CDE4Peace

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CONCEPT DEVELOPMENT AND EXPERIMENTATION FOR EU CONFLICT PREVENTION AND PEACE-BUILDING (CDE4PEACE)

D5.1

Requirements for an innovative CDE tool

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Executive Summary

This deliverable presents the results from Phase 3 (INNOVATE) of the CDE4Peace project and the respective Work package 5 (Innovate) in which the requirements for a potential new Concept development and experimentation (CDE) tool for European Union (EU) conflict prevention and peace-building have been defined. The innovative CDE tool is designed as a simulation tool for training and experimentation of EU peace-building missions and operations. This applied research work contributes to the project's innovation objective and marks the attainment of milestone no.4.

1. Introduction

One of the specific objectives of the CDE4Peace project is to introduce and adapt the Concept development & experimentation (CDE) methodology to EU conflict prevention and peace-building by defining the requirements for an innovative CDE tool tailored for this specific policy area. The project's main contribution is to explore the potential of CDE as a new methodological and technological solution for testing and validating concepts in the sensitive policy area of EU conflict prevention and peace-building. In doing so the CDE4Peace project draws on previous research work under the EU's research and innovation programme Horizon 2020 and the analysis of available commercial-off-the-shelf products on the European market. Some H2020 research projects – most notably PeaceTraining.eu (https://www.peacetraining.eu/) and GAP (https://gap-project.eu/) – have focussed on the use of information and communication technologies (ICTs) for training of personnel in the field of EU conflict prevention and peace-building. In other H2020 projects research has been carried out on the role of peace-tech for EU conflict prevention and peace-building (Gascell, et. al. 2016; De Zan, et. al. 2016). There is a clear research gap between concept development at the policy and academic level, on the one hand, and the use of ICTs for EU conflict prevention and peace-building, on the other. CDE4Peace contributes to bridging this interdisciplinary and epistemological gap by exploring the potential role of CDE tools for experimenting novel concepts in the area of EU conflict prevention and peace-building and by defining the requirements for a CDE tool tailored for this specific EU policy area. The requirements have been defined drawing upon the review of concepts (Phase 1) and CDE technology assessment (Phase 2) of the CDE4Peace project.

The requirements for the CDE tool have been defined by combining the Institutionalist approach from EU studies with CDE methods such as modelling and simulation (M&S). The Institutionalist approach to the study of the EU's Common Security and Defence Policy has been widely employed in scholarship (see, for example, Howorth, 2014; Smith, 2017). Combining the Institutionalist approach with applied research under the CDE4Peace project is innovative and demonstrates the project's considerable added value. The requirements have exclusive focus on civil applications in line with the traditional notion of the EU as a 'civilian power' (Duchêne, 1972).

2. Why the CDE tool is needed?

Overall, research on EU conflict prevention and peace-building is not adequately supported by experimentation and lacks an experimental phase. This is a major problem of the research-policy interface as it is practically impossible to validate the emerging new strategic, operational and bureaucratic concepts in this EU cross-sectoral policy area. To great extent the proposed novel concepts and approaches remain unverified political and academic speculations. The complexities of policy implementation warrant the introduction of experimental methods in the research and policy practice. In this context, the CDE4Peace project addresses the problem with deficiencies in experimental methods to bridge the gap between theorising and conceptualising, on one side, and experimentation, on the other.

Research on EU conflict prevention and peace-building is embedded in the social sciences at the crossroads between international relations, European studies, peace and conflict studies, defence and strategic studies. Similar to other social science disciplines research on EU peace-building and the related Common Security and Defence Policy (CSDP) is not inclined to experimentation. This has to do with the historical origins of social science disciplines (including CSDP scholarship), the dominant research methodologies and practices, and the technology readiness levels of the available experimentation tools. The downside of methodological traditionalism, though, is stagnation in research on EU conflict prevention and peace-building. As noted by Webster and Sell (2014) the sound theoretical foundations of experimental research offer a strong likelihood of producing an increase in the understanding of social phenomena. Laboratory experiments in the social sciences developed most rapidly in the years since the end of World War II, fostered by technological progress. An intrinsic link exists between new technologies and experimental methods in the social sciences. One of the earliest attempts to undertake experimental research in the social sciences has been done in the 1960s in the field of conflict studies (Deutsch et. al., 1967). Experimentation has gradually infiltrated some subfields of political science but the use of experimental methods is still not widespread in international relations (McDermott, 2011). As noted by McDermott (2011, 504) experiments can offer unique advantages to international relations scholars. They can provide precise methodological control, unparalleled causal insight and innovative theoretical clarification and direction. It has been suggested that one of the main purposes of experiments in international relations is theory and hypotheses testing (Mintz et. al., 2011).

A promising set of experimental research methods have been developed over the last 20 years in NATO under the so-called Concept Development and Experimentation (CDE) process. The innovative CDE policy process, which originates from the military domain, is the application of the structure and methods of experimental science to the challenge of developing future defence capabilities (De Nijs, 2010). Exploring the potential of NATO's Concept Development and Experimentation for EU conflict prevention and peace-building is worthwhile as CDE is one of the very few available options for state-of-the-art experimental methods on the international R&D market. Similar to NATO, CDE methods and tools could be applied to the EU not only in terms of introducing experimental methods for research purposes but also to help inform policy-making.

3. What is the policy context of EU conflict prevention and peace-building?

EU conflict prevention and peace-building is framed by the wider EU Common Security and Defence Policy (CSDP) and the Common Foreign and Security Policy (CFSP). These interrelated and overlapping EU policy areas are widely considered to be mostly intergovernmental in nature. The role of Member States in defining the EU's policy objectives in these areas remains very high, while the number of the competent EU bodies is steadily on the rise. A tentative list of the EU institutions involved in policymaking in the area of conflict prevention and peace-building should include as a minimum the European External Action Service (EEAS), the European Parliament, the European Commission (and, specifically the Service for Foreign Policy Instruments), the Council of the European Union, the European Council, the Political and Security Committee (PSC), the Committee for Civilian Aspects of Crisis Management, the EU Military Committee, the EU Military Staff (part of the EEAS), the European Defence Agency (EDA), the Military Planning and Conduct Capability (MPCC) and the Civilian Planning and Conduct Capability (CPCC). Cooperation and coordination among this multitude of actors is difficult to achieve. There are considerable policy limitations for the development of effective and efficient EU conflict prevention and peace-building. Therefore, the policy context in this cross-sectoral policy area is very complex by default. Despite these objective constraints the EU has achieved some progress in terms of policy initiatives such as the European Peace Facility (EPF) and the Permanent Structured Cooperation on security and defence (PESCO).

In the period 2020-2022 the policy context was marked by the Covid-19 pandemic and even further complicated by a deteriorating security situation on the EU's borders. The pandemic posed several challenges for CSDP missions and operations, with a number of deployments witnessing infections of personnel. Nevertheless, the Council of the EU continued to extend the mandate and tasks of several CSDP missions and operations (Fiott and Zeiss, 2021, p.150). The major EU initiative at the politico-strategic level in 2020-2021 was the Strategic Compass which was launched to enhance and guide the implementation of the EU's level of ambition for security and defence. More specifically, the Strategic Compass is expected to provide concrete operational guidance and objectives in the areas of crisis management, resilience, capabilities and partnerships.

The work on the Strategic Compass was accompanied by a broader political debate on the meaning of strategic autonomy (Fiott and Zeiss, 2021, p.23, p.165). A most effervescent debate played out between the German defence minister Annegret Kramp-Karrenbauer, and the French president, Emmanuel Macron, over the notion of EU strategic autonomy and the role of America as a security provider. HR/VP Borrell contributed to the discussion with the observation that 'strategic autonomy is a process of political survival'. As noted by Mauro (2021) the relationship that EU leaders have with the concept of strategic autonomy is as ambiguous as the relationship between the two main characters of that 1977 Luis Buñuel movie, "That Obscure Object of Desire". Therefore, the requirements for a European CDE tool in support of conflict prevention and peace-building should be aligned with the complexities of the EU policy process and the meandering political framework.

4. What the finished product will be like?

The final product is designed to be an innovative simulation tool for training and experimentation in the area of EU peace-building missions and operations. The focus is on missions and operations as the main policy outcomes from EU policymaking in the areas of the CSDP, CFSP and EU external action. Over the last 20 years the EU has launched over 35 peace-building missions and operations in conflict-stricken countries. Lessons learned from international peace-building clearly show that training and experimentation through simulation tools could enhance the planning and execution of EU missions and operations. The requirements for the tool can serve as the basis for the development of an actual simulation platform for EU peace-building missions and operations in follow-up projects.

By combining the 'technology watch' method with qualitative interviews the CDE4Peace project has identified on the European market 11 tools which could be used for concept development and experimentation purposes in the EU policy area of conflict prevention and peace-building (Pavlov, 2021). The CDE-related tools are very diverse: software tools, simulation systems and platforms, command and control systems, virtual environments, knowledge bases (indexes) and serious games. About half of the tools identified are simulation systems. Overall, the tools identified are applicable to strategic and operational concepts in EU conflict prevention and peace-building but they are not tailor-made for this EU policy area. Therefore, the requirements for a CDE simulation tool in support of EU conflict prevention and peace-building can make use of the available tools to a very limited extent. Moreover, all tools are defended by patents and the detailed technical descriptions actually represent trade secrets. Very importantly, the available CDE-related tools are mostly designed for training and not for experimentation.

The CDE tool for EU conflict prevention and peace-building should be a scenario-driven simulation tool for training and experimentation based on constructive and virtual simulation. It should be able to model and simulate EU missions / operations at the tactical, operational and strategic level. The constructive and virtual simulations should make it possible to develop and experiment the behaviours and decision-making processes of EU actors, mission and operational personnel within the conflict context of a realistic operational environment. The CDE tool must also include an integrated trial and experimentation management system. Experimental criteria, questions sets and objectives should be mapped in the system to activities most suited for analysing the hypothesis or objective of the experiment.

5. Methodology and technical approach

The concept for the innovative CDE tool is designed by employing the Concept development and experimentation methodology from NATO's defence planning and capability development process (NATO CDE Handbook, 2021). CDE is a combination of methods and tools that drives NATO's transformation by enabling the structured development of creative and innovative ideas into viable solutions. Modelling and simulation (M&S) play an important part in the CDE methodology within NATO (Biagini and Pietzschmann, 2019). M&S provides methods, techniques and tools that can be applied to support CDE from a mere visualization to simulation-based experiments and analyses.

The technical approach and methods of the CDE tool are based on state-of-the art work in the area of peace-tech and gaming for peace. The use of technologies for peace-building, and specifically in EU peace-building has been growing steadily over the last years. State-of-the-art work has focussed on the transformative potential of peace-tech and the need to adopt a socio-technical perspective to EU peace-building (Gascell et. al., 2016). Gamification techniques and scenario development are the most promising approaches in terms of training with the CDE tool. Unlike wargaming gaming for peace is a comparatively new area with only few tools developed. One of the recent examples is the 'Gaming for peace' online role-playing game which has been developed under the EU-funded GAP project (https://gap-project.eu/). Another relevant tool is the EU-funded PeaceTraining.eu platform which includes a knowledge base, a database of training providers and training curricula for conflict prevention and peacebuilding personnel (https://www.peacetraining.eu/). The EU-funded FORESIGHT project aims to develop a federated cyber-range solution to enhance the preparedness of cyber-security professionals and advance their skills by an ecosystem of networked realistic training and simulation platforms (https://foresight-h2020.eu/). The CDE4Peace project draws on experience from GAP, PeaceTraining.eu and FORESIGHT to develop the concept of the innovative CDE tool – designed as a platform – that could be built around the CDE methodology.

6. Operational concept of the tool: CDE platform for simulation in EU peace-building

The principal objectives of the CDE platform are: 1) to improve human performance in EU peace-building missions and operations through training; 2) to improve mission and operational planning through experimentation. The main innovation of the CDE platform is in that it goes beyond training in the area of experimentation of EU peace-building concepts. Exercise-based experiments are a source of great competitive advantage in the CDE methodology (De Nijs, 2019, p.6). In the EU context which is framed by a still not fully developed Common Security and Defence Policy (CSDP) peace-building training and experimentation are closely connected and hardly separable in institutional and organisational terms. Therefore, the experimentation objectives in the CDE platform are aligned with exercise and training goals. The target audience of the platform is EU peace-building personnel from missions and operations on the ground as well as EU officers in Brussels-based EU institutions, most notably the European External Action Service (EEAS), the Commission services, the Council of the European Union, the European Council, the Political and Security Committee (PSC), the Committee for Civilian Aspects of Crisis Management, the EU Military Committee, the EU Military Staff, the European Defence Agency (EDA), the Military Planning and Conduct Capability (MPCC), and the Civilian Planning and Conduct Capability (CPCC). The platform can be used both in a training and experimentation mode of operation. As shown on fig.1, the CDE platform is comprised of two modules, a training module and an experimentation module built around M&S methods, techniques and tools.

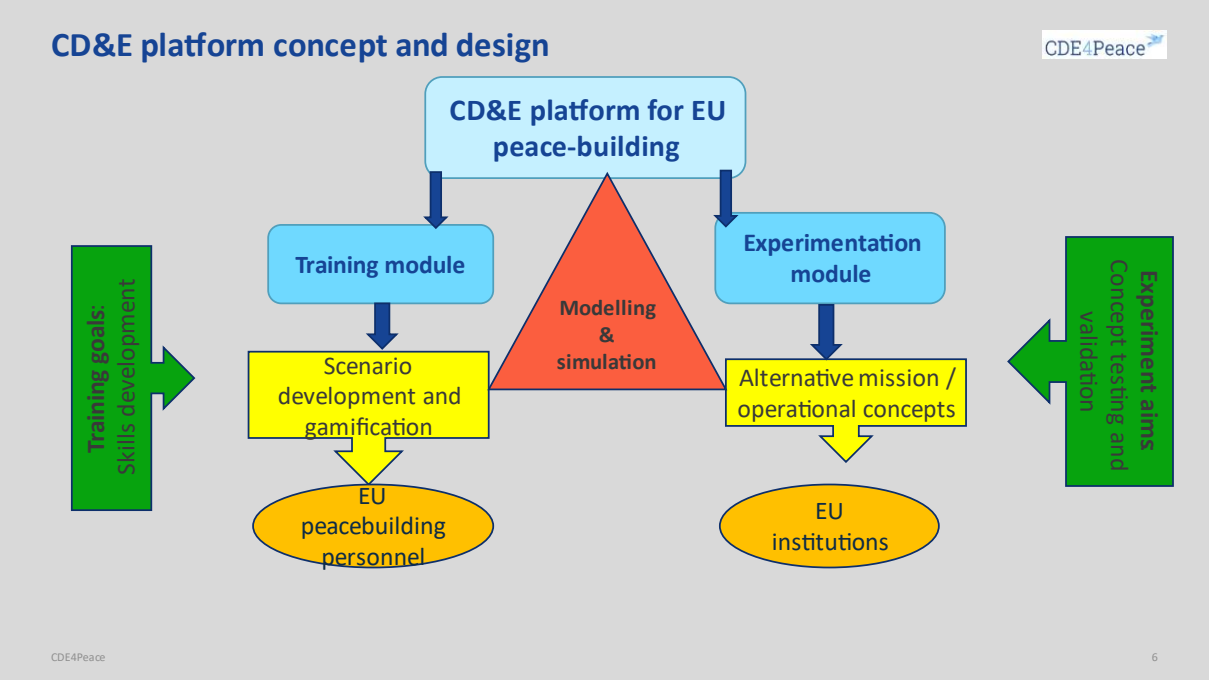

Fig. 1. CDE platform concept and design

Training module: overview and system requirements

The training module of the CDE platform is designed as a scenario-driven multiple-player online role-playing visual game. It is a collective training tool driven by scenarios which take place in a fictitious conflict-stricken country where an EU peace-building mission is deployed. It aims at enhancing the experience of the user when interacting with the platform (e.g., to select from a list of training scenarios, view scenarios in different categories either by difficulty level or by training area) and

introduce formal game elements. The training audience consists of EU peace-building personnel from EU institutions and EU member states. The training audience interacts with the game by role-playing and progressing the scenario through choices. The game has multiple possible ways to progress through its storyline and has multiple endings to reflect the player's choices. The scenario events, injects, cues, prompts and stimuli are storyboarded. The directing staff (DiStaff) of the exercise has the responsibility to facilitate, umpire and adjudicate the game and to draft lessons learned.

The training module has an inbuilt curriculum in peace-building skills as well as an assessment of those skills. The player is assessed before during and after the game. Success in achievement of the training objectives is measured by performance indicators, such as new skills and knowledge acquired, improvement of cultural awareness, conflict sensitivity and interoperability among the players, and the overall level of attainment of the mission objectives. In terms of M&S methods and tools the training module employs visualization, 3D modelling and simulation and gamification techniques.

The training module is designed as a gamification module which applies gamification schemes and mechanisms in the CDE platform. The training module provides the ability for users to monitor their own progression and to engage them during their interaction with the platform. To achieve higher efficiency, it is implemented as a Moodle plugin, having an internal database. Moodle is a learning platform used to augment and move existing learning environments online; it has been chosen as it is currently the most popular learning management system (https://moodle.org/). Based on the experience from the FORESIGHT platform (Kolokotronis, et. al., 2019), the main requirements for the training module in the CDE platform are, as follows:

- Maximize the engagement and re-engagement of users;
- The training module should allow users to manage their profile in respect to trainees' badges and achievements;
- The module should assign reward scheme to scenario;
- The module should maintain / present scores per trainee;
- The training module must provide achievements and track the user's progress on these;
- The training module must be able to utilize the user's performance and provide awards accordingly.

Experimentation module: overview and system requirements

The experimentation module of the CDE platform is designed and based upon the research finding that mandates are pivotal in EU missions and operations (Pavlov, 2020). Mandates represent the EU's intentions and shape the respective mission / operation throughout its life-cycle. Hence, the experimentation module of the platform is mandate-driven and scenario-based. The main objective is to experiment and validate alternative mandates and operational concepts within scenarios. Operational concepts govern the conduct of EU peace-building missions/operations. Operational concepts in the EU are framed mainly by three documents – the Crisis Management Concept (CMC), the Concepts of operations (CONOPS) and the Operation Plan (OPLAN).

The experimentation module of the CDE platform employs the M&S method of simulation-based experiment. It is designed to experiment alternative EU mission and operational concepts and mandates (e.g., executive vs. non-executive mandate; civilian vs. military or civil-military missions /

operations). Alternative operational concepts are measured against quantifiable peace indicators and by concept testing as a structured CDE technique (Norman and Fenning, 2019). The simulation of EU peace-building operational concepts is innovative and draws on virtual and constructive simulations traditionally employed in wargaming. A wider number of peace actors and societal groups must be added to improve the level of fidelity in line with the EU's comprehensive and whole-of-society approach to peace-building.

Experimentation is by its nature open ended and will be carried out based on open ended scenarios of EU peace-building missions and operations. The CDE platform's experimentation module should provide a state-of-the-art environment for exercise-based experiments. Drawing on experience from the German Armed Forces synthetic wargame KORA (KORA, 2019), the experimentation module in the CDE platform is designed to set up the database for an exercise supported by an integrated scenario generator with a graphical tree structure editor. It should provide libraries of predefined but editable operational concepts and mandates and numerous schemes for typical force structures. In addition, it is also possible to define elements of previously unknown types of mandates and operational concepts. The module should allow the modification of mandates and operational concepts by parameter editors. The simulation terrain can be modified using commercial GIS tools. The module should be able to simulate operations in terrain data of all kind of climate zones. For the evaluation of exercises visual and database-assisted functionalities should be incorporated. These functionalities should include complete archives of the situation data for the entire duration of an exercise. The module should support the alternative analysis of operational concepts and mandates based on accumulated statistical data from a relational database exported to MS Office formats.

7. At what stages of EU peace-building missions the tool could be applied?

One of the main theoretical assertions in academic literature on EU conflict prevention and peace-building is that conflicts consist of four stages (Smith et. al., 2018). Based on 'conventional wisdom' arguments the four phases are defined as follows:

- Conflict prevention – impending crisis phase
- Crisis response - outbreak of violence phase
- Conflict management and mitigation - war phase
- Conflict resolution and peacebuilding – post crisis phase

The conflict cycle phases frame the EU policymaking process and the different stages of EU peace-building missions and operations. Conflict prevention corresponds to the planning of peace missions (operations); crisis response and conflict management correspond to the launching and implementation of peace missions (operations); and the post crisis phase corresponds to the final phase of lessons learned and evaluation of EU peace-building missions (operations). Of course, these policymaking stages might overlap and the country may relapse into conflict. Nevertheless, the conflict cycle adequately frames the stages of EU peace-building missions and operations.

The CDE platform with its training and experimentation module can successfully be applied in the planning stage of EU peace-building missions and operations. A major challenge to the EU's planning and decision-making structures is the diversity of interests that need to be accommodated in order to reach a unanimous consensus, but also the EU tendency to sometimes work with overly rigid and hierarchical templates, and prioritise coherence over timely response (Meyer, 2020, p.10). A key problem at the planning and decision-making stage is the availability of timely, reliable and actionable intelligence for all EU member states. Too often, member states do not arrive at a shared assessment of the situation on the ground quickly enough, let alone an agreement on how the EU could have responded. In this context the CDE platform could support the EU mission / operational planning process by offering a playground for testing and experimenting alternative scenarios, mandates and operational concepts. This will certainly be helpful for drawing up a first Crisis Management Concept (CMC), developing the Operational Concept (CONOPS), creating a detailed Operational Plan (OPLAN) and achieving a Council decision to launch an operation. NATO's experience in employing the CDE methodology clearly shows that the meaning of CDE is not only in achieving scientifically credible results but also in enhancing cohesion within NATO (Pavlov, 2021). The NATO CDE process could be interpreted as a specific civil-military ritual in the alliance. Experimentation on the CDE platform could enhance cohesion between the EU member states and the relevant EU institutions involved in the planning of peace-building missions (operations) – the Political and Security Committee, the EU Military Committee and Staff, the Committee for Civilian Aspects of Crisis Management (CIVCOM), the Crisis Management and Planning Directorate, and the Civilian Planning and Conduct Capability (CPCC). In addition, the training module could be utilized for training purposes of EU peacebuilding personnel even before the mission planning has started.

It is not realistic to expect the CDE platform to be used in the launching and implementation of peace missions (operations). Being not an operational tool, the platform cannot be directly employed for operational purposes.

The CDE platform could be used in a meaningful way in the lessons learned stage of EU peace-building missions and operations when the operation's overall performance, impact, strengths and weaknesses are being evaluated. Lessons learned identified with the support of CDE methods could be used in planning future CSDP operations. 'Experiential institutional learning' is a well-developed concept in the realm of EU conflict prevention and peace-building under the EU-CIVCAP project (https://eu-civcap.net/). 'Experiential institutional learning' is defined as the need for changes in an institution's responsibilities, functions, rules, procedures, resources and capabilities as a result of new information, observation, or experience (Smith, 2017). By introducing the CDE methodology and the CDE platform in the lessons learned stage the concept of 'experiential institutional learning' could be extended beyond experience into the realm of experimentation. Experimentation with alternative operational concepts and peace-building mandates could give clear added value in the lessons learned stage when the actual impact of a mission / operation can be evaluated. It should be noted that so far CDE methods have been used neither in the planning nor in the lessons learned phase of concrete CSDP missions and operation (Interview, 09/03/2021).

8. Conclusion: potential of the tool for experimenting alternative governance models

The 'grand' theoretical debates on the CSDP and EU conflict prevention and peace-building are centred around two approaches: intergovernmentalism and neofunctionalism. The intergovernmental approach is focussed on the role of member states and the bargaining process, while the neofunctionalist approach highlights the critical interactions among transnational interest groups and supranational EU actors in advancing EU integration (Hooghe, L. and Marks, 2019). What both theoretical approaches lack are experimental methods to support the theoretical insights. More specifically, the CDE methodology and the CDE platform could support the testing and validation of alternative governance models and institutional architectures derived from intergovernmentalism and neofunctionalism. Intergovernmetalism models will be based on the predominant role of member states, while neofunctionalist models will be based on the role of EU supranational institutions. Of course, the possibility of a supranational intergovernmentalism model (Howorth, 2012) could also be experimented. Defining and experimenting governance models in the cross-sectoral area of EU conflict prevention and peace-building is very important for enhancing the academic and policy debates. Only one EU research project so far has assessed in a comprehensive way existing governance structures and policy processes related to the multiple domains of the EU's external action (https://www.engage-eu.eu/). The ENGAGE project however has not engaged in experimenting alternative governance models.

Secondly, the CDE platform has the potential to support the development and refinement of EU strategic concepts in the area of conflict prevention and peace-building. By exercise-based experiments the CDE platform can confirm or disprove a concept-related hypothesis, or formally validate a strategic concept. Only valid experiments can ensure that a concept is tested objectively and validated. Strategic-level exercises (live or simulation) conducted on the CDE platform could provide the opportunity for experimenting strategic concepts in a safe and controlled environment. The ability of the EU to conduct strategic-level CDE exercises with strategic autonomy-framed scenarios would be a major test for this most topical EU strategic concept. The symbolic and cohesive power of a regular EU-wide strategic autonomy CDE exercise under joint French-German leadership could be very high.

Finally, the ambitions of the EU as a peace-building actor on the international arena warrant the development and application of state-of-the-art tools for training and experimentation. Presently, there are no available tools tailor-made for EU peace-building. The concept for the CDE platform has been designed by employing NATO's Concept development and experimentation methodology and adapting it to the training and experimentation needs of the EU with a view to a potential commercialisation. As an emerging solution the innovative CDE platform has the potential to provide a public good at the European level but also to fill in an existing market gap.

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