PARTICIPATION GUIDELINES

Register on the Challenge: **https://assets-plus.eu/edc-iv-registration**. Participants are strongly encouraged to team up in pairs, finding a partner in a different university or country.

Write a 1 page proposal (500-600 words) on the template. The topic of this challenge is: **Leading through Complexity: Effective Management in Defence Environment**

The proposals will address strategies and approaches to deal with complexity and uncertainty in projects or operations related to Defence Industry, focusing on the following operative areas:

- Technology Management
- Data Management
- Decision-Making Process
- Risk Management
- Quality Management
- Cost Management
- Battlefield Management
- Dual-Use Management

In your proposal, a new method, strategy or approach, a new combination of existing ones, a new use of an existing ones, or a proposed research line, can be presented. Also, ideas about how to best exploit existing methods, strategies or approaches are welcome. The proposal can address technological, economic, political, regulatory, ethical and/or social aspects. The environment addressed in the proposal can be aerial, terrestrial, maritime, space-based or even conceived to operate in cyberspace.

As this is a one-page proposal, describe your ideas briefly.

Present the most pertinent points from your pitch text so that the reader has an overview of your ideas. Make sure every word counts. Avoid repetition. If relevant, insert figures. Avoid abbreviations and acronyms. If needed, provide their meanings. If references are required, add them at the end of the document.

Please, submit your **1-page proposal** before midnight CET **May 31, 2023** to: challenge@assets-plus.eu

If your proposal is selected for the second stage of the Challenge, you will be asked to expand the description to **10 pages** (5000-6000 words) which should be a development of the previously proposal, and submit it before midnight CET **October 31, 2023** to: challenge@assets-plus.eu

Download the presentation of the Launch Event here.

ADDITIONAL INFORMATION FOR THE PREPARATION OF THE REPORT

Description of the operative areas to address in the proposals

Technology Management is an essential component of effective management in the defence environment. Among the most important elements to consider we find: a deep understanding of the latest technologies and how they can be leveraged in project or missions to achieve their goals; the balancing between the need for innovation and the need for reliability and safety; the guarantee that all technologies are used in accordance with ethical and legal guidelines.

Data Management is another crucial aspect of managing in the defence environment: it involves collect, analyze, interpret, share large amounts of data and store them in compliance with privacy regulations. Near real-time and secure data sharing is paramount to make informed decisions and achieve situational awareness.

Risk Management is also critical in the defence industry, where the consequences of failure can be severe. The risks identification and assessment, and the development of the strategies to mitigate or manage them requires technical, but also consideration of political, economic, and social factors that may impact the project and mission.

The **Decision-Making Process** in the defence environment is complex and often involves a high level of risk. It requires the ability to gather and analyze information from a variety of sources. It can involve both technical experts and strategic stakeholders.

Battlefield Management involves managing personnel and resources in a combat situation. Taking decisions quickly and under pressure, while also ensuring the safety and well-being of the team, require transversal skills like high level of adaptability, resilience, strategic thinking, and a strong technical support for a smooth circulation of information among all the members of the team.

Dual-Use Management regards managing technologies and resources that have both civilian and military applications. How to balance disclosure of strategic information for national security, the possibility to leverage high-level resources and capabilities (such as cutting-edge technologies) in extreme hardship, such as disasters and emergencies, and commercialization purposes?

Quality Management ensure that all work is conducted to the highest standards of quality and that all products and services meet or exceed the required specifications and are aligned with the all the relevant guidelines and regulations.

The development of capacity and capability requires time, but the fast-changing scenario, with exponential operations, large supply network, and complex program are challenging **Cost Management**, new approaches are needed to towards a comprehensive overview of the effects and impact of the decision during the program/product life cycle.

Description of the operative context to address in the proposals

Land: The Land domain refers to all military operations that take place on the ground, including logistic capabilities and special operations.

Sea: The Sea domain refers to all military operations that take place on and under the water. This domain includes naval vessels, submarines, and maritime aircraft.

Air: The Air domain refers to all military operations that take place in the air, including drones, aircraft and missiles. The air defence operations provide support also ground troops and covers a wide range of tasks in special operations, such as strategic long-range outsized cargo transport, access in difficult geographic conditions for crisis response.

Space: The Space domain refers to all operations that take place in outer space, leveraging on satellites, spacecraft, and ground-based facilities. This domain includes space-based intelligence and satellite communications. Nearly all the national nor multinational operations are now support of space-based systems, essential to navigation, communication, meteorological, geospatial and imagery services, early warning and ballistic missile interception.

Cyberspace: The Cyberspace domain refers to all military operations that take place in the digital realm, including computer networks, software, and communication systems. This domain includes cyber-defence, cyber-attack, and cyber-intelligence. It is transversal to all the other domains, which are increasingly adopting digital technologies.

Some Articles from Scientific Journals that may help

 # Which are the competencies to manage complex projects in Defence context?

The wide skills set include technical and management competencies, together with contextual knowledge and collaboration skills

Reference: de Rezende, L. B., Blackwell, P., Denicol, J., & Guillaumon, S. (2021). Main competencies to manage complex defence projects. *Project Leadership and Society*, *2*, 100014. https://doi.org/10.1016/j.plas.2021.100014

Link: https://www.sciencedirect.com/science/article/pii/S2666721521000089

Abstract:

> "This research adds a comprehensive way of assessing competencies, contrasting with the usual reductionist approach that uses off-the-shelf instruments. The study reveals 27 competencies to manage complex projects based upon a comprehensive analysis of 22 interviews with senior practitioners associated with the most strategic projects from

the Brazilian Army. These competencies were divided into 10 groups, namely influencing, communication, team working, cognitive, management, contextual skills, professionalism, project management knowledge, and personal skills and attributes. Surprisingly, both emotional skills and social competencies were not prominent. The results contribute to advance our knowledge by revealing that practitioners involved in complex defence projects value more technical and individual competencies. This study analyses competencies across several complex projects in the defence sector, providing insights to practitioners and expanding the academic debate focused on other industries and single cases. Organisations might use the competencies to recruit, select, and develop human resources involved in complex defence initiatives."

 # How is project management evolving?

A reflection on integration and cross-fertilisation to understand how projects can address grand challenges.

Reference: Locatelli, G., Ika, L., Drouin, N., Müller, R., Huemann, M., Söderlund, J., ... & Clegg, S. (2023). A Manifesto for project management research. *European Management Review*. https://doi.org/10.1111/emre.12568

Link: https://onlinelibrary.wiley.com/doi/full/10.1111/emre.12568

Abstract:

"Project management research has evolved over the past five decades and is now a mature disciplinary field investigating phenomena of interest to academics, practitioners and policymakers. Studies of projects and project management practices are theoretically rich and scientifically rigorous. They are practically relevant and impactful when addressing the pursuit of operational, tactical and strategic advancements in the world of organisations. We want to broaden the conversation between project management scholars and other scholars from cognate disciplines, particularly business and management, in a true scholarship of integration and cross-fertilisation. This Manifesto invites the latter scholars to join efforts providing a foundation for further creative, theoretical and empirical contributions, including but not limited to tackling grand challenges such as climate change, pandemics, and global poverty. To this end, we identify five theses:

1. Projects are often 'agents of change' and hence fundamental to driving the innovation and change required to tackle grand challenges.
2. Much project management research leverages and challenges theories across disciplines, including business, organisation and management studies, contributing to developing new theories, including those specific to projects and temporary organisations.
3. 'Projects' are useful units of analysis, project management research is ideal for scientific cross-fertilisation and project management scholars welcome academics from other communities to engage in fruitful conversations.
4. As in many other fields of knowledge, the project management research community embraces diversity, welcoming researchers of different genders and various scientific and social backgrounds.
5. Historically rooted in 'problem-solving' and normative studies, project management research has become open to interpretative and emancipatory

research, providing opportunities for other business, management and organisational scholars to advance their knowledge communities."

 # Which are the challenges when developing new technologies and systems?

An effective technology assessment and strategic planning is paramount for success. Discover more about the concept of Technology Readiness Levels (TRLs), and tools for strategic planning and technology acquisition.

Reference 1: Mankins, J. C. (2009). Technology readiness assessments: A retrospective. *Acta Astronautica*, *65*(9-10), 1216-1223. https://doi.org/10.1016/j.actaastro.2009.03.058

Link 1: https://www.sciencedirect.com/science/article/pii/S0094576509002008?via%3Dihub

Abstract 1:

"The development of new system capabilities typically depends upon the prior success of advanced technology research and development efforts. These systems developments inevitably face the three major challenges of any project: performance, schedule and budget. Done well, advanced technology programs can substantially reduce the uncertainty in all three of these dimensions of project management. Done poorly, or not at all, and new system developments suffer from cost overruns, schedule delays and the steady erosion of initial performance objectives. It is often critical for senior management to be able to determine which of these two paths is more likely—and to respond accordingly. The challenge for system and technology managers is to be able to make clear, well-documented assessments of technology readiness and risks, and to do so at key points in the life cycle of the program.

In the mid 1970s, the National Aeronautics and Space Administration (NASA) introduced the concept of "technology readiness levels" (TRLs) as a discipline-independent, programmatic figure of merit (FOM) to allow more effective assessment of, and communication regarding the maturity of new technologies. In 1995, the TRL scale was further strengthened by the articulation of the first definitions of each level, along with examples (J. Mankins, Technology readiness levels, A White Paper, NASA, Washington, DC, 1995. [1]). Since then, TRLs have been embraced by the U.S. Congress' General Accountability Office (GAO), adopted by the U.S. Department of Defense (DOD), and are being considered for use by numerous other organizations. Overall, the TRLs have proved to be highly effective in communicating the status of new technologies among sometimes diverse organizations.

This paper will review the concept of "technology readiness assessments", and provide a retrospective on the history of "TRLs" during the past 30 years. The paper will conclude with observations concerning prospective future directions for the important discipline of technology readiness assessments."

Reference 2: Kim, B., Cho, Y., & Yang, M. G. (2019). Technology Acquisition Strategy: A Latecomer's Perspective on Integrating Component Suppliers With System Integrators. *IEEE Transactions on Engineering Management*, *69*(6), 2572-2587. https://doi.org/10.1109/TEM.2019.2947698

Link 2: https://ieeexplore.ieee.org/document/8889691

Abstract 2:

> "Having unique market structures divided between a few buyers (military or airliners) and a few oligopolistic producers, as well as requiring several millions of components, the aerospace industry has the typical feature of a complex structure. Due to the complexity of operational procedures, strict safety regulations, and reliability requirements, close cooperation between manufacturers and suppliers is critical in developing new products based on the operational plan that incorporates customers' needs. Thus, it is necessary to have a systematic planning and technology acquisition procedure that considers these various aspects. However, research has paid little attention to strategic technology learning and acquisition procedures in detail and practical guidelines through which system integrators and suppliers strategically cooperate in sharing strategic development plans. In this regard, we analyzed the case of "T-50," the first indigenous supersonic advanced trainer introduced by Korea Aerospace Industries in 2005, to investigate the associations between system integration and components in development phases. Not only did we examine how the structures of technology dependence and operations in R&D phases manifest but also identified discrepancies between system integrators and suppliers. Finally, we provided strategic actions for latecomers to effectively acquire core technologies in accordance with both technology absorptive capability and the types of product architecture. This article helps firms to build both strategic technology planning and managerial capabilities in the complex product system industry. The proposed framework provides a detailed strategic planning process in the development phase and includes technology acquisition and R&D project plans between system integrators and suppliers for creating new products."

PODCAST EU Defence Declassified

A new podcast from European Defence Agency on European Defence sector.
The episodes *"Why do we need EU defence?"* and *"Towards an EU defence industry"* unveil needs and challenge of cooperation among Member States and in the industry. Check this out!
https://open.spotify.com/show/42iIR4rrBHKm8IVxHvPJnf