# REFORMING THE INNOVATION ECOSYSTEM FOR NATIONAL SECURITY IN THE CONTEXT OF THE USA'S EXERCISE DESH-3 AND THE EVOLUTION OF THE CONFLICT IN UKRAINE: ADAPTATION OF THE GUIPRR MODEL IN THE ACADEMY OF ROMANIAN SCIENTISTS - MILITARY SCIENCES SECTION

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***Abstract:*** *Structural changes in the international security environment, accentuated by the evolution of the war in Ukraine and the strategic competition between great powers, have highlighted the decisive role of technological innovation in the field of national security. Thus, the reform of the innovation ecosystem for national security represents a strategic objective for strengthening the national capacity to respond to contemporary complex threats. Defense Enterprise Science Initiative and The United States' Technology Hub (DESH-3) provides a relevant example of integrating the triad of scientific research, industry and the military into an innovation ecosystem oriented towards operational results.*

*This paper analyzes the implications of these developments for Romania and proposes the adoption of the GUIPRR (Government – University – Industry - Philanthropy Research Roundtable) model, for the ecosystem within the Academy of Scientists of Romania (AOȘR) – Military Sciences Section. This structure is an academic core specialized in military sciences research, and the results of the activities of its members are published in scientific papers and contribute to various interdisciplinary security projects.*

*The research is based on an empirical documentary analysis, specialized literature, case studies and examples of good practices in military innovation, through a mixed methodology. The present study demonstrates that reforming the security innovation ecosystem is a necessary condition for strengthening national resilience and reducing the gap between scientific research and operational application in the security field. The proposed conceptual scheme, adapted to the Romanian context, can increase the efficiency of collaborations and the capacity for innovation in this field.*

***Keywords:*** *national security, innovation ecosystem, DESH-3, War in Ukraine, GUIPRR, AOSR-Military Sciences Section.*

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## 1. Introduction

Innovation has become an essential element of national power in the context of contemporary international security. Romania is in the process of consolidating the innovation ecosystem for security, with an emphasis on scientific research and international cooperation.

Especially under the impetus of the evolution of recent conflicts, characterized by complex hybrid, technological and information threats, strategic innovation capabilities have developed at an accelerated pace, demonstrating that military superiority is no longer defined exclusively by the classical industrial capacity, related to the war industry, but by the speed with which a state can create, test and implement operationally relevant technological solutions. Thus, Ukraine, in about four years of war, has become a major drone production hub, transforming itself into a global UAV superpower, producing millions of devices per year (currently approx. 4 million drones), rapidly innovating and exporting technology with a high success rate, proven in combat (over 70% of interceptions)[1]. This direction, based on an agile adaptation model, also facilitates local production through fundraising platforms (such as UNITED24) and collaboration with private companies, an essential factor for increasing production and repair capacity.

Additionally, the echoes of the recent US Department of Defense exercise DESH-3 reflect a paradigm shift, promoting an integrated model of security-oriented innovation. Through a series of innovative experiments, the US Air Force, together with its coalition partners Canada and the UK, tested and refined the potential of artificial intelligence (AI) to improve decision-making, operational efficiency, and enhance interoperability in the face of complex global security challenges. The event not only demonstrated the potential of AI in supporting military decision-making, but also highlighted the importance of collaboration between the military and private industries to optimize technological developments in military operations and strategic planning. Colonel John Ohlund, director of the Air Force's Advanced Battle Management System Cross-Functional Team (ABMS CFT), said the exercise demonstrated that, under stress conditions, in the absence of familiarity with the scenario and related data, the courses of action proposed by the AI were 97% "tactically viable and valid" compared to 48% of the solutions developed by human specialists[2]. A major

[1] Eduard, S. (2025), *Ukraine produces more drones than all NATO countries combined. "The war forced us to innovate faster"*, Digi24, available at https://www.digi24.ro/-stiri/externe/ucraina-produce-mai-multe-drone-decat-toate-tarile-nato-la-un-loc-razboiul-ne-a-obligat-sa-inovam-mai-repede-3499955, accessed on 16.01.2026.

[2] Freedberg , Jr., S., J. (2026), *Air Force says AI tools outperform Humana planners in ' battle management' experiment*, Breaking Defense, available at https://-breakingdefense.com/2026/01/air-force-says-ai-tools-outperform-human-planners-in-battle-management-experiment/, accessed on 02.02.2026.

conclusion was that innovation is no longer just an aspect limited to the quality of the implemented environments or devices but a complex factor related to the speed of technological transfer and the quality of the decision-making process. Thus, the design and generation of software services within human-machine relationships transcends the sequences of theoretical substantiation, providing assistance without replacing human operators, to produce measurable advantages in the real world. AI is an amplifier of human judgment. Companies participating in DASH-3 retained their intellectual property rights, the military developed a deeper understanding of the functional requirements and integration challenges of future command and control software, all in a balanced manner that encourages innovation without limiting the market.

We can say that, currently, the integration of advanced technologies into organizational structures and their culture represents a rethinking of roles, processes and responsibilities, avoiding blind automation and defensive resistance to technology. Innovation is not only technological. All societal systems that maintain their operability capabilities in the face of hybrid threats, specific to current conflicts environments, highlight that the speed of decision-making is a strategic factor as important as material superiority. In this context, the coordination of algorithmic speed with human judgment generates sustainable operational advantages, through digital innovation.

For Romania, a state located on NATO's Eastern Flank, the conflict in Ukraine amplifies the pressure on national defense and security capabilities. In this context, the paper argues for the need to reform the innovation ecosystem for national security by consolidating the "Triple Helix" development model[3] and adopting the GUIPRR integrative conceptual model, within the Academy of the Romanian Scientists (AOȘR) - Military Sciences Section, the structure that can hold the position of academic actor with a strategic role in this field of sciences.

## 2. Theoretical framework and literature review

The concept of an innovation ecosystem derives from the theory of national innovation systems[4], which emphasizes the interdependence between public institutions, academia and the private sector. Recent literature extends this framework to the field of national security, arguing that effective military innovation requires integrated governance

[3] Leydesdorff , L. & Leydesdorff , H. (1996), *Emergence of a Triple Helix of University-Industry- Government Relations* , Science and Public Policy 23(5), pp. 279-286, https://doi.org/10.1093/spp/23.5.279.

[4] UN, Trade and Development (2023), National innovation system , *Angola Science , Technology and Innovation Policy Review* , UN- iLibrary , pp. 22-50, ISBN (PDF): 9789210019422, DOI: https://doi.org/10.18356/9789210019422c009.

mechanisms and accelerated technology transfer processes[5]. The "Triple Helix" model provides a relevant conceptual basis for the relationships between Universities-Industry-Government. Recent studies suggest that, in the field of security, this model needs to be complemented with new dimensions, such as strategic governance and sustainability strategies[6]. To be successful in the long term, organizations must not only report only on their current performance, in terms of corporate sustainability, but also demonstrate that they align their models and strategies towards sustainability.

Lessons learned from DESH-3 and DESH-2 highlight the importance of institutional fragmentation and aligning scientific research with the real operational needs of the armed forces. Analyses by RAND and CSIS argue that the success of these initiatives depends on the ability to create flexible collaborative networks that favor the reduction of innovation cycles[7,8]. The recent DARPA report[9] draws attention to the significant progress in software technology over the past decade and the wide-ranging implications for secure development processes by commercial vendors, the adoption of secure memory programming languages, and the maturation of formal methods that have enabled verification of critical software components used in commercial products and online services.

The conflict in Ukraine demonstrates the multidimensional nature of contemporary warfare, in which conventional military operations integrate hybrid, cyber and information actions. The excessive use of drones, artificial intelligence and commercial solutions quickly adapted to military needs indicates a structural change in the way innovation in warfare occurs[10].

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[5] Modig , O. & Andersson , K. (2022), *Military Innovation as the Result of Mental Models of Technology* , Scandinavian Journal of Military Studies, 5(1), pp. 45-62, DOI: 10.31374/sjms.117.

[6] Traxler , A., A., Schrack, D. , Greiling , D., Feldbauer , J. & Lautner , M. (2023), *The interplay of sustainability reporting and management control – an exploration of ways for dovetailing to develop reporting beyond accountability* , Journal of Applied Accounting Research 26(6), pp. 160-182, https://doi.org/10.1108/JAAR-08-2022-0222.

[7] Athanasia G. & Cota J. (2022), *Towards the Department of Commerce and Innovation : The 2022-2026 Strategic Plan* , Washington, DC: Center for Strategic & International Studies, available at https://www.csis.org/blogs/perspectives-innovation/towards-department-commerce-and-innovation-2022-2026-strategic-plan, accessed on 17.01.2026.

[8] Kotila , B., Drezner , J., A., Bartels , EB, Hill, D., Hodgson , QE, Huilgol , SS, Manuel, S., Simpson, M. & Wong , JP (2023), *Strengthening the Defense Innovation Ecosystem* , Santa Monica, CA: RAND Corporation, available at https://www.rand.org/pubs/-research_reports/RRA1352-1.html, accessed 01.02.2026

[9] NASEM (2025), *Defense Software for a Contested Future : Agility , Assurance , and Incentives* , Washington, DC: National Academies Press, https://doi.org/10.17226/29129.

[10] Kukkola , J. (2025), *Russia's Adaptation in War against Ukraine (2022-2025)* , National Defense University, Department of Warfare, Helsinki, available at https://www.-doria.fi/handle/10024/193189, accessed on 25.01.2026.

These developments highlight the need to create innovation ecosystems capable of operating under strategic pressure, with reduced reaction times and a high level of adaptability, to unify resources, avoid duplication and fragmentation. In this context, preventing technological surprise for any security and defense system requires frequent reviews and assessments of current military programs, for which an expert structure is needed, capable of evaluating, monitoring and proposing recommendations within a broad framework of scientific research, outside of government efforts.

All these scientific research efforts in the field of innovation should be seen not as a threat to the current research and development programs of military structures, but as a form of collaboration between industry and academia so that they are fully capable of responding quickly to technological surprises, indicating measurable coefficients and comprehensive frameworks for ensuring investments and for the efficient direction of innovation efforts. In essence, what is presented is not a new topic of discussion. For the US Army, the example of the National Academies of Sciences, Engineering, and Medicine (NASEM) is extremely relevant. In this academic structure, committees are created that develop critical reports, which make it possible to consolidate institutional quality standards, with objectivity and responsiveness, based on solid evidence. Thus, the Committee for Preventing Technological Surprise developed a consensual report in which a series of pertinent comments and suggestions were presented, from which a forward-looking conclusion for the future of the army results, namely that a collaboration between science and technology is necessary by streamlining research and innovation for the army's basic technological solutions, simultaneously with those that are fully commercialized and in transition, with the support and experience of a network of external, connected and involved partners [11].

In Romania, such a scientific research structure could be the Academy of Romanian Scientists (AOSR)-Military Sciences Section. AOȘR ranked fourth in the scientific hierarchy of the SCIMAGO rankings in 2025[12]. This ranking certifies the value of scientific results in international rankings. The members of the Military Sciences Section have complex and interdisciplinary areas of scientific competence, mentioned in

[11] NASEM (2025), *Government – University – Industry – Philanthropy Research Roundtable* , National Academies of Sciences , Engineering, and Medicine, USA, available at https://www.nationalacademies.org/units/PGA-GUIRR-24-P-598, accessed on 04.02.2026.

[12] AOSR (2026), *Academy of Scientists of Romania, at the top of the international SCIMAGO rankings* , available at https://www.aosr.ro/academia-oamenilor-de-stiinta-din-romania-in-topul-clasamentelor-internationale-scimago/, accessed on 04.02.2026.

their Curriculum vitae and certified by the results obtained in their professional career [13].

### 3. Research method and hypotheses

To robustly validate of hypotheses and increase the replicability of the research, the study uses a mixed methodology (MMR- Mixed Method Research), based on triangulation. To validate the adaptation of the GUIPRR model in the context of the Romanian security ecosystem, we will apply a sequential exploratory design of theoretical data to the operational realities identified in the case studies (DESH-3 and the conflict in Ukraine).

Thus we have three correlated phases that will ensure the validation of the formulated hypotheses:

- *Documentary and bibliometric analysis (qualitative phase)* : In this phase, we examined strategic documents issued by NATO, EU, US Department of Defense, NASEM technical reports (2025, 2026), the National Defense Strategy, AOSR reports, but also some works indexed in international databases (Scimago, Web of Science, Scopus and Google Scholar). This allowed us to extract performance indicators for the " battle ready" innovation;
- *Benchmarking - Comparative analysis of the GUIPRR model with the traditional acquisition model.* Representative Romanian collaborative platforms were analyzed and we identified the current degree of maturity and fragmentation of the Romanian innovation ecosystem;
- *Conceptual modeling and logical validation*: Based on the extracted data, a restructuring of the US GUIPRR model was proposed to the institutional specifics of the AOȘR-Military Sciences Section.

The study tests the following research hypotheses:

I.1 - The adaptability of the GUIPRR model significantly reduces the transition time from fundamental research to operational application in the security field, by eliminating bureaucratic barriers.

I.2 – Cross-sectoral strategic governance (GUIPRR) increases resilience to hybrid, cyber and information threats, as well as other technological surprises.

I.3 - Positioning AOȘR – Military Sciences Section as a central hub for grant management (challenge-based funding) facilitates the integration of national research into international innovation networks.

The main analysis tools and techniques used were:

- Content analysis: was applied mainly to institutional reports and the DESH-3 exercise to quantify the effectiveness of AI in relation to human decision-making (tactical validity of 97%);

[13]AOSR (2026b), *Members of the Military Sciences Section*, available at https://www.aosr.ro/membrii-sectiei-stiinte-militare/, accessed on 04.02.2026.

- Strategic Assessment Matrix: was developed to compare the six critical GUIPRR components: Governance, Universities, Industry, Partnerships/Philanthropy, Resources and Resilience;
- GAP analysis: to highlight the asynchronicity between research results and the absorption capacity of the national defense industry.

The research conducted recognizes the limitations derived from the classified nature of some military data and the dependence on external collaborations for prototype testing. At the level of the AOȘR - Military Sciences Section, we appreciate that the lack of our own, officially documented laboratories determines that scientific research is dependent on external collaborations, especially for application testing.

The analysis complies with research ethics, using only open sources (OSINT) and indexed academic literature. Last but not least, we recognize that conducting semi-structured interviews (Delphi method) with security and industry experts would considerably strengthen the argumentation, which is the main objective of a future project.

## 4. GUIPRR model – conceptual foundation

The GUIRR model (Government – University – Industry Research Roundtable) was proposed by the National Academies of Sciences, Engineering, and Medicine (NASEM) in 1984. It was renamed GUIPRR (Government – University – Industry – Philanthropy Research Roundtable) in 2024, with the introduction of the philanthropic dimension.

GUIPRR focuses on the health and productivity of the U.S. research and innovation ecosystem, providing a collaborative, cross-sector platform to address the challenges that prevent leading scientific institutions from reaching their full potential[14]. This mission is accomplished by convening scientific leaders from across the research and innovation ecosystem, including senior representatives from government, academia, industry, philanthropy, venture capital, private equity, and banking, to address critical and current scientific and technological challenges, and, where appropriate, to engage in activities that address specific cross-sectoral impediments that may prevent or hinder the delivery of projects. GUIPRR/USA institutions recognize that the most pressing, actionable problems cannot be solved by a single company, university, philanthropic organization or federal agency[15].

The GUIPRR model integrates the following dimensions:

[14] NASEM (2025), *Government – University – Industry – Philanthropy Research Roundtable* , National Academies of Sciences , Engineering, and Medicine, USA, available at https://www.nationalacademies.org/units/PGA-GUIRR-24-P-598, accessed on 14.01.2026.

[15] NASEM (2026), *Government - University - Industry - Philanthropy Research Roundtable*, available at https://www.nationalacademies.org/units/PGA-GUIRR-24-P-598#work-with-us accessed on 15.01.2026.

- Strategic governance - to align research with security objectives;
- Resources unification - to avoid duplication and fragmentation;
- Institutional interaction between academia, industry and security structures;
- Results-oriented innovation process, with a focus on operational applicability;
- Collaborative networks, national and international;
- Operational adaptability - as an indicator of ecosystem efficiency, operationalized through tools to measure the speed of adaptation to changes, the duration of the decision-making process and the ability to generate effective actions in order to obtain adequate results in conditions of uncertainty, risk or crisis[16,17].

Therefore, GUIPRR provides a unique forum where participants understand each other's thinking, forming a diversity of perspectives and institutional cultures. The meetings identify those aspects that develop public-private partnerships, critical directions of scientific research, scientific training of the workforce, the effects of globalization on domestic research, but also other urgent issues of emerging technological importance that can benefit from closer and more effective intersectoral collaboration, as well as philanthropic investments.

Internationally, the GUIPRR model is applied in DARPA/USA and provides flexible funding for high-risk / high-reward projects. In the EU, the most representative structures are in Germany, which applies a dual civil-military model, with an emphasis on industrial applicability, as well as in the Nordic states, where the emphasis is on academic-industrial-public cooperation for resilience and sustainability.

## 5. Analysis and Discussion: GUIPRR Impact Assessment

In Romania, there are numerous collaborative platforms that address various directions of scientific research for technological and societal development, in the form of foundations, federations, associations, clusters, think tanks etc. These structures function as connecting environments between the private sector, academia and civil society, mobilizing financial resources and expertise for projects that often do not receive sufficient funding from the state.

For example:

[16] Seaman , R. (2022), *Deploying Forces , Enhancing Readiness , Accelerating Responsiveness* , in The Secretary General's Annual Report, 2021, NATO, pp. 19-23, available at https://www.nato.int/content/dam/nato/legacy-wcm/media_pdf/2022/3/pdf/-sgar21-en.pdf, accessed on 02.02.2026.

[17] OECD (2021), *Government at a Glance 2021*, OECD Publishing, Paris, https://doi.org/10.1787/1c258f55-en.

- The Federation of Community Foundations in Romania (FFCR) - is one of the most important collaborative platforms. Community foundations from 16 cities in Romania manage funds such as the Științescu Fund. Through this, with the support of the Romanian American Foundation (RAF), educational support is provided to children and young people passionate about that side of scientific disciplines that can hardly be described in textbooks, through experiments, practical activities and games[18].

- The Federation of Non-Governmental Organizations for Development (FOND): It is a structure that promotes the involvement of non-governmental organizations in Romania in the implementation of national and European policies of international cooperation for development. It brings together numerous associations, foundations and initiatives with the aim of educating the general public on global solidarity and sustainable development, as well as for the implementation of a coherent Romanian policy in the field of international cooperation for development and humanitarian assistance[19].

- New Strategy Center (NSC): It is a non-governmental think tank specializing in foreign policy, defense and security with a focus on the wider Black Sea region and the Balkans. It organizes regular debates (in the Chatham House regime and public), international conferences and publishes impact studies that substantiate some strategic decisions[20].

- The National Defense College Foundation: It is an education and collaboration platform that facilitates dialogue between military and civilian elites. According to its statute, the main objectives are to organize and carry out activities to affirm and defend the values, rights and fundamental interests of Romania in the field of national security and defense, to support and develop interdisciplinary scientific research and to promote Romanian and other countries' cultural values in the field of security and defense[21].

- Cyber Security Cluster of Excellence (CYSCOE): It is the largest triple helix cybersecurity cluster in Romania, bringing together companies,

[18] Slomon , G. (2024), *Fondul Știinșescu or how the future is transformed into the present. About a different kind of education, which we do not find in textbooks* , PressOne , available at https://pressone.ro/fondul-stiintescu-sau-cum-se-transforma-viitorul-in-prezent-despre-o-altfel-de-educatie-pe-care-nu-o-gasim-in-manuale, accessed on 24.01.2026.

[19] FOND (2025), *About FOND*, available at https://www.fondromania.org/despre-fond/#organizatii-membre, accessed on 28.01.2026.

[20] NSC (2025), About, New Strategy Center, available at https://-newstrategycenter.ro/en/about/, accessed on 28.01.2026,

[21] FCNAp (2025), CNAp Foundation , available at https://fcnap.ro/fundatia-cnap/, accessed on 28.01.2026.

universities, public and private institutions to develop solutions against hybrid threats and to promote research in AI and blockchain [22].

- Defence Network Romania (DEFNET.RO): It is a European platform for dual- use technologies, research, development and innovation in defence and security. It functions as an institutional accelerator that connects defence industry companies with European and national funding programmes (such as the SAFE mechanism). This project constitutes an ecosystem for the rapid formation of consortia adapted to each funding call[23].

Government Ordinance No. 26/2000 on associations and foundations regulates their establishment and operation for the purpose of developing activities of general interest, including scientific research. All of them are included in the National NGO Register, which provides good transparency from state institutions regarding their object, mission and methods of collaboration.

Thus, in the military field, innovation ecosystems formed by these complex structures ensure or monitor the rapid transfer of know-how between research and practical applications, while maintaining information security.

The comparative analysis of ecosystems highlights that innovation in the field of security is no longer defined exclusively by classical industrial capacity, but by the speed of implementation of operationally relevant technological solutions.

Currently, research and development activity in the field of national security and defense is marked by a fragmented and redundant character, which constitutes a structural vulnerability. The absence of strategic coordination determines duplication of efforts and inefficient consumption of resources, the process remaining non-transparent until the completion of the projects. In addition, there is an asynchronicity between research results and the absorption capacity of the defense industry, many solutions being anachronistic, or prematurely developed to be integrated into the production flow.

The GUIPRR model proposed for the AOȘR-Military Sciences Section would contribute to reducing this vulnerability, providing a coherent institutional framework compatible with NATO and EU practices, for unifying resources, to avoid duplication of efforts between governmental, academic and private structures. Within it, unlike classic charity, security philanthropy would finance the "missing link" between scientific theory and military prototype, a sequence often ignored by rigid state budgets. In

[22] CYSCOE (2025), Cyber Security Cluster of Excellence, available at https://cyscoe.ro/, accessed on 28.01.2026.

[23] DEFNET.RO (2025), DEFNET.RO, Defence Network Romania, available at https://defnet.ro/despre/, accessed on 28.01.2026.

particular, the lessons learned from DESH-3 support the need to implement AI in this ecosystem for innovation, through the speed of solutions proposed by these algorithms.

The adaptation of the GUIPRR model to the AOȘR-Military Sciences Section will integrate six strategic components presented in Table 1.

| Compound | Definition | Relevance for military research |
|---|---|---|
| **G** – Governance | Integrated decision-making structures and policies | Efficient coordination of research projects |
| **U** – Universities | Academies and academic research centers | Generating expertise and innovative methodologies |
| **I** – Industry | Manufacturers and private sector | Transforming research into applicable solutions |
| **P** – Partnerships and Philanthropy | Institutional and cross-sectoral collaborations | Access to know-how, standards and interoperability |
| **R** – Resources | Public and private funds, research facilities | Ensuring project sustainability |
| **R** – Resilience | Adaptation mechanisms to rapid changes | Vulnerability reduction and operational continuity |

*Table 1: Strategic components of the GUIPRR model*

GUIPRR components can support the following development directions:

| | |
|---|---|
| **Governance:** | – Creating a decision-making framework for coordinating research and innovation projects;<br>– Systems for monitoring and evaluating academic and applied performance;<br>– MApN/MCID will define operational needs and provide the legal framework and testing in polygons. |
| **Universities:** | – Strengthening the collaboration of military academic institutions with other national and international universities;<br>– Joint projects and interdisciplinary research hubs;<br>– Developing fundamental research in critical areas such as applied AI, drones or composite materials. |
| **Industry:** | – Public-private partnerships to transform research into applicable solutions;<br>– Pilot programs for testing methodologies developed within academic research;<br>– Production units take university prototypes and transform them into scalable products (mass production). |
| **Partnerships and philanthropy:** | – Collaborations with NATO, the EU and international centers of excellence, creation of permanent round tables where military leaders, university rectors and defense industry CEOs can set the research agenda for at least 5 years;<br>– Integrating best practices and international security standards; |

| | |
|---|---|
| | – Scholarships and research programs funded by philanthropic organizations will develop human capital. For example, funding for a PhD in national security may be accompanied by clauses requiring beneficiaries to work for a period within the defense or national research structures. |
| **Resources:** | – Public funds and grants for strategic projects or for participation in international research projects<br>– In the academic framework, testing sandboxes for new technologies, with mixed funding to reduce pressure on the state budget ;<br>– Accelerated technology transfer through regulations that allow intellectual property generated in universities (with philanthropic or private funds) to be rapidly adopted by the national defense industry.<br>– Strategic foundations, through philanthropic projects, could finance the stages of technology transfer to industrial production where the risk is too high for banks, but the impact on national security is vital. |
| **Resilience:** | – Creating adaptive mechanisms for rapid research and innovation;<br>– Continuity plans in scientific activities and collaborative projects ;<br>– use " technology would mean food and energy security solutions - which can support army logistics, health - collaborations for field medicine and biotechnologies applicable in theaters of operations. |

The proposed transformation for the AOȘR-Military Sciences Section involves moving from an academic forum to an active "grant hub", which will optimize a number of key aspects of the security and defense innovation ecosystem by:

- *Optimal financing mechanism*: The implementation of a mixed-fed innovation fund (state-private-philanthropy) will allow the AOȘR to launch competitions for solutions to strategic vulnerabilities established by CSAT or MApN. Moreover, attracting funds from the offset clauses for the acquisition of military equipment can revitalize Romanian research to develop local components or to train Romanian experts. In addition, many of the university innovations are not addressed and foreseen to be applied in industrial production because they are too risky for private investors and too “immature” for the rigid budgets of the Ministry of Defense. Financial support by a strategic association, through grants, can quickly resolve this issue, especially in the prototyping phase.

- *Agility and flexibility*: Public procurement for research is regulated by specific laws and regulations. A strategic association can bring together partnerships, hire international experts or acquire testing equipment and services much faster, accelerating the innovation speed;

- *Neutrality and exchange of ideas* : In a private entity, but aligned with national objectives, a neutral platform for the exchange of ideas can be managed , as well as an information space can be created where universities,

military leaders and industry CEOs can collaborate without the barriers determined by intellectual property rights or other commercial conflicts of interest;

- *Developing the human capital of professionals*: Such a strategic structure can attract talent by providing research fellowships in critical areas (e.g. AI, quantum computing, composite materials etc.) and in other research directions that are not yet widely addressed. Through the "Fellowship" model, AOȘR can become a magnet for Romanian researchers in the diaspora, accelerating the delivery of solutions by weeks or months. This will ensure a reserve of experts, military and civilian, prepared for future security challenges. In addition, a private company that would prefer to finance elite research through donations could, subsequently, recruit talent for its own development, rather than leaving all the money to the general state budget.

Possible benefits and advantages for the national innovation ecosystem in the field of national security and defense:

1. *Strengthening military research and ensuring technological sovereignty*: No longer will only "turnkey" solutions be purchased from partners, but a series of critical components adapted to national requirements and specificities will be developed;

2. *Preserving brains and increasing the visibility of national research at the international level*: Romanian researchers will be involved in projects that have patriotic and technological meaning, benefiting from funding and support for the development of knowledge.

3. *Collaboration and know-how exchanges in an apolitical form*: Such a platform can bring rival academic entities or competing companies into the same project, in an ethical, moral and neutral manner.

4. *Increasing the resilience of the academic ecosystem for security*: Increasing technology transfer from start-ups to the industry will strengthen national security, knowledge and specialization of the human capita, as well as the motivation for major players in the defense industry to support the development of testing facilities and specific laboratories.

5. Last but not least, such a transformation *could also generate long-term income*: If research funded through the AOȘR leads to the creation of a patent, this will ensure income from a share of the intellectual property rights when the industry sells the product for export (the "Royalty" strategy).

In this context, AOȘR-Military Sciences Section has the advantage of being a public interest institution, but to become a pillar of the innovation ecosystem for security and defense, it needs a structural paradigm shift.

This transformation should aim to achieve the following stages:

1. *Reconfiguring the status from academic forum to "Grants Hub"*: Currently, AOȘR functions as a consecration forum that offers titles and

prizes for scientific works published two years ago, following its own evaluation methodology. Transition to a challenge -based funding involves managing a defense innovation fund, fed by a mix of funds (state subsidies, donations from defense industry actors, philanthropic partners). Thus, through CSAT or MApN, a series of projects will be established and AOȘR will open the grant competition for researchers.

2. *Creating a board of directors that includes representatives from all four spheres of the GUIPRR model*, namely: representatives of the National Defense System structures for strategic alignment, rectors of both technical and military universities and academies for access to laboratories, CEOs of tech/defense companies for the scalability of solutions, fund managers or philanthropists to ensure financial agility.

3. *Modifying and adapting acquisition rules to simplify bureaucracy and increase philanthropic agility*: These should be based on increasing the capacity to quickly acquire software and hardware components, especially in the prototyping phases, as well as accepting risk. It can be accepted that approximately 70% of research projects may fail. However, as long as 30% of them provide a tactical advantage to military and security structures, the risk must be accepted.

4. *Structural modification and reorganization into discussion groups as project management units*. Thus, such a structure becomes the interface for validating technologies in relation to the General Staff.

**Conclusions and strategic recommendations**

The paper demonstrates that reforming the innovation ecosystem through the GUIPRR model is not just an academic option, but a strategic necessity for strengthening national resilience. Thus, it validates hypotheses I.1 and I.2, integrating the philanthropic dimension and strategic governance reducing the time of technological transition. At the same time, it increases the capacity to respond to hybrid threats, in accordance with the comparative analysis of NATO/US models.

The Military Sciences Section/AOȘR represents an academic research and publication core, with impact in the field of national security. The adoption of the GUIPRR model provides a strategic framework for strengthening collaboration between universities, industry and international partners, optimizing resources and increasing the resilience of the innovation ecosystem in the military field. The transformation of the Military Sciences Section/AOȘR is possible. This structure possessing the interdisciplinary competence necessary to act as an academic core, risk and innovation catalyst for the higher interests of the state. Thus, hypothesis I.3 is also validated.

In addition, the application of the GUIPRR model to the Romanian National Defense System will generate the following institutional functions:

1. The Government will identify and establish the list of strategic vulnerabilities (for example: hybrid threats in the context of strategic communication);

2. AOȘR-Military Sciences Section will launch a solutions competition and will immediately finance a series of student teams and start-ups from private funds/philanthropy;

3. Military universities or scientific research institutes will provide access to laboratories and accredited academic staff in the field of Military Sciences for mentoring activities in order to respect scientific rigor during the testing of solutions;

4. The military industry (state or private) will take over the winning prototype to integrate it into defense systems.

To ensure the operability of this model, the following immediate actions are necessary:

**1. Institutional restructuring**: Submitting a restructuring proposal (a strategic reform plan) to the CSAT, to transform the AOȘR from a body of high-level experts into a technological sovereignty accelerator.

**2. Legislative update**: Creating tax incentives for the philanthropic sector investing in national security and simplifying procurement rules for prototyping

**3. Public-private and philanthropic partnerships:** Implementing "offset" clauses to revitalize research in Romania through investments in local components and expert training.

This paper proposes a paradigm shift in research and development management for the Military Sciences field in Romania. The proposed solution of adopting the GUIPRR operational model offers Romania the chance to move from the stage of technology consumer to that of generator of sovereign solutions, adapted to the challenges of the 21st century.

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