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"HUMAN RESOURCES" AS A COMPETITIVE ADVANTAGE: HYPOTHESIS OF REORGANIZATION, PROCESSES, AND FUNCTIONING OF DEFENSE 4.0

ABSTRACT

The transition to Defense 4.0 requires a profound overhaul of human capital management. The paper analyzes how human resources can and must continue to represent a strategic competitive advantage, integrating hard and soft skills with technologies such as AI, e-learning, and SNA/ONA. The analysis is supported by institutional references and concrete operational cases such as Army 4.0, IFTS, and Multi-Capability Carrier. Adaptive HR models are proposed, with a focus on continuous training and distributed leadership.

The transition to Defense 4.0 requires a deep revision of human capital management. This paper explores how human resource can and must continue to act as a strategic competitive advantage by integrating hard and soft skills with technologies such as AI, e-learning and SNA/ONA. The analysis is supported by institutional references and real cases like Army 4.0, IFTS and Multi Capability Carrier. Adaptive HR models are proposed, focusing on continuous training and distributed leadership.

Keywords: Defense 4.0; Human Capital; Social Network Analysis (SNA); Strategic Human Resources Management; Organizational Innovation

1. Introduction

The acceleration of economic, technological, and strategic transformations in recent years has generated an operating environment characterized by increasing complexity, multidimensionality, and uncertainty. In this scenario, innovations related to the so-called Industry 4.0—such as artificial intelligence, *Internet of Things*, *ibig data*, advanced robotics, and immersive technologies – have not only redefined industrial processes, but are also profoundly transforming the defense sector. This phenomenon has led to the emergence of a new paradigm: **Defense 4.0**, that is, a systemic and interconnected conception of military capabilities, in which technological components integrate with human ones to increase operational effectiveness in multi-domain contexts.

However, while much attention has been paid to the technological aspects of the transformation, **the centrality of human resources** It remains an essential element to ensure resilience, adaptability, and strategic success. Contemporary military operations, in fact, require not only the use of sophisticated tools, but also professionals capable of learning rapidly, collaborating in complex environments, making critical decisions quickly, and leading authoritatively under high-pressure conditions. In this context, human capital is seen not as an accessory factor, but as a true multiplier of strategic effectiveness.

To successfully address the challenges of Industry 4.0, the Armed Forces must profoundly rethink their recruitment, training, deployment, and personnel development models, investing in new skills—both technical and transversal—and flexible and adaptive organizational approaches. This involves not only structural and regulatory updates,

but also a redefinition of leadership, decision-making processes and continuous learning logic.

This contribution is based on an extended elaboration of the Master's thesis written by Antonio Rangoni as part of the II level Master's degree in "Global Strategy and Security", held at the University of Turin and the IASD-Institute for Advanced Defense Studies, during the 75th IASD Study Session (academic year 2023–2024).¹ It aims to offer a structured reflection on these issues, proposing a human-centric interpretation of the transformation of Defense. After defining the strategic role of human resources in modern military operations (section 2), the main implications of Defense 4.0 on human resources management will be analyzed (section 3), with a focus on training, selection, and deployment (section 4). Some emerging innovations will then be introduced, including the potential use of *Social Network Analysis* (SNA) and of the *Organizational Network Analysis* (ONA) to support distributed leadership and skills management (section 5). Finally, the paper will propose strategic and operational recommendations aimed at integrating the human dimension and technological innovation in a synergistic and sustainable way (section 6), concluding with a summary of the main findings (section 7).

2. Human Capital in Defense: The True Competitive Advantage

In the framework of the digital transformation of Defence, the **human capital** represents an essential strategic element, the enhancement of which directly impacts the operational readiness and competitive superiority of the Armed Forces. In a constantly evolving multi-domain environment, characterized by uncertainty, asymmetries, and hybrid threats, the ability to deploy motivated, competent, and adaptable personnel is as critical a resource as the most advanced technologies.²

2.1. Definition and strategic relevance

Human resources, in the military context, must be understood not only as "available personnel", but as a **strategic asset** highly cognitive, relational, and decision-making-intensive. The professionalism of Armed Forces personnel is not limited to the technical execution of operational tasks, but includes the management of complex situations, coordination in joint and international environments, and the ability to make critical decisions under pressure.³

In the Defense 4.0 paradigm, human capital takes on a role **enabling and multiplying** with respect to the use of emerging technologies. The quality of people determines the effectiveness with which tools like AI, autonomous systems, or intelligent grids are integrated into decision-making and operational processes.⁴

2.2. Required skills: hard skills and soft skills

The ongoing transformation involves a reorganization of the skill portfolio required of military personnel. Specifically:

- The **technological hard skills** become central to addressing high-density digital scenarios: skills in *cybersecurity*, management of autonomous systems, *space operations*, *data analysis* and robotics are now considered fundamental in advanced operational profiles;
- At the same time, the following are becoming increasingly important: **soft skills transversal**, essential for operating effectively in distributed and multidisciplinary teams:
 - or Critical thinking and *problem solving* to deal with dynamic contexts;
 - Cognitive flexibility and adaptability to respond to non-standardized tasks;

¹ RANGONI A., *Human resources as a competitive advantage. Hypotheses for reorganization, processes and How Defense 4.0 works* Master's Thesis, Center for Advanced Defense Studies, Rome 2024.

² GENERAL DEFENSE STAFF, *Strategic Concept of the Chief of Defence Staff – Edition 2022*, Rome 2022.

(https://www.difesa.it/assets/allegati/28000/concetto_strategico_del_casmd_2022.pdf)

³ MINISTRY OF DEFENSE, *Multi-Year Defense Programming Document for the three-year period 2022–2024*, Rome 2022.

(https://www.difesa.it/assets/allegati/30714/dpp_2022_2024.pdf)

⁴ LEONARDO SpA, *International Flight Training School (IFTS): Virtual training and simulation for next-generation pilots*, Rome 2021. (<https://www.leonardo.com/it/focus-detail/-/detail/virtual-training-simulation>)

- or Collaborative leadership to effectively lead networks of people, often in fluid and temporary roles;
- or Operational empathy, understood as the ability to understand and coordinate different needs and perspectives;
- or Cultural intelligence, essential for operating in an increasingly integrated future inter-force scenario.

These skills fit into a framework consistent with the **European Qualifications Framework (EQF)**, which defines cross-cutting levels of knowledge, skills and responsibilities to facilitate transparency, transferability and lifelong learning in civilian and military contexts⁵. As highlighted by Hoffmann et al. (2010)⁶, The challenge for complex organizations will be to translate operational needs into measurable, modular, and transferable skill architectures, adapted to emerging technologies and highly complex environments. These skills are not innate, but must be built, monitored, and updated through ongoing training and management models focused on developing potential.⁷

2.3. Human capital vs. technology: a false dichotomy

One of the most common mistakes in organizational transformation processes is to conceive the relationship between technology and people in opposing terms. In the case of Defense, this dichotomy is particularly dangerous: as highlighted by Kotter (2012)⁸, no transformation can be successful without the active, conscious and motivated involvement of the people who are part of it.

Technology, no matter how advanced, cannot replace human cognitive, decision-making, and ethical skills. Instead, it requires human capital capable of actively interacting with it, developing **new synergies** and adaptive operating models.

2.4. Sustainable competitive advantage

Competitive advantage in the military field is no longer measured only in terms of numerical or technological superiority, but also and above all in terms of adaptive and relational superiority. From this perspective, human capital represents a sustainable competitive advantage⁹, as:

- not easily replicable by competitors;
- capable of learning, innovating and disseminating knowledge;
- able to react intelligently and cohesively in the face of unexpected scenarios.

Investing in people means building resilience, strategic agility and the ability to deal with the unexpected – key characteristics for the success of the armed forces of the future.¹⁰

3. Defense 4.0 and the evolution of needs *HR*

The emergence of the Defense 4.0 paradigm represents a structured response to the changing operational and technological context in which the Armed Forces are called to operate. Inspired by the principles of Industry 4.0, the ongoing transformation aims to create a more interconnected, digitalized and adaptive military ecosystem, where the synergistic combination of advanced platforms, intelligent sensors, data networks and artificial intelligence amplifies the effectiveness of human capital¹¹.

3.1. Origins and characteristics of Defense 4.0

Defense 4.0 is the integrated evolution of a multitude of interconnected dynamics. It arises, on the one hand, from technological advancements in digitally intensive sectors; on the other, from the increased operational complexity of missions, increasingly conducted in joint, multinational, and multi-domain contexts. Added to this is

⁵ COUNCIL OF THE EUROPEAN UNION, *Recommendation on the European Qualifications Framework for lifelong learning (EQF)*, CELEX: 32017H0615(01), Brussels 2017.

⁶ HOFFMANN MHW - HAMPE M. - MÜLLER G. - BARGSTÄDT HJ - HEIß HU - SCHMITT H., *Knowledge, Skill, and Competences – The Future of Global Learning Engineering Education*, Madrid 2010. ULRICH D., *Human*

⁷ *Resource Champions: The Next Agenda for Adding Value and Delivering Results*, Boston 1997. KOTTER JP, *Leading Change*, Boston 2012.

⁹ BARNEY J., *Firm resources and sustained competitive advantage*, in 'Journal of Management' 17 (1991), pp. 99–

¹⁰ 120. MINISTRY OF DEFENSE, *Multi-Year Programmatic Document...*, op.cit.

¹¹ GENERAL DEFENSE STAFF, *Chief of Defence Staff's Strategic Concept – 2022 Edition*, Rome 2022. (https://www.difesa.it/assets/allegati/28000/concetto_strategico_del_casmd_2022.pdf)

the urgency of ensuring real-time information superiority, rapid decision-making, and interoperability between systems, platforms, and human resources.

According to the Strategic Concept of Defense¹² This transformation isn't limited to the modernization of platforms or weapons, but involves the entire architecture of the Defense system: from organizational culture to training models, to personnel management dynamics. In this sense, Defense 4.0 isn't simply a technological leap, but a systemic transformation that profoundly redefines the very way we operate, learn, and command.

3.2. Evolution of processes^{HR}

In parallel with technological innovation, the structures^{HR} of the Armed Forces must face a profound transformation of role and approach. Traditional models, focused on linearity and stable career paths, are no longer adequate. New operational needs require processes^{HR} more dynamic, flexible and personalized.

Targeted and flexible recruitment

Access to highly specialized profiles – in the field^{cyber}, AI, data analytics, space – requires new ways of **competitive recruitment**, also in collaboration with universities, industries and technological hubs¹³ It is necessary to attract candidates capable of combining technical skills with behavioral attitudes compatible with the military operational environment.

Continuous, digital and adaptive training

As underlined in the “Army 4.0” model and in the programs of the **International Flight Training School (IFTS)**, training can no longer be considered a one-off phase, but must become a continuous, personalized process supported by immersive technologies¹⁴ E-learning, VR/AR simulations, and training in hybrid digital environments promote greater training effectiveness while reducing costs and risks.

Modern leadership and multi-domain context

The commander of Defense 4.0 is no longer just a technical decision maker, but a **complex systems orchestrator**, called upon to coordinate heterogeneous resources, manage multi-domain interactions, and make rapid decisions in dynamic contexts. New challenges require a **leadership collaborative and adaptive**, capable of promoting inter-force and inter-agency integration, and of valorizing multidisciplinary teams. As underlined by Uhl-Bien et al. (2007)¹⁵, leadership in complex organizations must evolve towards **distributed and network models**, where trust, operational delegation, and speed of interaction become fundamental elements to ensure effectiveness and resilience.

4. Advanced personnel management models: training, selection, employment

The transformation of Defense in a 4.0 perspective requires a systemic renewal of military personnel management, which can no longer be addressed with static and linear models. Adaptive approaches must be adopted. Capable of responding rapidly to changing operational needs and leveraging individual potential over time. In this context, human capital must be considered not just as a resource to be employed, but as a dynamic system to be cultivated, updated, and strategically directed.

4.1. Process adaptation needs^{HR}

Traditional management models, centered on rigid career paths and seniority-based promotions, appear inadequate to address today's complexity. Staff must be able to be selected, assigned, and trained based on competency, potential, and

¹² GENERAL DEFENSE STAFF, *Chief of Defence Staff's Strategic Concept – 2022 Edition*, Rome 2022.

(https://www.difesa.it/assets/allegati/28000/concetto_strategico_del_casmd_2022.pdf)

¹³ MINISTRY OF DEFENSE, *Multi-Year Programmatic Document...*, op.cit. LEONARDO SpA,

¹⁴ *International Flight Training School (IFTS)...*, op.cit

¹⁵ UHL-BIEN M. - MARION R. - MCKELVEY B., *Complexity Leadership Theory: Shifting leadership from the industrial age to the knowledge era*, in 'The Leadership Quarterly' 18 (2007), pp. 298–318.

Adaptability, rather than mere formal affiliation to a department or rank. A more agile, modular, and meritocratic organizational model is needed.¹⁶

4.2. Continuous, digital, and immersive training

Training plays a central role as a tool for **building sustainable competitive advantage**. The transition from a “one-off” logic to a lifelong learning logic (*lifelong learning*) is essential today. In particular, training methods based on:

- **e-learning modular**: allows you to update theoretical knowledge with flexibility, reducing operational downtime;
- **immersive simulation (VR/AR)**: enables real-time training in digital environments, with the ability to safely replicate complex operational scenarios;
- **trainer and gamification procedures**: improve engagement, memorization and management of operational errors, promoting experiential learning¹⁷.

These solutions are effective not only for high-tech operators, but also for transversal functions, such as logistics, cyber, control, and command. International literature has highlighted that simulated training contributes to cost reduction, reduced exposure to operational risks, and increased efficiency. *retention* of skills in the long term¹⁸.

4.3. Leadership, well-being and motivation

In the Industry 4.0 context, leadership isn't exercised solely through formal command, but requires the ability to inspire, motivate, and build operational cohesion. Leaders must be able to leverage the diversity of profiles and specializations, foster psychologically safe environments, and facilitate the professional growth of their employees. As highlighted by Edmondson¹⁹ A climate of trust and openness fosters learning, information sharing, and innovation within teams, even in high-pressure environments like the military. Organizational well-being multiplies effectiveness: environments where military personnel feel involved, listened to, and respected foster better performance, greater willingness to take controlled risks, and higher institutional loyalty.

4.4. Cases of concrete application

The thesis behind this paper²⁰ He collected testimonies and documentation relating to cases of excellence already active in Italy, which demonstrate the effectiveness of the renewal of personnel management models in the Defense sector:

Army 4.0

Project that foresees the integration of new technologies (AI, simulation, distributed sensors) in the training and operational paths of the Italian Army, with attention to *reskilling* continuous staff²¹.

Multi-Capability Carrier-Navy

A platform that combines advanced technologies and new operational doctrine. The crew is trained through simulated environments and distributed training, with a strong focus on joint force synergy and the human factor.²²

¹⁶ MINISTRY OF DEFENSE, *Multi-Year Programmatic Document...*, *op.cit.*

¹⁷ LEONARDO SpA, *International Flight Training School (IFTS)...*, *op.cit.*

¹⁸ Salas, E., Wildman, J. L., & Piccolo, R. F. (2009). Using simulation-based training to enhance management education. *Academy of Management Learning & Education*, 8(4), 559–573.

¹⁹ Edmondson, A. (1999). Psychological safety and learning behavior in work teams. *Administrative Science Quarterly*, 44(2), 350–383.

²⁰ RANGONI A., *Human resources as a competitive advantage. Hypotheses for the reorganization, processes, and operation of Defense 4.0*. Master's Thesis, Center for Advanced Defense Studies, Rome 2024

²¹ ARMY GENERAL STAFF, *Army 4.0: Preparing for the challenges of the future*, Rome 2022. (<https://www.esercito.difesa.it/comunicazione/Pagine/Esercito-4-0-prepararsi-alle-sfide-del-futuro-220914.aspx>)

²² NAVY – UPICOM, *Italian Navy Report 2023*, Rome 2023.

International Flight Training School (IFTS)

The result of the collaboration between the Italian Air Force and Leonardo, the IFTS represents an advanced training model for military pilots, with latest generation simulation systems integrated into a logic *blended*²³.

5. Emerging innovations in human resources management

The Defense 4.0 paradigm, in addition to transforming the tools and operational doctrines, also opens up new possibilities for the **strategic human resources management**. The combination of data, predictive models, and advanced analytical tools allows us to move beyond the reactive approach to personnel management, introducing more anticipatory, adaptive, and network-oriented approaches. From this perspective, tools such as Artificial Intelligence, the *Social Network Analysis (SNA)* and the *Organizational Network Analysis (ONA)* can offer valuable support to military leadership and offices *HR* to optimize the use of human capital.

5.1. Artificial Intelligence in processes *HR*

AI applied to human resources management enables critical challenges to be addressed more efficiently. Potential operational applications already tested or under evaluation include:

- **predictive recruiting and selection** Artificial intelligence can support the identification of the most suitable candidates through the analysis of profiles, experiences and aptitudes, improving the efficiency and consistency of the selection process²⁴;
- **customization of training courses**: by analyzing past performance and future needs, AI can suggest customized training modules, improving effectiveness and engagement;
- **predictive performance analysis** By integrating operational and behavioral data, you can predict the potential for success in specific roles, facilitating assignment decisions.

The use of AI in the public and military sectors will still have to respect criteria of transparency, reliability and human oversight, in line with the European Commission's recommendations on the AI Act.²⁵

5.2. SNA and ONA: towards a network-oriented HR management

In parallel, innovative methodologies are gaining ground, such as *Social Network Analysis (SNA)* and the *Organizational Network Analysis*. These tools, originally developed in academia and business, are increasingly finding application in the public and security sectors. SNA allows you to map and analyze relationships between individuals or units within an organizational network. ONA, more operational structure-oriented extension, allows for the identification of information flows, collaboration, informal leadership and critical nodes²⁶. In the military context, possible applications include:

- **identification of high centrality nodes** (key individuals for the coordination or transmission of knowledge);
- **distributed leadership mapping**, often not visible in the formal structure;
- **identifying communication bottlenecks or isolated teams**, useful for internal reorganizations or interoperability optimization;
- **resource allocation support**, based on real interactions and not just formal roles. The integration of these analyses into processes *HR* can improve organizational resilience, facilitate rapid adaptation to changing contexts and support the construction of distributed competence networks²⁷.

²³ LEONARDO SpA, *International Flight Training School (IFTS)...*, op.cit

²⁴ TAMBE P. - CAPPELLI P. - YAKUBOVICH V., *Artificial Intelligence in Human Resources Management: Challenges and a Path Forward*, in 'ILR Review' 72 (2019), pp. 595-619.

²⁵ EUROPEAN COMMISSION, *Artificial Intelligence Act: Proposal for a Regulation laying down harmonized rules on artificial intelligence*, Brussels 2023.

²⁶ CROSS R. - PARKER A., *The Hidden Power of Social Networks: Understanding How Work Really Gets Done in Organizations*, Boston 2004.

²⁷ BARABÁSI A.-L., *Linked: The New Science of Networks*, Cambridge (MA) 2002.

5.3. Towards data-informed leadership

The increasing availability of internal data, integrated with advanced analytical tools, allows us to evolve from an administration-centric human resources management model towards a performance-oriented approach. **strategic leadership support.** From this perspective, the data *HR* They play a key role in commanders' decisions, becoming a useful information asset for guiding operational choices, career paths, and functional assignments. Predictive models, fueled by structured data and field observations, can support the **adaptive staff allocation**, improving the match between individual skills and organizational needs. Furthermore, continuous monitoring of informal networks and actual relational flows allows us to detect dynamics of cohesion, isolation, or redundancy within operational teams, strengthening leadership's ability to intervene in a targeted and timely manner.

The combination of artificial intelligence, tools *network analysis* (SNA/ONA) and a solid culture of continuous training represents the next evolutionary stage of the function *HR* in Defense 4.0, provided that it is accompanied by a responsible governance framework and the diffusion of analytical skills within the organization.

6. Strategic recommendations

In light of the analysis conducted in the previous paragraphs, it is clear that the success of the transition to Defense 4.0 depends not only on the adoption of new technologies, but also on the ability to profoundly rethink human capital management from a strategic perspective. Human resources represent the true multiplier of effectiveness in modern operational contexts, provided they are adequately trained, valued, and integrated into an adaptive organizational system.

Below are some operational recommendations, divided by areas of intervention, aimed at supporting leadership and structures *HR* of Defense in the ongoing transformation.

6.1. Training and continuous updating

The transformation in the 4.0 key requires a profound evolution of training models, which must become **flexible, modular and digital**, integrating tools such as *the e-learning*, virtual reality, and immersive training. These approaches must be calibrated according to different roles and levels of responsibility to ensure effective and personalized learning. Alongside technical training, it is essential **promote the development of soft skills**, so as to prepare personnel to operate in complex, uncertain and multinational environments. To support this continuous evolution, it is necessary **build structured programs of reskilling and upskilling**, in close collaboration with universities, research centers, and industrial partners, to ensure constant alignment between organizational needs and available skills.

6.2. Adaptive leadership and strategic management of potential

In the contemporary operational context, it is essential **promote collaborative and distributed leadership**, based on mutual trust, decision-making autonomy, and the ability to activate networks of expertise within and outside formal hierarchical structures. To be effective, leaders must be **trained in reading and interpreting organizational data**, so as to precisely understand communication flows, motivational dynamics and team performance.

At the same time, it goes **the motivational dimension and organizational well-being are enhanced**, recognizing them as strategic factors of internal cohesion and operational readiness, capable of strengthening collective effectiveness and reducing the risks of latent dysfunctions in high-pressure contexts.

6.3. Cross-sector collaborations and innovation *HR*

To accelerate the transformation of the function *HR* in Defense, it is essential **strengthen synergies between military institutions, industry and academia**. These collaborations must not be limited to the development of technologies, but extend to the co-design of models

innovative training and personnel management systems capable of responding to emerging operational challenges.

In parallel, they should be **large-scale trials have begun** that employ tools such as the *Social Network Analysis* (SNA), the *Organizational Network Analysis* (ONA) and artificial intelligence applied to the field *HR*. Such tools should be tested in controlled pilot contexts to assess their actual impact on decision-making effectiveness, talent allocation, and organizational resilience.

Finally, it is appropriate to promote the creation of centers of excellence *HR* within the Ministry of Defense, with specific skills in data analysis, organizational innovation, and methodological support for operational units. In this context, the **Center for Advanced Defense Studies (CASD)** can and must play a strategic role in Defense 4.0 training. The recent Ministry of Defense Decree of September 11, 2024²⁸ formally recognized its function as **Higher education and research university school with a special system**, strengthening its centrality in the advanced military training system. In line with this evolution, the CASD can consolidate itself as **strategic thinking hub** national, contributing to the preparation of competent, adaptive leadership capable of operating in multi-domain contexts.

The real challenge of Defense 4.0 does not consist in the passive adoption of technologies, but in **building a new human-centric operating model**, in which:

- technology enables, but **it is people who give meaning and direction**;
- data drives, but **it is the leaders who decide**;
- skills evolve, but **only with an organizational culture capable of learning and adapting**.

7. Conclusion

The transition to the **Defense 4.0** represents an epochal challenge for the Armed Forces, which goes far beyond the adoption of new technologies. It requires a profound cultural, organizational, and strategic rethinking, in which the **human resource** returns to occupy a central position, not as a simple supporting element, but as **main driver of change**. In a context characterized by pervasive digitalization, automation and the increasing integration of operational domains – sky, land, sea, space, *cyber*, *underwater* and information – it is clear that the real competitive advantage will not only reside in autonomous systems or predictive algorithms, but in people: **women and men able to learn quickly, make decisions in complex situations, collaborate in networks and lead transformation**.

To effectively address current and future challenges, it is necessary to equip ourselves with **advanced human resources management models**, based on data, networks, distributed leadership, and organizational well-being. Continuous training plays a crucial role and must be designed in a flexible, digital, and multi-domain manner, with an increasing focus on developing transversal skills, such as critical thinking, interpersonal skills, and intercultural empathy.

Within the personnel life cycle—from selection to deployment, evaluation, and reassignment—training is the cornerstone around which military personnel preparation revolves. In this context, the **Center for Advanced Defense Studies** can aspire to the role of a hub for strategic thinking and educational innovation, also through the definition of common standards and the use of advanced technologies such as simulation and predictive analysis. Innovative tools such as **Artificial intelligence**, the *Social Network Analysis* (SNA) and the *Organizational Network Analysis* (ONA) offer further opportunities to analyze, enhance, and strategically direct human potential. However, the adoption of these tools must be accompanied by careful ethical oversight, algorithmic transparency, and the guarantee of fairness and inclusiveness in decision-making processes.

²⁸ Ministry of Defense. (2024). *Decree of 11 September 2024 – Establishment of the Centre for Advanced Defence Studies as a special-organisation university higher education institution* Official Journal of the Italian Republic, General Series No. 213. Retrieved from <https://www.gazzettaufficiale.it/eli/id/2024/09/11/24A04629/SG> (accessed May 18, 2025).

In light of these considerations, it appears clear that the reduction in staffing provided for by law no. 244/2012 ("Di Paola law")²⁹ is no longer relevant and must be overcome. **Freedom has a cost**, and this cost must be met with resources, vision, and institutional courage. Finally, a systemic openness to academia and industry is desirable, promoting collaborations, temporary exchanges of expertise, and shared human capital development paths. This approach can not only enrich the Armed Forces' skill set, but also strengthen their ability to operate in complex and highly specialized international environments.

Investing in people, nurturing their talent, and ensuring their well-being is the key to a modern, effective, and truly "people-centric" Defense System. Only in this way can Defense 4.0 be fully realized, becoming not only more technological, but also more human, cohesive, and resilient.

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Contribution to the United Nations Sustainable Development Goals (SDGs)

This study contributes to the achievement of the following Sustainable Development Goals:

- SDG 4 – Quality Education;
- SDG 8 – Decent work and economic growth.

²⁹ **ITALIAN REPUBLIC**, Law 31 December 2012, n. 244 – Revision of the national military instrument (so-called "Di Paola Law"), in 'Official Journal of the Italian Republic', General Series no. 3 of 4 January 2013.