediate these effects. Social media addiction increases depression symptoms, which in turn decreases activity engagement scores.

Dependence on online social networks lowers self-esteem, which serves as a variable that significantly increases engagement. Overall, the findings suggest that online social media addiction has a total inverse effect on engagement and performance, with depressive symptoms and self-esteem mediating this relationship.

Landa-Blanco et al. (2024) argue that extensive and excessive engagement with online social networks can lead to a form of addictive behavior. In such a case, many individuals risk developing an

obsessive need to stay online that interferes with their daily lives.

This addiction often results in the individual overlooking fundamental needs such as sleep, personal interactions with loved ones, and daily tasks at work, affecting professional and mental performance. It also manifests itself in various adverse emotional and behavioral states, including interpersonal conflicts at work or in the private environment.

At the same time, social media addiction induces effects similar to the consumption of psychoactive substances, contributing to the deterioration of self-esteem, mental health and performance. Additionally, individuals tend to underestimate the amount of time they spend on social media, and abstaining from it can cause restlessness, irritability, and withdrawal symptoms.

Self-esteem, a subjective assessment of an individual's self-worth, can have a significant impact on well-being and performance. It is important to note that self-esteem is not necessarily an objective reflection of a person or how others evaluate them. Greater use of online social networks has been consistently associated with lower self-esteem scores, which in turn are correlated with lower performance.

This link between social media use, self-esteem, and job

performance underscores the far-reaching consequences of online social media addiction on people's lives. In this context, addictive Internet use is also linked to increased depressive and anxiety symptoms.

Depression is a negative result of the inability to cope with the stresses of life; its symptoms involve persistent and intense feelings of helplessness, hopelessness, dissatisfaction, sadness, pessimism, and worthlessness. These symptoms are associated with adverse effects on emotions, thoughts, motivations, social relationships, and physical well-being.

Symptoms of depression are a prevalent problem faced by many young workers and beyond. Anxiety is a reaction with cognitive, psychological, and behavioral components, which is characterized by physical and mental agitation.

Emerging research suggests that online social networking and Internet addiction exerts a multifaceted influence on performance and psychological well-being. While its impact on professional performance is indirect, it directly contributes to increased levels of stress and anxiety among users.

This increased stress can further exacerbate anxiety, which in turn has a negative impact on performance. In addition, stress

directly contributes to anxiety, which can lead to depression.

These findings underscore the importance of social media addiction and its potentially substantial impact on employee performance and psychological well-being and career trajectories.

According to Landa-Blanco et al. (2024), engagement encompasses the extent to which individuals actively participate and are involved in activities within their formal education and the fulfillment of their duties at work. Commitment appears as an essential factor in the evaluation of well-being and professional performance.

Numerous scientific studies delve into this issue from various perspectives, including institutional factors, individual aspects, basic psychological needs, legal vulnerability, absenteeism, and employability of individuals addicted to the Internet and online social networks. Commitment correlates with successful performance and integration of employees into the professional environment, regardless of age.

High engagement drives superior performance and productivity, facilitates positive adaptation, and improves physical and mental well-being, while reducing the likelihood of career dropout. Individual engagement can be influenced by various factors, including individual

characteristics, relationship philosophy, methods used by trainers or managers, inter-personal relationships, and the general context in which the practices are implemented.

Individuals with high self-esteem tend to have more confidence in their abilities, increasing their motivation, which leads to better performance. Consequently, there is a positive relationship between self-esteem, commitment, and performance.

However, research indicates that addiction to online social media can negatively affect mental health, performance, and career outcomes. Other studies indicate that excessive social media consumption is linked to greater procrastination and distraction, and decreased productivity, negatively impacting overall performance.

Landa-Blanco et al. (2024) argue that the COVID-19 pandemic has had significant effects on the mental health of the population, with high levels of obsessive-compulsive symptoms, anxiety and interpersonal sensitivity being reported. The COVID-19 pandemic has also triggered a series of health restrictions that have limited spaces for social interaction and increased virtualization, including in the relationship with employers.

As a result, there has been a significant increase in the use of

social media, an issue that, if neglected, has the potential to be detrimental to people's performance, well-being, and mental health.

3. TOOLS FOR STUDYING THE EFFECTS OF INTERNET ADDICTION

Considering the psychological, social, economic, cultural, and educational losses caused by social media addiction, it is significant to determine the level of social media and Internet addiction. Van den Eijnden et al. (2016) pointed out that when research is reviewed, it is possible to get the impression that Facebook addiction has the same meaning as social media addiction, which is wrong.

Addiction scales developed in this regard are focused on Facebook addiction or problematic Facebook use (Andreassen, 2015) and have become intense. Currently, the multitude of social networks are widely used and have different characteristics in terms of functionality and convenience.

For this reason, it is important to have distinct psychological tools to be able to identify a possible social media addiction early. However, the diversity of social networks makes studies of social media addiction problematic, especially due to the rapid changes in the social media environment and the expansion of

interactive features, which will make measurement tools targeting specific social networks out of date.

At the same time, van den Eijnden et al. (2016) pointed out that the criteria that can cause social media addiction may vary, which will cause problems in the process of comparing related research conducted. The distinctive nature of each social networking environment and the differences in the opportunities it provides reveal that social media addiction should be considered as distinct from Internet or Facebook addiction.

Therefore, they argued that the development of studies on social media addiction requires the development and validation of a general scale of social media addiction.

Even though in recent years various scales have been developed regarding the addiction to social networks, the insufficient amount of research in the field and the need to develop scales in this sense have been the main problem. However, it can be seen, that some of the measurement tools developed are aimed at youth and adults, while others are aimed at adolescents and young adults. For example, the Social Media Disorder Scale developed by van den Eijnden et al. (2016) involves the 10-17 age group.

The Bergen Social Media Addiction Scale (BSMAS) is a

modified version of the Bergen Facebook Addiction Scale (BFAS) previously published by Andreassen et al. (2012). In fact, Andreassen et al. (2016) replaced the word Facebook with the term social media, defined as X (formerly Twitter), Instagram, etc. and the Bergen Facebook Addiction Scale was adapted as the Bergen Social Media Scale.

The six-item BSMAS was used to assess social media addiction. This scale, which considers salience, mood, modification, tolerance, withdrawal conflict, and relapse, is based on the components model of addiction and assesses social media addiction based on symptoms and associated adverse effects caused by problematic use during the year previous.

A five-point Likert scale ranging from very rarely (1) to very often (5) was used to answer each question on the BSMAS. Raw scores for each item are summed to produce the final score (range 6–30), with a higher score indicating greater degrees of social media addiction.

In the overall evaluation, it is observed that the scales for social media addiction differ from each other in terms of the target group. The original scale involved young adults. Therefore, there is a need for an easy-to-apply scale that involves a target population with a wider age range.

The presence of social media addiction can be discussed depending on the definition of addiction used. However, there is evidence that some social media users experience addiction-like symptoms due to excessive use. In addition, many studies have shown that social media is addictive.

It can be seen in the literature that researchers investigating social media addiction primarily focus on Facebook addiction. However, it has been discussed that Facebook is only a social network and therefore there is a need for valid scales involving other social networks that measure social media addiction (Andreassen et al., 2016).

Although social networks, as a subdimension of the Internet, have similar characteristics in terms of intended use, they differ in their individual and purpose-specific uses (van den Eijnden et al., 2016). In the specialized literature, it could be observed that the scales have differences in terms of factor structures and target groups, and the range of total explained variance varied between 35% and 59%.

The factor structures of these scales, which were developed for different age groups, differ from each other. For criterion validity in measurement tools developed to measure social media addiction van den Eijnden et al. (2016) used the compulsive internet use scale.

The Smartphone Addiction Proneness Scale (SAPS) was developed by Jung & Kim (2014) and later used to assess social network addiction proneness in the form of the Social Network Site Addiction Proneness Scale (SNSAPS) construct.

The SNSAPS was made by modifying the items of existing scales that assess smartphone, internet, and Facebook addiction, having 24 items and four factors, namely 1) tolerance and concern, 2) avoidance of negative emotions, 3) disruption of daily life and loss of control and 4) virtual life orientation and withdrawal.

The Reasons for Using Social Media Scale (SUMS), developed by Shin & Lim (2018) and used to measure reasons for using social networking sites, consists of 30 items, each representing one of six subscales: information, enhancement, social, conformity, entertainment, and adaptation motive.

Respondents are asked whether they use such sites for the specified reason on a five-point scale ranging from 1 (strongly disagree) to 5 (strongly agree). In another version, the SUMS has a four-factor structure consisting of information-enhancement, enjoyment, social-compliance, and adaptation motives.

Regarding FoMO, based on the specialized literature, its reliable and valid measurement is an extremely relevant topic. Over time, several

scales have been developed to measure FoMO. Przybylski et al. (2013) introduced an initial ten-item, single-factor scale measuring individuals' overall FoMO experience.

Using Przybylski's FoMO scale as a starting point, Alt (2015) developed a FoMO scale containing three factors, namely Social FoMO, News FoMO and Commercial FoMO.

Zhang et al. (2020) developed an eight-item scale with social and personal dimensions after Wegmann et al. (2017) assessed FoMO with a 12-item bidimensional scale, whose psychometric properties were established on a group of Instagram users (Veysuei et al., 2023).

Al Abri (2017) developed a scale to assess FoMO related to alcohol consumption and after Li et al. (2021) developed for FoMO a new scale, FoMO was considered a distinct negative emotion by Ma et al. (2021), who developed a 15-item scale. The FoMO scale (Przybylski et al., 2013) has been used in recent years and developed by Gil et al. (2015).

According to Sela et al. (2020), the FoMO scale is a self-report questionnaire developed based on self-determination theory. In addition to the original English edition, translations included Romanian, Italian, Spanish, Arabic, Turkish and others. In previous studies, test-retest reliability and internal consistency of the various versions were good, but structural validity was inconsistent.

Regarding the concurrent validity of the FoMO scale (Przybylski et al.,

2013), previous studies have found that FoMO is associated with problematic online behaviors such as Internet addiction (Sela et al., 2020), problematic smartphone use (Elhai et al., 2020), PSMU (Rozgonjuk et al., 2020), psychopathological symptoms (Tsai et al., 2019), poor psychological well-being (Dutot, 2020), poor sleep quality (Adams et al., 2020), poor performance (Whelan et al., 2020) and phubbing behavior (Fang et al., 2020).

Conclusively, the FoMO scale (Przybylski et al., 2013) shows a positive association with PSMU and a positive association with negative emotionality, facts that support the concurrent validity of the scale. A robust factor analysis by Sette et al. (2020) aimed to develop and validate a modern FoMO scale, under the acronym ON-FoMO, which captures four distinct core dimensions of FoMO among social media users, namely the need for belonging, the need for popularity, anxiety and addiction.

The new scale correlated highly with the FoMO scale, the main tool used in previous studies, as well as with other assessments of smartphone and social media addiction, finding associations with low life satisfaction, depression and suicide attempts.

Carmona-Halty et al. (2019) recommend that the Utrecht Work Engagement Scale (UWES-9S), a nine-item Likert-type questionnaire with a seven-point answer set (0 = never; 6 = always), be used to measure engagement, as and the

Patient Health Questionnaire (PHQ-9), a nine-item Likert scale measuring depressive symptoms experienced in the past two weeks, with each item scored on a scale from 0 (not at all) to 3 (almost every day).

The total score for each item, which ranges from 0 to 27, is calculated by summing all responses. A score of 10 or more was considered indicative of depression, while a score of less than 10 was considered to indicate no depressive symptoms.

The Generalized Anxiety Disorder Scale (GAD-7), a seven-item Likert-type scale that uses a four-point scoring system (0 = not at all; 3 = almost every day) and measures the prevalence of anxiety symptoms experienced in the last two weeks is recommended by Camargo et al. (2023). A subject can receive a score from 0 to 21, with a higher score indicating more severe anxiety symptoms, with those scoring 10 or more being considered to have anxiety symptoms.

In the current context, disrupted by the COVID-19 pandemic and the socio-economic effects generated by it, the use of social networks has seen a significant increase. In this scientific research, we aim to study the psychological effects of this evolution on the performance of civilian and military employees in the medical field.

4. THE OBJECTIVE AND HYPOTHESES OF PRESENT SCIENTIFIC RESEARCH

The objective of the scientific research is to study the psychological effects of the Internet on the performance of civilian and military employees, from the medical field, in the period following the COVID-19 pandemic, as well as the emergence of addiction to social networks as a side effect of their use.

The decision-making problem of the scientific approach, related to the theoretical aspects addressed, consists in evaluating and identifying the way in which the use of social networking sites generates addiction to them and anxiety or personality disorders, respectively influences the performance and well-being of individuals in the period after the COVID-19 pandemic. For this, it is important to study the negative side effects and their origin, being relevant to carry out an analysis of the impact that the use of social networks has on the condition and performance of individuals.

The goal of scientific research, considering these aspects, is to identify the links between the use of social networking sites and the condition of individuals, as well as the factors that generate negative

side effects, as a result, of the use of social networks, including the emergence of social network addiction and sleep disorders. The establishment of the goal was premised on the idea that the fundamental human need is to belong to social groups.

The relationship between the use of social networking sites and the individual's performance and well-being is not so easy to explain, with several studies investigating the relationship between the use of social networks and aspects of well-being but finding different results. On the one hand, social media use appears to have a negative influence on performance or well-being, or aspects related to it, and social media use has been significantly associated with increased depression in employees in stressful work environments. Spending too much time on social media reduces life satisfaction, but on the other hand, social media use can have some positive effects on well-being.

As shown by the previously mentioned studies, the use of social networks can increase the well-being of users by giving them a sense of community, but it is not conclusive how it affects professional performance. Online social media use encourages social connections, improving well-being.

However, negative and positive effects of social media use can coexist, so the present study aims to

identify the circumstances under which social media use can be beneficial and the circumstances under which social media use can be detrimental to users' well-being. Assuming that, social media use has a direct, one-sided impact on well-being could be misleading, so it is important to consider the context of social media use in a user-oriented way.

It is imperative to keep in mind that most social media users are young adults. As the majority of social media users are young adults, and various studies such as those already discussed in the previous chapter show that the use of social media influences their performance and well-being, this study focused on a group of 316 civilian and military employees of some medical institutions, taking into account the context of use social networks and determining different motivations for their use and subsequent consequences.

Social media users are goal-oriented and actively use these sites to satisfy their individual needs, from the fact that the individual needs belonging, as he wants to understand the social world, control, self-enhancement, and trust in others. In the theoretical context addressed, we observed that the informational and social and professional fulfillment needs of users are the basic expectations for the use of social networking sites and that determine their use.

The occurrence of FoMO symptoms may influence performance

and well-being, given that social media use encourages social connectedness and thus satisfies users' need for belonging. Based on this, it can be suggested that different needs can be reasons for using social networks, which can vary in intensity and thus can be fulfilled to different degrees or measures.

Starting from the assumption that social networks serve as tools for satisfying the needs of individuals, it could be deduced that the use of different social networks can lead to an improvement in the well-being of those who perceive their individual needs to be satisfied. At the same time, the intensive use of social networks can generate unwanted effects, with various implications in the sphere of well-being, including decreasing the quality of sleep and the appearance of depression symptoms.

This plan also includes the appearance of anxiety disorders and personality disorders, which can decisively affect the professional performance of the employee in the medical field. Information needs, also called cognitive needs, are related to finding information, deepening understanding and gaining new knowledge, information seeking being an important reason for using social networks.

Users' entertainment needs, labeled as emotional or affective needs, demonstrate users' tendencies to seek positive experiences such as enjoyment and fun on social media. Users' need for entertainment is one of

the main motivators for using social media, with most individuals using social media for humor and enjoyment, which is also part of the need for entertainment.

Apart from looking for fun, some individuals also access social media to pass the time. Since many social media platforms are designed for entertainment purposes, on which many pages become popular by posting funny texts, videos, or images, it is assumed that social networks have the potential to satisfy the entertainment need of users.

Also, the use of social networking sites is driven by users' personal identity needs or, similarly, personal integration needs. The need for personal identity is perceived as users' desire to present their true or inner self to the outside world and to have others know them as they know themselves.

Social networks offer many possibilities for expression, as users can create their own profiles, upload pictures and videos, and share information about themselves. To a certain extent, users can decide for themselves who they want to be or how they want to be perceived by others, as they are free to choose what they want to share. Thus, social networks provide the opportunity to create an identity that is different or similar to the one in real life.

Assuming that, social networks fulfill the informational, social, and professional needs of users, offering the freedom to know and shape their own image or personality in the

virtual environment, the following research hypothesis is issued:

Hyp1: The relationship between social media use and individual performance is mediated by the fulfillment of informational, social, and professional needs.

An important side effect is social media addiction, which can also be described as an internet addiction, where individuals show a compulsion to overuse social media, with the daily duration of social media site usage being an indicator of social media addiction. Social media use can be assumed to become addictive if it provides the user with positive feelings that encourage further use, such as rewards in the form of likes or access to restricted links. Thus, we can consider that problematic use of social networks has a negative effect on performance and well-being.

As such, social media use may not directly lead to decreased performance or well-being, but it may lead to negative side effects, which in turn may lead to decreased well-being. A side effect resulting from intensive use of social media is the emergence of anxiety or personality disorders, as users often sleep with their smartphones in the bedroom and are disturbed by incoming messages or perceive pressure and fear of losing relevant messages, which prevents them from to fall asleep or sleep well, with negative effects of an anxious nature.

Assuming the idea that an important predictor of individual well-

being is anxiety, we can formulate the following research hypothesis:

Hyp2: The relationship between social media use and individual well-being is mediated by the occurrence of

social media addiction and anxiety and personality disorders.

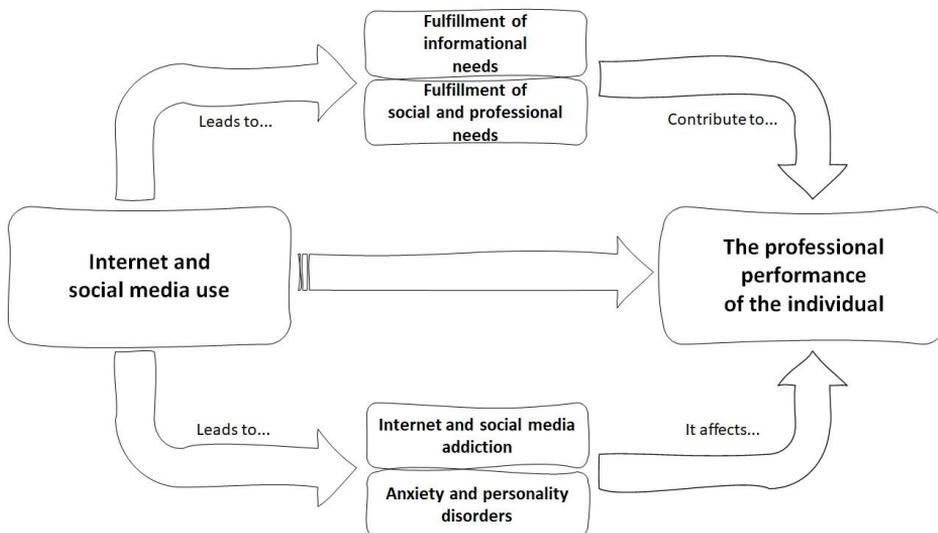


Fig 1. Theoretical research model

5. SCIENTIFIC RESEARCH METHODOLOGY

Based on the formulated research hypotheses we developed a research model containing possible mediators of social media use and individual performance (Figure 1). In this model, a positive influence of the use of social networks on the satisfaction of personal needs is assumed, as well as a negative influence on the well-being of the individual, generated by the secondary effects of the use of social networks.

In addition, need satisfaction is hypothesized to be positively related to performance, and generated side effects are negatively associated with job performance.

The establishment of the scientific research plan was achieved after the objective was defined and the research hypotheses were stated, this plan being structured in three stages.

Thus, in the first stage, investigating the specialized literature, the objectives of the scientific approach were represented by the identification and evaluation of the theoretical aspects related to social networks, respectively by the identification of the study tools of social networks. The use of scientific research tools led to the evaluation of

the psychological effects of social networks.

In the second stage, the objective was to achieve a state of the art, by identifying and evaluating reference studies related to social networks, with an emphasis on current affairs. In this context, several international studies on the chosen topic were analyzed.

In the third stage, the quantitative research, the evaluation of the relationship between the use of social networks and the performance of the individual, mediated both by the fulfillment of needs and by side effects, was carried out. For this purpose, a questionnaire was placed on a group of 316 civil and military employees from medical institutions and the factor analysis was carried out.

The researched collective was represented by adults, having the capacity of civil or military employee of a medical institution. The observation unit is represented in the research carried out by the person who provided the researcher with personal data and information and gave his consent to participate in the scientific research. The survey unit coincides in this research with the observation unit. The sampling method used in the quantitative study was simple random sampling. The selection of participants in the scientific research took into account two criteria, availability and accessibility.

The duration of completing the questionnaire, applied online, was

about 10-15 minutes. The data collection period was between January 1st, and February 29th, 2024. The collection method was online. A correlational survey design was chosen to conduct the research to answer the objective and purpose of the research as well as to test the four research hypotheses.

The independent variable chosen was the use of social networks (U), the dependent variable chosen was performance (B) and the mediating variables consisted of the fulfillment of users' needs, which were the fulfillment of informational needs (ND) and the fulfillment of social and professional needs (NP), respectively social media addiction (D) and anxiety and personality disorders (T). The participants completed the same online questionnaire, agreeing to the processing of the data for exclusively scientific and anonymous purposes.

The study comprised a group of 316 adults connected to social networks, the criteria for voluntary participation including the condition that their place of work was a medical institution. The questionnaire was distributed online. Non-random sampling was used to recruit participants by providing the link to the questionnaire. In addition, participants were recruited through the snowball technique, as participants were invited to share the study link with their friends.

By clicking on the link, the participants were directed to the online questionnaire, with an

invitation to complete the questionnaire and an information message regarding the acceptance of data processing for exclusively scientific and anonymous purposes. The participants were informed in advance that this questionnaire is addressed exclusively to employees of medical institutions.

The questionnaire applied to the group of respondents consisted of scales related to the use of social networks by the participants, the importance of their needs, the satisfaction of perceived needs, side effects, performance, and a demographic section. For reasons of consistency and analytical treatment, the items in sections A, B, C, D and E of the questionnaire were rated on a five-point Likert scale, ranging from 1= strongly disagree, to 5= strongly agree, for the construction of the mediation variables, the average score of each scale being used.

The importance of social and professional needs was measured with four items in section A, the importance of informational needs was measured with four items in section B, the occurrence of anxiety and personality disorders was measured with four items in section D with reference to the last year spent on social networks, and performance was assessed with five items in section E.

Occurrence of social media addiction was measured with six items in section C, items that were based on the Bergen Scale for Social Media Addiction (Andreassen et al., 2016),

but transformed into statements, using a scale Five-point Likert (1= strongly disagree to 5= strongly agree) instead of the original frequency scale, to make the study more consistent and not to mislead the participants. In section C of the questionnaire, the six items referred to the last year spent by the participants on social networks.

Two items in section F measured participants' social media use by asking about the number of days per week they use social media and the minutes per day spent on social media. To create the independent variable U, both elements were used, which were multiplied and converted into the number of hours spent per day by users on social networks.

The items in section A of the questionnaire were A1: For me, social media is important, because I feel that it is part of my image, at work and at home, A2: For me, social networks are important, to present or give my image to others, colleagues, or friends, A3: For me, social media is important because people can use it to rate me or get to know me, at work or in my free time, A4: For me, social media is important, to gain favorable approval, among colleagues or others.

The items in section B of the questionnaire were B1: For me, social networks are important, to inform me, B2: For me, social networks are important, to waste time, B3: For me, social networks are important, to learn, B4: For me, social networks are important, to relax.

The items in section C of the questionnaire were C1: Over the last year I have spent a lot of time thinking about social media or using it, C2: In the last year I felt the need to use social networks more and more, C3: In the last year I used social media to forget about my personal problems, C4: In the last year I have tried to reduce my use of social networks without success, C5: In the past year I have become restless or distressed if I have not been able to use social media, C6: In the past year I have used social media so much that it has had a negative impact on my professional activities or my ability to work.

The items in section D of the questionnaire were D1: In the last year I have had problems with anxiety, D2: In the last year I have sometimes felt anxious or felt that way all day, D3: In the last year I have had trouble falling asleep at night or had nightmares, D4: In the last year I have had mood swings, even every day.

The items in section E of the questionnaire were E1: I don't feel particularly happy with the way I am or present myself at work, E2: I am very satisfied with everything in my career and what I have done in my professional life, E3: I don't think I'm as good as others, E4: I am fine with any task I get, E5: I feel fully active mentally.

The items in section F of the questionnaire were F1: My gender is male/female, F2: My job is in a medical institution, F3: I have been a

user of social networks for years, F4: The device I mostly use to connect to social networks is a smartphone / laptop (PC) / other type of device, F5: I use social media a number of days a week, F6: I use social media a number of minutes a day.

In total, including the six demographic questions in section F, the questionnaire contained 29 items and took participants no more than 15 minutes to complete. To make the questionnaire more coherent, it was written from a first-person perspective. The obtained data set consisted of data from 307 participants, 184 women (60%) and 123 men (40%), responses from nine participants being excluded from the data set because they stated that they did not work in an institution in the field medical. The age of accepted respondents was between 20 and 65 years, and the mean age was 34 years (SD=4.8). Considering the characteristics of social media use, 298 participants stated that they access mobile networks via smartphone (97%) and nine respondents accessed social networks via laptop/PC (3%). On average, the respondents stated that they have been using social networks for about seven years (SD=2.3).

6. RESEARCH RESULTS. INTERPRETATION OF RESULTS

The answers obtained from the group of 316 respondents were first

analyzed from the content point of view, on which occasion the answers given by nine respondents were eliminated, as shown above. An exploratory factor analysis was performed to verify that the associated items were distinct from each other and unrelated to the same concepts, with no changes made to the originally developed scales.

Factor analysis was performed with 23 items belonging to the scales measuring the importance of the two needs, side effects and performance. Because social media use was measured by two string variables, they were not included in the factor analysis.

The scale measuring social media addiction showed good reliability, with a Cronbach's alpha coefficient $\alpha=0.78$ for the six items in section C. Regarding the assessment of needs, the four items of scale A of the questionnaire showed good reliability, with Cronbach's alpha coefficient $\alpha=0.83$.

At the same time, the scale made with the four items in section B showed good reliability, with Cronbach's alpha coefficient $\alpha=0.81$. Regarding side effects, the four-item scale in section D indicated good reliability, with Cronbach's alpha coefficient $\alpha=0.79$.

The five-item scale measuring performance in section E has good reliability, Cronbach's alpha coefficient being $\alpha=0.82$. On average, participants scored close to 4 on the independent variable U (social media

use), indicating that participants spend approximately four hours per day on social media.

However, as shown by the standard deviation, the differences between participants are large in terms of time spent on social media. The mean score on the dependent variable B (performance) was around 3, which shows an average level of performance.

Considering the descriptive statistics of the mediating variables belonging to the satisfaction of needs, it can be observed that the informational needs are fulfilled, to a greater extent than the social and professional ones, which were fulfilled through the using of social networks only to a small extent.

Looking at the side effects of social media use, participants scored on average high on social media addiction. None of the side effects appeared to be highly prominent in this sample, as none of the mean scores were greater than 3. The average participant could neither agree nor disagree if they experience one of the side effects of using social media.

To check how the variables are related to each other, Pearson correlations were performed. The correlation matrix showed insignificant correlations between the independent variable U and the dependent variable B. However, significant relationships could be found between the use of the

independent variable U and some of the mediating variables.

Thus, weak positive correlations could be observed between the use of the U variable and the informational and social and professional need satisfaction variables. *Regarding the secondary effects of social media use, a significant relationship, namely a weak positive correlation, was detected between social media use and social media addiction.*

In addition, correlations could be found between the mediators belonging to the secondary effects of social media use and performance. Anxiety and personality disorders, and social media addiction showed weak negative correlations with performance. *No significant relationship could be found between the mediating variables of need satisfaction and performance, but significant correlations were detected between the different mediating variables.*

Starting from the mediating variables belonging to need fulfillment, there was a weak positive correlation between informational need fulfillment, social and professional need fulfillment, and social media addiction. *Fulfillment of social and professional needs was weakly positively correlated with social media addiction.*

When considering the secondary effects of social media use, each of the associated mediating variables

showed significant correlations with each other. Anxiety and personality disorders were weakly positively correlated with social media addiction.

Overall, *no moderate or strong correlations could be found between any of the variables.*

Multiple mediation analysis was conducted to investigate whether the relationship between the independent variable U and the dependent variable B is explained by the mediators ND and NP and the negative side effects of social media use, namely anxiety and personality disorders, and social media addiction, respectively.

After revising the hypotheses through linear regressions, the hypotheses were tested, *finding that social media use positively affects user need satisfaction and the secondary effects of social media use. In addition, need satisfaction was found to positively affect user performance and side effects to negatively affect it.*

Therefore, different mediators should explain the negative and positive relationships between social media use and performance. At the same time, an insignificant relationship was found between the independent variable U and the dependent variable B.

The regression analysis showed significant relationships between the independent variable U and some of

the mediators. Participants who reported higher levels of social media use also reported significantly higher levels of need satisfaction.

Furthermore, *social media use is a significant and positive predictor of social media addiction.*

Considering the mediating variables and their influence on the dependent variable B, the secondary effects of social media use were found to be significant. Overall, no evidence was found that social media use has a beneficial influence on user performance, which rules out possible mediating effects.

Consistent with the theoretical model, *participants who reported higher levels of anxiety or personality disorders, or social media addiction reported lower levels of performance.*

7. CONCLUSIONS, LIMITATIONS OF RESEARCH AND FUTURE DIRECTIONS

Because the scientific management literature is divided on the likelihood that online social media use will lead to Internet or social media addiction, anxiety or personality disorders, or impaired performance, the purpose of this scientific paper was to find the conditions that explain this relationship.

Therefore, through the scientific study carried out, the authors of the

paper aimed to investigate to what extent the satisfaction of needs and the negative side effects of the use of online social networks can explain the relationship between the use of social networks and the emergence of addiction to them or if this fact affects the professional performance of users, respectively of employees, civil or military, from institutions in the medical field.

The results obtained indicated that the use of social networks can lead to addiction or the emergence of anxiety or personality disorders and does not have a significant influence on the performance of users. However, regression analysis showed that medical employees who spend more time on social media have need fulfillment, even if they perceive higher levels of informational, social, or professional.

In addition, higher levels of social media use were associated with higher levels of social media addiction in healthcare workers. Another important finding was that users experiencing higher levels of anxiety and personality disorders, or social media addiction, reported significantly lower levels of job performance.

The results are similar to those of other studies that did not find a direct association between social media use and mental health among young adults (Ali et al., 2020).

However, the results fit the theoretical model, with social media use being significantly related to satisfying informational, social, or professional needs. Thus, social media use is a significant positive predictor of need fulfillment and social media addiction.

In this study, online social networks had the potential to meet users' entertainment and personal identity needs to a certain extent. This is in accordance with a study by Wang et al. (2019), who found that online social networks satisfy users' needs. Additionally, they found that user needs accumulate over time and drive social media use in the future.

Therefore, it cannot be ruled out that the relationship between social media use and need satisfaction is bidirectional, as it may be that high-need users automatically spend more time on social media because they feel a stronger need for satisfaction.

This suggestion is underscored by the fact that none of the mediating variables belonging to need satisfaction was significantly associated with performance. Thus, it can be concluded that need fulfillment has no influence on users' performance, but it could predict users' further use of social media.

By the secondary effects of online social media use, social media addiction was positively predicted by social media use. The

participants already had a lot of experience in using social media, as they had been using it for many years. Therefore, it could be suggested that they are aware of the risks of using social media, which could protect them from developing negative side effects.

Notably, social media addiction is the only variable that is significantly related to both social media use and performance, and thus meets at least some of the criteria for being a mediator.

Correlations showed significant relationships between information need satisfaction and social media addiction.

Al-Menayes (2016) found that satisfaction with time spent on social media is positively related to social media addiction, which further leads to worsened performance. In conclusion, it appears that need satisfaction triggers further social media use, which in turn may lead to more social media addiction.

These results show that users of social networks should become aware of why they use them and ask whether using social networks is the only way to satisfy informational, social, and professional needs.

For example, medical institutions should offer alternatives to meet these needs, such as informative or training programs to meet informational, social, and professional needs, to prevent the

development of social media addiction.

In general, attention should be directed to anxiety and personality disorders because they significantly decrease the performance of the employee, civilian or military.

Regarding limitations, the respondent pool was relatively small, and the measure for social media use could be improved, as users may show differences in online social media interaction, not measured by time spent per week.

Results were based on participants' self-reported estimates, which may not be an accurate and reliable indication of actual screen time, and participants may not be fully capable of properly assessing their needs, as some of these may be unconscious stimuli for social media use, and participants may not be completely honest about their responses. So, the results could be biased.

Future research should focus on hypothesizing a bidirectional relationship between social media use and individuals' need satisfaction, which could lead to social media addiction. In addition, researchers should be open to different study designs, including experience sampling, and adding a control group to obtain stronger results.

Particular attention should be paid to the measures of using online

social networks that must be met, in order to increase reliability. Also, more studies should be conducted in different population groups, including the elderly, with less experience in using social media, to identify differences between different users.

The importance of the research is highlighted by the design and implementation of an original research model for the study of phenomena that transcend the intensive use of social networks and the induced psychological effects, including addiction to online social networks, in the post-pandemic context of COVID-19, at the level of employees from the medical field.

At the same time, the scale developed by the authors, based on their own research model, is useful in studying the dependence on social networks of civil and military employees of these institutions.

In addition, the addiction to social networks could be identified as a risk factor of their use, the study demonstrating the connection between the use of social networks and the change in the level of professional performance.

REFERENCES

- [1] Adams,S.K., Murdock,K.K., Daly-Cano,M., Rose,M. (2020). Sleep in the social world of college students: bridging interpersonal stress and fear of missing

- out with mental health, *Behav. Sci.* 10(2) 54, doi: 10.3390/bs10020054
- [2] Al Abri,A. (2017). Where is the party tonight? The impact of fear of missing out on peer norms and alcohol expectancies and consumption among college students. *Doctoral Dissertations.* 1352
- [3] Ali,I., Danaee,M., Firdaus,A. (2020). Social networking sites usage&needs scale(SNSUN):A new instrument for measuring social networking sites' usage patterns and needs. *Journal of Information and Telecommunication,* 4(2), 151-174. doi:10.1080/24751839.2019.1675461
- [4] Al-Menayes,J. (2016). The fear of missing out scale: validation of the Arabic version and correlation with social media addiction, *Int. J. Appl. Psychol.* 6(2) 41-46, doi: 10.5923/j.ijap.20160602.04
- [5] Alt,D. (2015). College students' academic motivation, media engagement and fear of missing out, *Comput. Human. Behav* 49 111–119, doi: 10.1016/j.chb.2015.02.057
- [6] American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (5th ed.)*. ISBN 978-0890425541
- [7] Andreassen,C.S. (2015). Online social network site addiction: A comprehensive review. Technology and Addiction (M Griffiths, Section Editor). *Current Addiction Reports.* 2, 175-184. doi: 10.1007/s40429-015-0056-9
- [8] Andreassen,C.S., Pallesen,S., Griffiths,M.D. (2016). The relationship between addictive use of social media, narcissism, and self-esteem: Findings from a large national survey. *Addict Behav. Epub* PMID: 27072491. 64:287-293. doi: 10.1016/j.addbeh.2016.03.006
- [9] Andreassen,C.S., Torsheim,T., Brunborg,G.S., Pallesen,S. (2012). Development of a Facebook Addiction Scale. *Psychol Rep.* 110. doi: 10.2466/02.09.18.pr0.110.2.501-517
- [10] Bakioğlu,F., Deniz,M., Griffiths,M.D. et al. (2022). Adaptation and validation of the Online-Fear of Missing Out Inventory into Turkish and the association with social media addiction, smartphone addiction, and life satisfaction. *BMC Psychol* 10,154. doi:10.1186/s40359-022-00856-y
- [11] Böhmer,J.F. (2022). Social media use and its relationship with well-being. The associations between social media use, need fulfilment, negative side effects, and well-being. University of Twente. *Positive Clinical Psychology and Technology Essays.* 91615.7(7)
- [12] Brand,M. (2022). Can internet use become addictive?. *Science.* 376. 798-799. doi: 10.1126/science.abn4189
- [13] Camargo,L., Herrera-Pino,J., Shelach,S., Soto-Anari,M., Porto,M.F., Alonso,M., Gonzalez,M., Contreras,O., Caldichoury,N., Ramos-Henderson,M., Gargiulo,P., Lopez,N. (2023). Escala de Ansiedad Generalizada GAD-7 En Profesionales Medicos Colombianos Durante Pandemia de COVID-19: validez de Constructo y Confiabilidad, *Rev. Colomb. Psiquiatr.* 52 (3) 245-250, doi: 10.1016/j.rcp.2021.06.003
- [14] Carmona-Halty,M.A., Schaufeli,W.B., Salanova,M. (2019). The Utrecht work engagement scale for students (UWES-9S): factorial validity, reliability, and measurement invariance in a Chilean sample of undergraduate university students. *Front. Psychol.* 10. doi: 10.3389/fpsyg.2019.01017
- [15] Chandani,A., Daji,A., Sawhney,A., Mehta,M., Islam,T., Prakash,P., Neeraja,B. (2019). The relationship between mobile phone & laptop use on physical well-being of college students in

- India. *Indian Journal of Public Health Research & Development*, 10(8).
- [16] Chashmi,S.J.E., Aruguete,M., Sadri,M., Montag,C., Shahrajabian,F. (2023). Psychometric properties of the fear of missing out (FOMO) Scale in iranian students: Reliability, validity, factor structure, and measurement invariance. *Telematics and Informatics Reports*, Volume 10, 100066, ISSN 2772-5030, doi: 0.1016/j.teler.2023.100066
- [17] Chotpitayasunondh,V., Douglas,K.M. (2018). The effects of phubbing on social interaction. *Journal of Applied Social Psychology*. 48(6): 304-316. doi: 10.1111/jasp.12506
- [18] Dutot,V. (2020). A social identity perspective of social media's impact on satisfaction with life, *Psychol. Mark.* 37(6) 759-772, doi: 10.1002/mar.21333
- [19] van den Eijnden,R.J.J.M., Lemmens,J.S., Valkenburg,P.M. (2016). The social media disorder scale. *Computers in Human Behavior*, 61, 478-487
- [20] Elhai,J.D., Levine,J.C., Alghraibeh,A.M., Alafnan,A.A., Aldraiweesh,A.A., Hall,B.J. (2018). Fear of missing out: testing relationships with negative affectivity, online social engagement, and problematic smartphone use, *Comput. Human. Behav* 89 289-298, doi:10.1016/j.chb.2018.08.020
- [21] Fang,J., Wang,X., Wen,Z., Zhou,J. (2020). Fear of missing out and problematic social media use as mediators between emotional support from social media and phubbing behavior, *Addict. Behav* 107 106430, doi: 10.1016/j.addbeh.2020.106430
- [22] Gil,F., Oberst,U., Del Valle,G., Chamorro,A. (2015). Nuevas tecnologías - ¿Nuevas patologías? El smartphone y el fear of missing out, *Aloma* 33 77-83, doi: 10.51698/aloma.2015.33.2.77-83
- [23] Jung,S.Y., Kim,J.N. (2014). Development and validation of SNS addiction proneness scale for college students. *Kor J Psychol Health* 19:147-166
- [24] Kim,Y., Kim,B., Hwang,H.S., Lee,D. (2020). Social media and life satisfaction among college students: A moderated mediation model of SNS communication network heterogeneity and social self-efficacy on satisfaction with campus life. *The Social Science Journal*, 1-16.
- [25] Ko,T., Turan,A.H. (2020). The relationships among social media intensity, smartphone addiction, and subjective well-being of Turkish college students. *Applied Research in Quality of Life* (4)
- [26] Landa-Blanco,M., Reyes García,Y., Landa-Blanco,A.L., Cortés-Ramos,A., Paz-Maldonado,E. (2024). Social media addiction relationship with academic engagement in university students: The mediator role of self-esteem, depression, and anxiety, *Helijon*, Volume 10, Issue 2, ISSN 2405-8440, doi: 10.1016/j.helijon.2024.e24384
- [27] Lei,H., Chiu,M.M., Li,S. (2019). Subjective well-being and internet overuse: A metaanalysis of mainland Chinese students. *Current Psychology* (New Brunswick,N.J.),1-11
- [28] Li,Y.Y., Huang,Y.T., Dou,K. (2021). Validation and psychometric properties of the Chinese version of the Fear of Missing Out Scale, *Int. J. Environ. Res. Public. Health* 18(18) 9896, doi:10.3390/ijerph18189896
- [29] Ma,J.P., Wang,C.X., Ye,Y. (2021). Development and validation of fear of missing out scale among Chinese college students, *Curr. Psychol* 41 1-10,doi:10.1007/s12144-021-01357-8
- [30] Pang,H. (2018). How does time spent on WeChat bolster subjective well-being

- through social integration and social capital? *Telematics and Informatics*, 25, 2147–2156
- [31] Przybylski,A.K., Murayama,K., DeHaan,C.R., Gladwell,V. (2013). Motivational, emotional, and behavioral correlates of fear of missing out, *Comput. Human. Behav* 29(4) 1841-1848, doi: 10.1016/j.chb.2013.02.014
- [32] Rozgonjuk,D., Sindermann,C., Elhai,J.D., Montag,C. (2020). Fear of Missing Out (FoMO) and social media’s impact on daily-life and productivity at work: do WhatsApp, Facebook, Instagram, and Snapchat Use Disorders mediate that association? *Addict. Behav* 110 106487, doi: 10.1016/j.addbeh.2020.106487
- [33] Sela,Y., Zach,M., Amichay-Hamburger,Y., Mishali,M., Omer,H. (2020). Family environment and problematic internet use among adolescents: the mediating roles of depression and fear of missing out. *Comput. Human. Behav* 106 106226, doi: 10.1016/j.chb.2019.106226
- [34] Sette,C.P., Lima,N.R.S., Queluz,F.N.F.R. et al. (2020). The Online Fear of Missing Out Inventory (ON-FoMO): Development and Validation of a New Tool. *J. technol. behav. sci.* 5. 20–29. doi: 10.1007/s41347-019-00110-0
- [35] Shin,N.Y., Lim,Y.J. (2018). Development and validation of a social network site use motives scale for college students in South Korea. *J Psychoeduc Assess* 36:808-815
- [36] Tsai,H.Y.S., Hsu,P.J., Chang,C.L., Huang,C.C., Ho,H.F., LaRose,R. (2019). High tension lines: negative social exchange and psychological well-being in the context of instant messaging, *Comput. Human. Behav* 93 326–332, doi: 10.1016/j.chb.2018.12.034
- [37] Veysuei,M., Amini,M., Fattahi,A., Mojarad,S.M. (2023). Psychometric properties of the Farsi version of the Fear of Missing out Scale and the Phubbing Scale. *Iran J Psychiatry Behav Sci.* 17(1):e122357. doi: 10.5812/ijpbs-122357
- Wang,J., Wang,P., Yang,X., Zhang,G., Wang,X., [38] Zhao,F., Zhao,M., Lei,L. (2019). Fear of missing out and procrastination as mediators between sensation seeking and adolescent smartphone addiction, *Int. J. Ment. Health. Addict* 17 1049–1062, doi:10.3389/fpsy.2020.00877
- [39] Wegmann,E., Oberst,U., Stodt,B., Brand,M. (2017). Online-specific fear of missing out and Internet-use expectancies contribute to symptoms of Internet-communication disorder, *Addict. Behav. Rep* 5 33–42, doi: 10.1016/j.abrep.2017.04.001
- [40] Whelan,E., Islam,A.N., Brooks,S. (2020). Applying the SOBC paradigm to explain how social media overload affects academic performance, *Comput. Educ* 143 103692, doi: 10.1016/j.compedu.2019.103692
- [41] Zhang,Z., Jiménez,F.R., Cicala,J.E. (2020). Fear of Missing Out Scale: a self-concept perspective, *Psychol. Mark.* 37(11) 1619–1634. doi: 10.1002/mar.21406
- [42] Zhao,L. (2021). The impact of social media use types and social media addiction on subjective well-being of college students: A comparative analysis of addicted and non-addicted students. *Computers in Human Behavior Reports*, Volume 4, 100122, ISSN 2451-9588, doi: 10.1016/j.chbr.2021.100122

THE ROLE OF ENVIRONMENT IN MOLDING INDIVIDUAL BEHAVIOR. STRUCTURAL- ECOPSYCHOLOGICAL APPROACHES

Maria Dorina PASCA

George Emil Palade University of Medicine, Pharmacy, Science, and
Technology of Targu Mures, Romania

“Human beings spend ten years as little children, and, unable to distinguish between death and life, they spend ten more years holding on to learning... they spend another ten years chasing after gain and acquiring wealth, in order to live on it. They spend another ten years to reach the end of the time, in which their mind has come to skill”. Papyrus Insigner, VII, 22-23, XVIII 1-2 (after Pașca M.D.2019).

In the realm of human development, the term ecopsychology makes the transition from nature to the human being, but especially to the nature of the human being, of their development, taking into account the environment: natural; psychological; social; educational; spiritual; medical; economic; environmental; of origin; of reference, etc., in/to which we find ourselves or wish to find ourselves and which identifies us in this case as a matrix, a personal imprint, giving us the stamp of uniqueness. The environment along with heredity and education has its own social identity and acts as a factor in human development. It represents an accumulation of value where the complex triad: man-nature-society determines its expression as an imprint of human evolution in an informed way, highlighting the formula of social environment.

Key words: *ecopsychology, environment, environmental psychology, family, community, education.*

1. INTRODUCTION

The ecopsychological approach, highlights, in a striking way, the way in which the environment, in all its aspects of expression, is part of the equation of interdisciplinarity, a fact also demonstrated in the various forms of

knowledge of the whole complex of evolution, as a reference to identity and concepts, starting from the human personality as a benchmark of both vertical and horizontal transformations of the society to which we refer, legitimating in this case, the

involvement, as a sine qua non result, of the universal matrix. The approach takes into account several aspects as contributors to individual behaviors, namely: family; education and community. We will dwell on each of the above underlining how they mold human beings and their behavior in various circumstances.

2. THE ROLE OF FAMILY

The family is a whole, in which each of its members identifies as such. The environment; stability; tranquillity; atmosphere; warmth; harmony; love; respect; friendship; safety; acceptance; misunderstanding; coldness; rigidity, but, above all, understanding are the elements that create the environment of the family, a pattern or matrix that plays an important role in the future of its members.

However, there are families in which both the environment: natural; social; educational; medical; spiritual; economic; family, is part of the "recipe" of the disadvantaged where the gaps lead to: risky behaviour; affective behaviour; physical abuse; psychological abuse; physical and psychological aggression, under all spectra, so the element of ecopsychology will leave deep imprints in relation to: self-confidence; self-esteem; self-image; quality of life; identity as an individual, and will trigger attitudes and behaviors, which may at some point become delinquent.

In this context, the maintenance of a family balance is the normality from all

points of view, so that the structural-ecopsychological model is the most plausible to follow and apply, starting from the cause to the effect.

It is obvious that a family has a personality well defined by its members, hence its security and stability over time; space; identity must certify its evolution and value, which makes it, in all its complexity, the basic cell of society.

Holmes I (2001) notes that the family, namely, family relationships have a life of their own, for it is more than the sum of the lives of family members. For these relationships to be successful, we need to take them seriously (which means laughing at them sometimes). We need to think about what is best not only for 'me' or 'you' but also for 'us'. The author sets out to present us with the "Decalogue" of family life, which, followed, will significantly change the mood and atmosphere in a family. So, according to him, we should: put intimate family relationships at the center of our being; be loyal to our family, since it is the only one we have; if we are unhappy because of our family or our relationships with our family, we should not just grumble, but trust that our family will listen to what we have to say; take the time to communicate with our family, to share our feelings and to solve problems and difficulties together; respect the cycle of generations, for we are a link in a chain that stretches far into the past and into the future; not deny, reject or take the feelings of

another person lightly, and if we do, we kill the emotional life of your relationship; recognize the power of sexual jealousy within the couple, because nothing is more demoralizing to a man than feeling sexually rejected; express our feelings sincerely towards our partner and family; be aware of the power of envy, we should not involve a third person in our relationships nor our children in the bitterness we are experiencing; not waste time comparing our relationship with others, but also value ourselves and our own capacity to give and receive love.

3. THE ROLE OF EDUCATION

The school environment impacts human behavior in terms of ecopsychology. In this respect, we will revisit a number of authors whose remarks will certainly find their echo in terms of education in: family; school; community.

Thus, according to St. John Chrysostom:

- Education must be done early: "If we build good principles in the child from the beginning and from an early age, no more strenuous efforts are needed afterwards, for habit will be the law for children in the future".

- Education must be done gradually, with discernment and wisdom: "Do not teach the new-born the perfect flight in one day, but at first only take them out of the nest,

then, another time, teach them to fly close to the ground and only after they have rested, another time teach them to fly higher and thus, little by little, you will lead them to the right height".

- Education must be done with love, mercy and inner joy: "With paternal mercy, with skilful speech, let the mistakes of the young be corrected".

- Love must not have so much an element of denial as of positivity; it is not so much necessary to prohibit as to highlight the positive.

- The mentor must be gifted with the talent of telling different stories.

Thus, it is necessary to educate the child correctly and honestly, not to create an imaginary society that does not correspond to reality. It is our duty to reveal to them both the good and the bad of society, and much realism is needed. "The child must be neither very soft nor wild in character, but manly and at the same time, gentle in his thinking".

The education of children requires great discernment on the part of the teacher; discernment consists in not disappointing the children, but also in avoiding leaving them uncorrected by encouragement: "This (the living breath - thymos - affectivity as a psychic function) must not be allowed to be used anywhere without discernment. We must train

young people in such a way from an early age that, when they are wronged themselves, they will bear it and not get angry, and when they see another who is wronged, they will intervene, with courage and support him with appropriate means".

Concerning punishment, reprimands, checks: "The child on whom no limitations have been imposed is deeply deceived as to the reality of life. Parents keep this child in an incubator of an imaginary world, and when he comes into contact with the real world, where there are restrictions, he will be totally unprepared and unable to cope with it.

In this context, by applying the simple but wise teachings, our children who have become pupils, schoolchildren, should no longer have to face bullying behaviors, because respect combined with education would annihilate all the "temptations" of non-education.

Holmes I (2001) suggestively captures the moment when children become teenagers and grow apart from their parents. Teenagers blame their parents for their own frustrations and disappointments. From the teenager's perspective, parents can be: boring; stingy; restrictive; uninteresting, or/and neglectful; treat them like a small child; abuse them; tell them what to

do; don't love them enough, or don't care about them at all.

Similarly, parents blame their children for: they see their home as a hotel; they go out too often; lie in bed all day; don't do anything around the house; and in general, that it causes them sleepless nights and disappointment.

This captures how both the child and the parent look in the same mirror, but see something else.

Starting from these desires, we can eliminate through strategies appropriate to ecopsychology: anxieties; fear of the unexpected; depression; emotional deficiencies; dissatisfaction; anxiety; maladjustment; emotional instability, but above all, fears for apathy and maintenance of behavioral disorders with antisocial and criminal risk to which, our reaction delayed in time, no longer have an effect.

4. THE ROLE OF COMMUNITY

Looking at community as a sum of social acquisitions, we try to admit the existence of elements of ecopsychology at the level of: the workplace; social assistance; deprivation of freedom; defence, captured as a way of logistical expression, in accordance with the development of the relationship with the environment specific to each

cognitive sequence, and the human factor, existing in different work-evolutionary hypostases, at the time of the bio-psycho-social impact on nature and the surrounding world.

Thus, the workplace is a propitious space where the existence and development of professional, collegial and hierarchical (especially vertical) relationships have a strong impact on the employee and the employer, obviously in different ways. Prefigured, in the form of: firms; companies; institutions; agencies, the workplace presupposes the existence of, but also the mutually agreed observance of: rules of internal order; professional ethics; confidentiality; customs; professional hierarchy; working hours (timetable and days), so the formation of "work patterns" leads to the existence of: conduct; attitudes; behaviours, aimed at a new perception of the world by the employee, who succeeds in transferring some of the strategies applied in the workplace to his own personality, but also to his family, and the results are always beneficial.

Even if some companies/corporations/firms manage to find various creative incentives for their employees in order to increase their: productive capacity; output; creativity; imagination; cognitive processes; comfort; finding means such as: high wage income; facilities for oneself; facilities for the family; training; domestic and international travel; office holidays; early

promotions; unconventional workplaces, etc, it is sometimes forgotten that the person in question needs to be made aware of his or her value as an individual and a professional by increasing: self-esteem; self-confidence; self-image, the employee's personality as a matrix of development and value in the workplace.

Therefore, the way in which the employer makes sure not to forget that the function is one and the profession/job is another, the ethical-moral-economic return will be maximum, and the efficiency of the partnership and collaboration relationship, based on mutual respect, will be the basis of social success at company level, identifying itself by its uniqueness.

For example, in the defence field, military activities/actions are primarily aimed at maintaining peace and demarcating conflict areas so that, where armed intervention is required, it will cause as little damage as possible to the eco-system concerned, restoring order and peace to the site.

Even though it is said that "The best weapon of defence is the attack" and "In wartime, parents bury their children", armed intervention needs to take into account: geographical area; the political system; season; conflict zone; media involvement; media impact; social policies; health policies; education system; economic development; climate; population; wealth; traditions;

customs; customs, so that an ecological disaster does not occur through the armed act as such, because a geo-political imbalance, as natural as it is very close to occurring, the repercussions could transform the planet.

From an ecopsychological point of view, some elements that appear in combatants who have spent long periods of time in: military operations; theatres of war; direct armed attack; natural disaster zones; imprisonment; bunkers; tunnels; mined areas; disused areas; field hospitals; arrest; deprivation of liberty, can be highlighted. They are particularly evident in their communication and relationship with: family members; friends; relatives; military personnel; other related structures; acquaintances, etc.. Their behaviors may be prove them to be introverts; irritable; undisciplined; aggressive; violent; careless; anxious; panicky; disobedient, and often seeking an oasis of calm and deliberate isolation, to temper and/or annihilate such affective-volitional and attitudinal-behavioral states evident by their appearance at a given time. The specialists working with them should demonstrate calm and firmness; understanding and acceptance; decision and competence; responsibility and fairness, but above all respect and honour.

In the aspects thus captured, the community relates to the requirements of society, the environment also being the linking element between its

members and the surrounding world in all its aspects.

Prevention can and often is the source of elimination of some problematic situations that can impact the social order, Rădulescu S.M. (1999) by:

- threatening the economic well-being of members of society: poverty; unemployment; social inequality;

- affecting the social order and the requirements of social conformity, jeopardising the values protected by law in the case of violence; crime; juvenile delinquency; aggression;

- damaging the balance of the physical and ecological environment through urbanization; globalization; industrialization; pollution; global warming; climate imbalances;

- threatening the physical, mental and social well-being of the human community as a result of overpopulation; demographic imbalance; AIDS; cancer; rare diseases; epidemics; pandemics; armed conflict; conflict zones; war; poverty,

- discriminating against individuals, generating inequality based on: gender; age; religion; ethnic origin; educational, social or marital status; political affiliation;

- expanding into global social issues with international impact: zonal conflicts; wars; state terrorism; mafia networks; guerrilla groups;

Thus, it can be noted that any social problem is defined according to several criteria and frames of reference, as well as conflict

perspectives, so that what is a problem for some social groups is a solution for others (e.g. crime or/and criminality is an important social problem, but from the perspective of some criminal groups it is not a problem, but a solution, that of acquiring goods, even if they come by illicit means and cause moral damage).

Certainly, the social problems of a community are inherent, but if we take into account: social change; social modernization; the cultural gap; social conflict, we wouldn't develop and we wouldn't have any problems. If change really came from us, then we should not forgetting that "It's not the country that needs changing, it's our way of being".

5. CONCLUSIONS

The ecopsychology is an interdisciplinary and transdisciplinary field that focuses on the synthesis of ecology and psychology in the promotion of sustainability, as distinct from conventional psychology, because it focuses on the study of the emotional connection between people and the Earth.

Popescu-Neveanu P. (1991) points out that human ecology attaches importance to both the physical and biological aspects of the environment, respectively, the constructive-cultural-emotional characteristics, as well as the ways

in which groups react to these characteristics.

According to Tomşa I.R. (2000) the ecopsychology is a new science and a new attitude, a frontier one, which brings together elements of: philosophy; human psychology; cosmology; ecology, in a new perspective on human beings and the planet.

The fundamental idea of this new science is that, by its very essence, the human being is a part of nature and argues that our deep and abiding essence includes a part of nature, of life, inseparable from physical nature. Thus, ecopsychology is the science of the relationship between individuals and the world.

Thus, ecology and psychology have the same goal - natural harmony with nature, creating a new attitude, that of solidarity, so that ecopsychology becomes the science of authentic "natural" relationships, helping primarily to change the human being in all its complexity, in a given favourable or unfavourable conjuncture.

REFERENCES

- [1] Athanasiu A. (1983)- Elemente de psihologie medicală, Bucureşti
- [2] Bonchiş E. (2006) – Teorii ale dezvoltării copilului, Ed. Dacia, Cluj Napoca
- [3] Bronfenbrenner U. (1979)- The ecology of human development, Harvard University Press

- [4] Berndt Th. (1997) – Child development, Editura Brown- Benchmark, Chicago
- [5] Coruțiu G. (1998)- Bazele psihologice ale practicii medicale, Ed. Imprimeriei de Vest, Oradea
- [6] Dasen P, De Ribeaupierre A (1987) – Neo-pia-getian theories, Cross-Cultural and diferential perspective, in International Journal of Psychology
- [7] Dobre C. (2003) – Psihologia mediului – provocările momentului, articol – <http://dsdro.ro>
- [8] Evans C. A. (2020)- Asociația Americană de Psihiatrie (AAP) – eco-anxietatea
- [9] Gheorghe Fl. (2003) – Fenomenologia penitenciară, Editura Oscar Print, București
- [10] Holmes J. & Ros (2001) – Ecologia stărilor sufletești; ghidul buneii dispoziții, Editura Humanitas, București
- [11] Iamandescu I. B. (1997)- Psihologia medicală, Editura Info Medica, București
- [12] Iamandescu I.B. (2000)- Dimensiunea psiho-socială a practicii medicale, ed. Info Medica, București
- [13] Lerner R. M. (1986) – Concepts and theories of human development, Random House- New York
- [14] Lăzărescu M. (1999) – Psihologia clinică, Editura Helicon, Timișoara
- [15] Muntean A. (1994) – Stadiile dezvoltării, Editura Augusta, Timișoara
- [16] Muntean A. (1997) – Stadiile dezvoltării, Editura Augusta, Timișoara
- [17] Miclea M., Radu I. (1991) – Creativitatea și arhitectura cognitivă, Editura SINCRON, Cluj Napoca
- [18] Popescu G., Rădulescu S.M. (1981) – Medicina și colectivitățile umane, Editura Medicală, București
- [19] Popescu – Neveanu P. (1991) – Dicționar de psihologie, Editura Albatros, București
- [20] Pădurean A. (2023)- Psihologia ecologică, www.prezi.com
- [21] Pașca M.D. , Tia T. (2007) – Psihologie și consiliere pastorală, Editura Reîntregirea, Alba Iulia
- [22] Pașca M.D. (2019) – Texte și ... pretexte, Editura Ardealul, Tg Mureș
- [23] Pașca M.D., Tia T. (2024) – Psihologie pastorală aplicată, Editura Renașterea, Cluj Napoca
- [24] Rădulescu S.M. (1999) – Devianță, criminalitate și patologie socială, Editura Lumina Lex, București
- [25] Reigel K.F. (1979) – Foundations of dialectical psychology, Academic Press, New-York
- [26] Super C.,Harkness S. (1997) – Basic processes on human development – vol. 2 – Allyn an Bacon, Boston, USA
- [27] Simion D. (2018) – Psihologia environmentală și elemente de psihologie socială aplicată în arhitectură și design – articol, Universitatea Tehnică, Republica Moldova
- [28] Sillamy N. (1996)- Dicționar de psihologie, Editura Univers Enciclopedic, București
- [29] Șchiopu U., Verza E. (1981) – Psihologia vârstelor, Editura Didactică și Pedagogică, București
- [30] Tomșa I.R. (2010) – ecopsihologie – cum vindecăm întrăinarea de restul creației, Editura Orfeu, București
- [31] Troadec B., Martinot C. (2003)- Le development cognitiv, Theories actualles de la pensee en contextes, Editura Beliu, Paris
- [32] Tudose Fl. (2000) – O abordare modernă a psihologiei medicale, Editura Info Medica, București
- [33] Tudose Fl (2003) – Orizonturile psihologiei medicale, Editura Medicală, București

CONSIDERATIONS REGARDING THE EVOLUTION OF GROSS DOMESTIC EXPENDITURE ON R&D (GERD) IN ROMANIA AND EU COUNTRIES.

PART I- TIME SERIES INDICATORS

Cristina ANTONOAI

The Regional Department of Defense Resources Management Studies
(DRESMARA), Brasov, Romania

The Gross domestic expenditure on R&D (GERD) is one of the most important indicators of the Research and Development area, part of Science and Technology and Digital Society branch on the data navigation tree of the EUROSTAT Database. In this paper we analyzed the evolution of GERD in Romania and EU countries on the last ten years with the available data (2013-2022).

Key words: GERD, time series, indicators, sectors of performance

1. INTRODUCTION

Gross domestic expenditure on R&D (GERD) at national and regional level provides users with data about R&D expenditure and R&D personnel broken down by the following institutional sectors: business enterprise (BES); government (GOV); higher education (HES); private non-profit (PNP), total of all sectors.

2. METHOD

For the analysis of the data we used the relative and average indicators of time series for the years 2013 to 2022. First we calculated the

dynamic indices with fixed base

$$i_{t/1\%} = \frac{y_t}{y_1} \cdot 100 \quad (1)$$

and the dynamic indices with

$$i_{t/t-1\%} = \frac{y_t}{y_{t-1}} \cdot 100 \quad (2)$$

chain base. Second we calculated the changing rates of dynamic rhythms with fixed base

$$r_{t/1\%} = (i_{t/1} - 1) \cdot 100 \quad (3)$$

and the changing rates of dynamic rhythms with chain base.

$$r_{t/t-1\%} = (i_{t/t-1} - 1) \cdot 100 \quad (4)$$

Third, we calculated the mean

$$\bar{y} = \frac{\sum_{t=1}^n y_t}{n} \quad (5), \text{ the average of absolute change}$$

$$\bar{\Delta} = \frac{\sum_{t=2}^n \Delta_{t/t-1}}{n-1} = \frac{\Delta_{n/1}}{n-1} \quad (6), \quad \text{the}$$

average of dynamic indices

$$\bar{i} = \sqrt[n-1]{\prod_{t=2}^n i_{t/t-1}} = \sqrt[n-1]{i_{n/1}} \quad (7) \quad \text{and}$$

the average rhythm of changing

$$\bar{r}_{\%} = \bar{i}_{\%} - 100 \quad (8).$$

3. RESULTS AND DISCUSSION

3.1. All sectors of performance

Regarding GERD by sector of performance in all sectors in Romania we obtained for the average indicators of time series the results in Table 1.

Table 1 Average indicators of time series for all sectors in Romania

the mean	924.173
the average absolute change	82.894
the average of dynamic indices	1.099
the average rhythm of changing	9.894

In Romania the annual mean of GERD in all sectors is 924.173 million euro per year. From one year to another we have on average an increase of 82.894 million euro. This increase represents 9.894% or an increase by a factor of 1.099.

We made also a graphical comparison between the data from Romania and the composite average at the level of EU-27, as we can see in Figure 1.

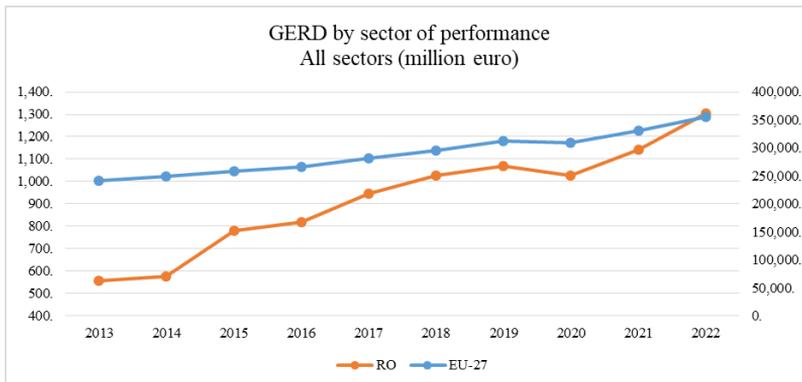


Fig. 1 The evolution of GERD in all sectors in Romania and EU-27

In Table 2 to Table 4 we have calculated the dynamic rhythms with fixed base and with chain base. We can observe that in Romania in 2016 compared to 2013 we have an increase with 46.736% of the GERD. This increase was the maximum value

between all the EU-27 countries. Also in 2017 compared to 2013 we have a maximum increase of 69.408%. The same for 2018 compared to 2013 – 83.727% increase.

Table 2 Dynamic rhythms with fixed base and with chain base (a)

R	2014/ 2013	2015/ 2013	2015/ 2014	2016/ 2013	2016 /2015	2017 /2013	2017/ 2016
MIN	-12.056	-9.174	-6.775	-21.011	-30.890	-14.194	-1.308
Country	EE	FI	FI	LV	SK	SI	DK
MAX	27.439	63.022	38.475	46.736	15.863	69.408	24.909
Country	BG	BG	SK	RO	CY	RO	LV

Table 3 Dynamic rhythms with fixed base and with chain base (b)

R	2018/ 2013	2018/ 2017	2019/ 2013	2019/ 2018	2020/ 2013	2020/ 2019
MIN	-4.522	-3.165	0.464	1.567	3.719	-4.689
Country	SI	SE	FI	DK	FI	IT
MAX	83.727	35.025	105.074	23.884	112.230	16.228
Country	RO	LV	PL	EE	PL	LT

Table 4 Dynamic rhythms with fixed base and with chain base (c)

R	2021/ 2013	2021/ 2020	2022/ 2013	2022/ 2021
MIN	12.073	2.326	18.731	-7.123
Country	FI	DK	FI	HU
MAX	140.167	15.906	177.607	32.291
Country	PL	MT	PL	HR

3.2. Business enterprise sector

Regarding GERD by sector of performance in business enterprise

sector in Romania we obtained for the average indicators of time series the results in Table 5.

Table 5 Average indicators of time series for business enterprise sector in Romania

the mean	507.218
the average absolute change	71.078
the average of dynamic indices	1.189
the average rhythm of changing	18.876

In Romania the annual mean of GERD in business enterprise sector is 507.218 million euro per year. From one year to another we have on average an increase of 71.078 million euro. This increase represents 18.876% or an increase by a factor of 1.189.

We made also here a graphical comparison between the data from Romania between 2013 and 2022 and the composite average at the level of EU-27, as we can see in Figure 2.

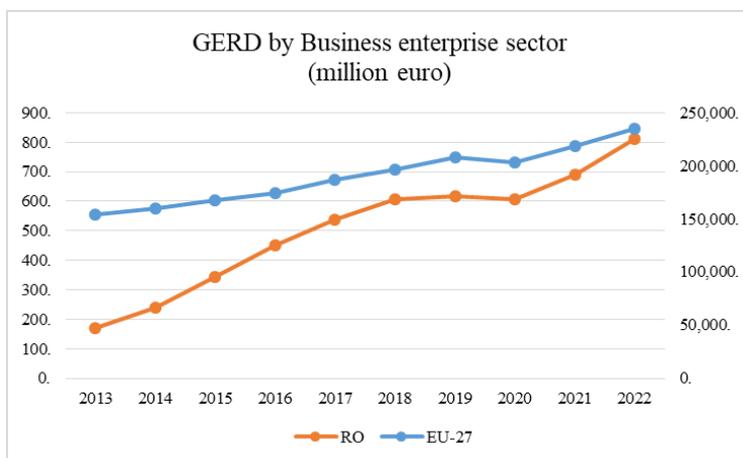


Fig. 2 The evolution of GERD in business enterprise sector in Romania and EU-27

In Table 6 to Table 8 we have calculated the dynamic rhythms with fixed base and with chain base. We can observe that in Romania in 2015 compared to 2013 we have an increase with 101.238% of the GERD. This increase was the maximum value between all the EU-27 countries. Also in 2015 compared to 2014 we have a maximum increase of 44.350%. The

same for 2016 compared to 2013 – 164.21% increase, and for 2017 compared to 2013, an increase of 213.380%, and for 2018 compared to 2013, an increase of 255.598%.

Table 6 Dynamic rhythms with fixed base and with chain base (a)

R	2014/ 2013	2015/ 2013	2015/ 2014	2016/ 2013	2016/ 2015	2017/ 2013	2017/ 2016
MIN	-19.776	-12.061	-34.948	-31.602	-28.191	-16.150	-3.831
Country	EE	FI	LV	LV	LV	SI	DK
MAX	46.422	101.238	44.350	164.121	87.832	213.380	38.889
Country	LV	RO	RO	RO	CY	RO	LV

Table 7 Dynamic rhythms with fixed base and with chain base (b)

R	2018/ 2013	2018/ 2017	2019/ 2013	2019/ 2018	2020/ 2013	2020/ 2019
MIN	-8.159	-6.692	-4.226	0.674	0.910	-11.966
Country	FI	LU	FI	DK	FI	LU
MAX	255.598	31.664	315.684	55.967	381.633	50.721
Country	RO	CY	CY	EE	CY	LV

Table 8 Dynamic rhythms with fixed base and with chain base (c)

R	2021/ 2013	2021/ 2020	2022/ 2013	2022/ 2021
MIN	11.958	1.149	17.263	-11.521
Country	FI	IT	FI	HU
MAX	394.982	20.004	411.825	54.322
Country	CY	LV	CY	HR

3.3. Government sector

the average indicators of time series
the results in Table 9.

Regarding GERD by sector of
performance in business enterprise
sector in Romania we obtained for

Table 9 Average indicators of time series for government sector in Romania

the mean	308.663
the average absolute change	9.943
the average of dynamic indices	1.032
the average rhythm of changing	3.184

In Romania the annual mean
of GERD in government sector is
308.663 million euro per year. From
one year to another we have on
average an increase of 9.943 million
euro. This increase represents
3.184% or an increase by a factor of
1.032.

data from Romania between 2013
and 2022 and the composite average
at the level of EU-27, as we can see
in Figure 3.

We made also here a
graphical comparison between the

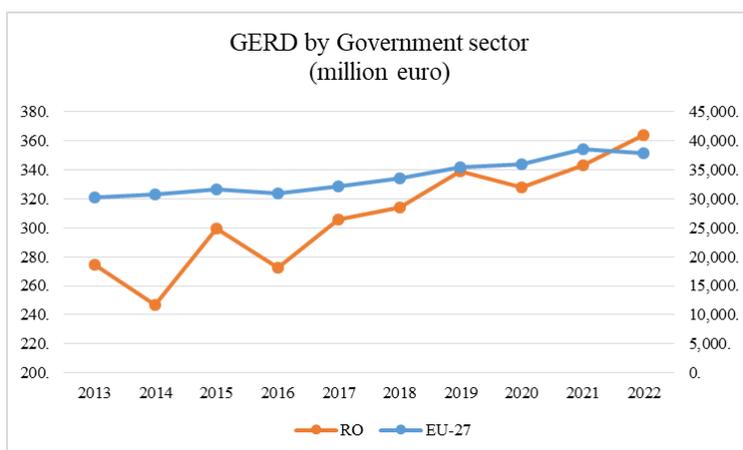


Fig. 3 The evolution of GERD in government sector in Romania and EU-27

In Table 10 to Table 12 we have calculated the dynamic rhythms with fixed base and with chain base. This time Romania is not among the countries with minimum or maximum values among all EU-27 countries, but we can provide some intermediate values. For example in 2014 compared to 2013 we had in Romania a maximum decrease of -10.028, followed by a decrease of -

9.017 in 2016 compared to 2015. Talking about increases, we had in Romania the maximum one in 2022 compared to 2013 (32.591%), and the next value of 24.869% in 2021 compared to 2013.

Table 10 Dynamic rhythms with fixed base and with chain base (a)

R	2014/ 2013	2015/ 2013	2015/ 2014	2016/ 2013	2016/ 2015	2017/ 2013	2017/ 2016
MIN	-10.992	-16.801	-11.881	-88.788	-93.519	-89.215	-20.654
Country	SI	FI	FI	PL	MT	PL	MT
MAX	51.662	109.719	95.349	85.846	64.126	89.841	36.781
Country	SK	MT	MT	AT	AT	AT	DK

Table 11 Dynamic rhythms with fixed base and with chain base (b)

R	2018/ 2013	2018/ 2017	2019/ 2013	2019/ 2018	2020/ 2013	2020/ 2019
MIN	-87.310	-10.386	-90.303	-23.586	-86.585	-9.765
Country	PL	LT	PL	PL	MT	LT
MAX	100.304	42.010	114.951	36.413	116.732	60.895
Country	AT	MT	AT	BG	AT	PL

Table 12 Dynamic rhythms with fixed base and with chain base (c)

R	2021/ 2013	2021/ 2020	2022/ 2013	2022/ 2021
MIN	-81.698	0.408	-80.008	-12.314
Country	PL	LU	PL	DE
MAX	134.701	100.000	154.000	26.851
Country	AT	MT	AT	EE

3.4. Higher education sector

Regarding GERD by sector of performance in business enterprise sector in Romania we obtained for the average indicators of time series the results in Table 13.

Table 13 Average indicators of time series for higher education sector in Romania

the mean	105.603
the average absolute change	1.668
the average of dynamic indices	1.014
the average rhythm of changing	1.432

In Romania the annual mean of GERD in higher education sector is 105.603 million euro per year. From one year to another we have on average an increase of 1.668 million euro. This increase represents 1.432% or an increase by a factor of 1.014, the lowest values until now, compared to the other sectors.

We made also here a graphical comparison between the data from Romania between 2013 and 2022 and the composite average at the level of EU-27, as we can see in Figure 4.

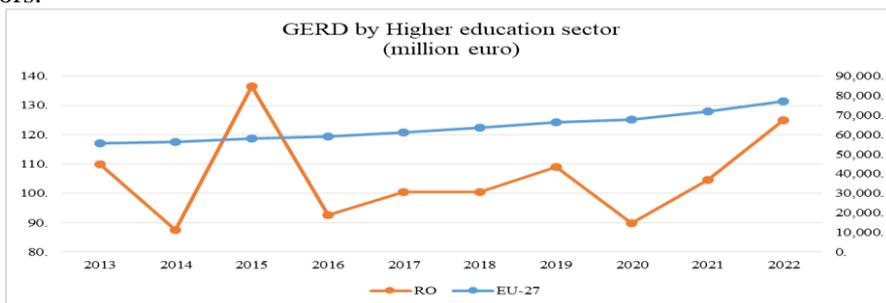


Fig. 4 The evolution of GERD in higher education sector in Romania and EU-27

In Table 14 to Table 16 we have calculated the dynamic rhythms with fixed base and with chain base. This time Romania is among the countries with

minimum values among all EU-27 countries. In 2014 compared to 2013 in Romania we had a decrease of -20.405%, in 2020 compared to 2013 a decrease of -18.280, in 2020 compared to 2019 a decrease of -17.505, and in 2021 compared to 2013 a decrease of -4.817%.

Table 14 Dynamic rhythms with fixed base and with chain base (a)

R	2014/ 2013	2015/ 2013	2015/ 2014	2016/ 2013	2016/ 2015	2017/ 2013	2017/ 2016
MIN	-20.405	-10.775	-21.675	-30.362	-56.262	-26.519	-5.459
Country	RO	SI	BG	EE	SK	LT	HR
MAX	29.788	100.807	76.201	51.817	44.387	58.054	45.445
Country	BG	SK	SK	HR	HR	PL	HU

Table 15 Dynamic rhythms with fixed base and with chain base (b)

R	2018/ 2013	2018/ 2017	2019/ 2013	2019/ 2018	2020/ 2013	2020/ 2019
MIN	-15.778	-15.535	-3.275	-3.384	-18.280	-17.505
Country	LT	IE	SK	SE	RO	RO
MAX	89.553	51.398	149.469	62.363	153.506	18.854
Country	PL	LV	PL	BG	PL	LT

Table 16 Dynamic rhythms with fixed base and with chain base (c)

R	2021/ 2013	2021/ 2020	2022/ 2013	2022/ 2021
MIN	-4.817	0.324	7.539	-0.501
Country	RO	EL	IT	SE
MAX	184.509	22.466	209.132	23.209
Country	PL	HU	HR	LV

3.5.Private non-profit sector

Regarding GERD by sector of performance in private non-profit sector in Romania we obtained for the average indicators of time series the results in Table 17.

Table 17 Average indicators of time series for private non-profit sector in Romania

the mean	2.690
the average absolute change	0.204
the average of dynamic indices	1.070
the average rhythm of changing	6.974

In Romania the annual mean of GERD in private non-profit sector is only 2690 million euro per year. From one year to another we have on average an increase of 0.204 million euro. This

increase represents 6.974% or an increase by a factor of 1.070.

We made also here a graphical comparison between the data from

Romania between 2013 and 2022 and the composite average at the level of EU-27, as we can see in Figure 5.

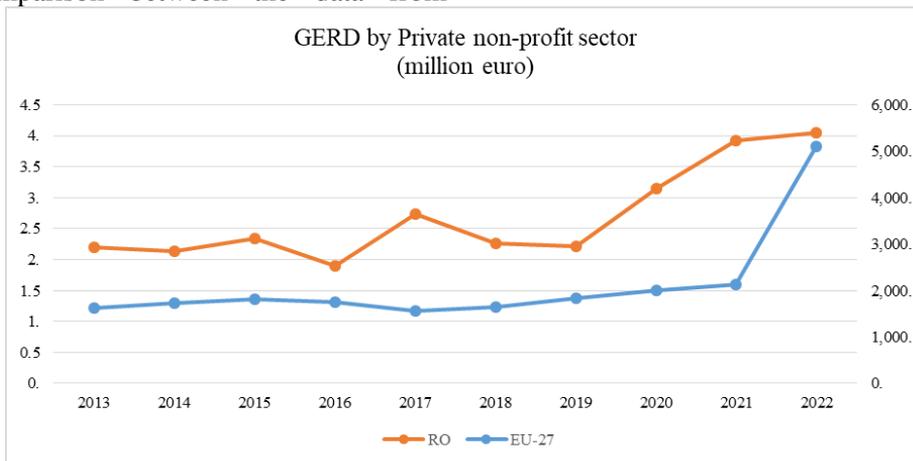


Fig. 5 The evolution of GERD in private non-profit sector in Romania and EU-27

In Table 18 to Table 20 we have calculated the dynamic rhythms with fixed base and with chain base. In 2014 compared to 2013 in Romania we had a decrease of -3.176%. Also, from other calculations in 2016 compared to 2015 we had a decrease

of -18.777, and in 2018 compared to 2017 a decrease of -17.228. We had an increase in 2021 compared to 2013 of 77.904% and in 2022 compared to 2013 an increase of 83.439%.

Table 18 Dynamic rhythms with fixed base and with chain base (a)

R	2014/ 2013	2015/ 2013	2015/ 2014	2016/ 2013	2016/ 2015	2017/ 2013	2017/ 2016
MIN	-3.176	-32.799	-41.558	-46.257	-52.751	-40.672	-34.599
Country	RO	PL	PL	SI	BG	SE	SE
MAX	195.879	298.373	58.879	237.961	167.074	367.380	769.652
Country	SK	SK	EE	SK	PL	SI	SI

Table 19 Dynamic rhythms with fixed base and with chain base (b)

R	2018/ 2013	2018/ 2017	2019/ 2013	2019/ 2018	2020/ 2013	2020/ 2019
MIN	-45.483	-25.076	-74.946	-92.747	-77.223	-26.785
Country	SE	BG	SK	SK	SK	EL
MAX	697.059	70.538	1522.727	103.589	1794.385	49.905
Country	SI	SI	SI	SI	SI	EE

Table 20 Dynamic rhythms with fixed base and with chain base (c)

R	2021/ 2013	2021/ 2020	2022/ 2013	2022/ 2021
MIN	-54.989	-14.346	-54.230	-37.161
Country	SK	EE	SK	EE
MAX	2374.599	97.619	3101.070	50.032
Country	SI	SK	SI	CZ

4. CONCLUSIONS

The Gross domestic expenditure on R&D (GERD) is detailed on four sectors of activity. For business enterprise sector the amount is 54.883%. For government sector the percentage is 33.399%. For the higher education sector the value is 11.427%, and for the private non-profit sector the percentage is 0.291%.

From 2013 to 2022 the evolution of GERD in all of those sectors represented an increase. We consider that Romania needs more investments in higher education sector.

REFERENCES

- [1]<https://ec.europa.eu/eurostat/data/database>, last retrieved 15 March 2024.
 [2]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdtot/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.
 [3]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdsc/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

[4]https://ec.europa.eu/eurostat/databrowser/view/rd_e_fundgerd/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

[5]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdfund/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

[6]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdcost/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

[7]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdact/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

[8]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdsobj07/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

[9]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdreg/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

[10]https://ec.europa.eu/eurostat/databrowser/view/rd_e_gerdins/default/table?lang=en&category=scitech.rd.rd_e, last retrieved 15 March 2024.

**REGIONAL DEPARTMENT OF
DEFENSE RESOURCES MANAGEMENT STUDIES**

160, Mihai Viteazul St., 500183, Brasov, Romania

www.jodrm.eu

e-mail: journal@crmra.ro

journal.dresmara@mapn.ro

ISSN: 2068 - 9403

eISSN: 2247 - 6466