

CDE4Peace

REVIEW | ASSESS | INNOVATE | RECOMMEND

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

D4.1

Catalogue of available and emerging CD&E tools in the European Union

Nikolay Pavlov

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Executive Summary

This deliverable presents a catalogue of available and emerging concept development and experimentation (CD&E) tools in the European Union (EU). The catalogue has been prepared under the CDE4Peace Work package 4 (Assess). By employing the ‘technology watch’ method to the ICT market in the EU, the project has identified and assessed 11 tools which could be used for concept development and experimentation purposes in the EU policy area of conflict prevention and peacebuilding. The wide variety of CD&E-related tools developed in the EU include software tools, simulation systems and platforms, command and control systems, virtual environments, knowledge bases (indexes) and serious games.

Introduction

The catalogue of available and emerging Concept development and experimentation (CD&E) tools in the European Union has been prepared in Phase 2 (Technology assessment) of the CDE4Peace project under Work package 4 (Assess). The main objectives of WP4 are identification and technology assessment of available and emerging Concept development and experimentation (CD&E) tools on the European market, and evaluation of their potential for EU conflict prevention and peacebuilding. This catalogue is the major deliverable from the Technology assessment. The catalogue presents available and emerging CD&E tools and evaluates their potential and applicability to the European Union's policy area of conflict prevention and peace-building. The empirical research work has been carried out by applying the 'technology watch' method¹ to commercial-off-the-shelf CD&E tools and taking into account the limitations for data collection in the commercial sector. The project and, respectively this deliverable do not aim at disclosing trade secrets. The acquisition of CD&E software packages is costly and is not realistic for a project of this scale. Companies are not willing to provide access to software for academic purposes. Hence, the empirical work has been focussed exclusively on open source data collection. In this respect the catalogue draws on the technology assessment done under the Peacetraining.eu project² and goes beyond training into the realm of concept development and experimentation. Desktop data collection has been conducted by monitoring the websites of relevant companies and research and technology organizations. Another important open source for desktop data collection have been CD&E software reviews in specialized journals. Due to the COVID-19 pandemic and the cancellation of major European industrial exhibitions the fieldwork was organised online and interviews with company representatives have been conducted online via e-mail, skype or Webex. Tailor-made questionnaires have been prepared and qualitative interviews with representatives of relevant companies, developers and end-users have been conducted. The aim of the qualitative interviews was to contextualize the data collected and to provide an in-depth insight into the European CD&E technology field. Based on the data collected the catalogue has defined the TRL (Technology readiness level) of the available and emerging CD&E tools in line with the Horizon 2020 TRL definitions.³ The TRLs actually reflect the level of maturity of the solutions. The catalogue assesses the usability and applicability of the identified CD&E tools to the European Union's policy area of conflict prevention and peace-building. Wherever possible and based on the data collected technological gaps and shortcomings in existing tools have been identified.

¹ Final recommendations towards a methodology for technology watch at EU level (STACCATO deliverable 2.2.1), European Commission JRC, 2009.

² Technology assessment and modern e-approaches report (D4.4 from the Peacetraining.eu project), SYNYO GmbH, 2018.

³ https://ec.europa.eu/research/participants/data/ref/h2020/wp/2014_2015/annexes/h2020-wp1415-annex-g-trl_en.pdf

Concept development & experimentation tools on the European market

Advanced CD&E Environment (TNO ACE)

CD&E tool:	Advanced CD&E Environment – TNO ACE
Company / organization:	TNO – Netherlands Organization for Applied Scientific Research
Country:	The Netherlands
Link:	https://www.tno.nl/en/focus-areas/defence-safety-security/roadmaps/operations-human-factors/tno-ace-advanced-cd-e-environment/
Description:	<p>TNO ACE is a virtual world in which experiments can be methodically conducted (e.g., on sensors, new weapon systems, new forms of communication and information exchange). TNO ACE provides a virtual environment for experiments. TNO ACE offers easily configurable brainstorming and simulation facilities based on a large set of simulation and analysis tools, and domain knowledge. It provides access to national and international (secure) simulation networks to enhance international cooperation.</p> <p>To manage the CD&E process at TNO ACE a framework of Concept Maturity Levels (CML) is used. The CML framework contains a number of milestones along which the concept evolves. The methods applied under the CML framework in TNO ACE are, as follows: structured brainstorming (CML 1-2); serious gaming (CML 2-3); virtual experience by interactive human-in-the-loop simulations (CML 3-4); and live experience through exercises (CML 4-5).</p> <p>TNO ACE assists and guides defence professionals in the purchase of new systems and the development of future ways of operating. TNO ACE is more than a virtual world in which the armed forces can experiment with new capacities; it can play a role in the development of new technologies. TNO ACE stands for the structured and methodological way in which these experiments are set up and conducted. Operational environments and scenarios can be imitated in exercise halls. Simulation models and tools are applied to evaluate the effectiveness and cost of new concepts and potential new technologies in all their aspects. In this way, weapon systems can be tested carefully in a virtual operational environment before being purchased.</p> <p>TNO ACE is not limited to one physical environment. Owing to its modular structure, which can be adapted to suit requirements, it can be distributed over different locations. TNO ACE has already proved useful in various experiments. Examples include the Joint Common Operational Picture</p>

	experiment, Single Picture Integration for Territorial Water Surveillance, a Counter Improvised Explosive Device demonstration and an Above Water Warfare experiment.
Keywords:	Concept Maturity Levels (CML); acquisition; simulation tools; serious gaming
TRL (Technology readiness level)	TRL 8/9
Potential for EU conflict prevention and peacebuilding	TNO ACE has good potential for operational concepts in the European Union's policy area of conflict prevention and peacebuilding. Concept Maturity Levels (CML), simulation tools and exercises can be used for experimenting operational (and mission) concepts of EU peacebuilding operations and missions.

Datalab

CD&E tool:	Datalab
Company / organization:	The Hague Centre for Strategic Studies (HCSS)
Country:	The Netherlands
Link:	https://hcss.nl/datalab/
Description:	<p>The Datalab is a specialized evidence and knowledge base developed by The Hague Centre for Strategic Studies (HCSS). The knowledge base is used as the foundation on which the HCSS builds geostrategic analyses. Until fairly recently, the fields of foreign, security, and defence policy analysis had few other options but to rely on mostly qualitative expert analysis and opinion. The Datalab gives the way for quantitative methods for machine-based and data-driven analysis.</p> <p>The Datalab was developed to map countries at risk in a GIS system, based on open-source data. The focus is on intra-state conflicts (civil wars). 50 drivers of vulnerability which have relationship with political instability are defined. The Datalab is supported by various existing predictive econometric models and automated event data. The latest generation models employ machine learning to generate conflict predictions at the sub-national (district) level with a time horizon of 1-24 months. In the context of climate change, specific climate-related conflict models have been developed within the global Water, Peace and Security (WPS) Consortium. The Datalab's next generation causal conflict models seek to disentangle various conflict pathologies and the interaction effects between different drivers that lead to conflict in order to a) arrive at a better and more formal understanding of conflict onsets and b) with the 'black box' opened, to facilitate the development of targeted policy interventions.</p> <p>The HCSS Datalab's StratBase leverages a wide array of over 11,000 variables from various open and proprietary datasets. Many of these datasets are of a numerical origin (e.g. economic, financial, military, values, etc. country-year datasets), but increasingly they are also extracted from text- and even image/video- or audio-based – sources. The datasets are processed with data-driven algorithms and analytical frameworks to map and track global geodynamics, conflict lifecycles, political and security risks both offline as well as in cyberspace, great-power assertiveness, the behavior of pivot-states, access to natural resources, changing insights about the future, and many other phenomena that are of key importance to international interactions.</p>
Keywords:	Conflict models, data-driven analysis, knowledge base
TRL (Technology readiness level)	TRL 7/8

Potential for EU conflict prevention and peacebuilding	The DataLab's StratBase and models can be used in the European Union's policy area of conflict prevention and peacebuilding in three ways: 1) the portfolio of predictive models; 2) the causal conflict models (conflict pathologies); and 3) the policy intervention models for conflict interventions.
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Exonaut

CD&E tool:	Exonaut
Company / organization:	4C Strategies
Country:	Sweden
Link:	https://www.4cstrategies.com/exonaut/
Description:	<p>Exonaut is a readiness management software platform, comprising fully integrated solutions for risk, business continuity, crisis management, compliance, training and exercises. It is an integrated platform for risk, business continuity, crisis and exercise management. The software suite provides tools for building, verifying and tracking organisational readiness. Exonaut has become the global de facto standard for military training and exercise management software. The highly scalable and configurable platform enables allied forces across the globe to plan, programme, design, manage and optimise complex exercises, training progressions and experimentation. Data driven, it enables users to assess, visualise and exploit training data in order to enhance decision support, build capabilities and increase training readiness.</p> <p>Exonaut's Command and Control is an emergency management solution to support mission-critical decisions – from the control room to the front lines. The system provides a comprehensive incident overview with map-based situational awareness, asset tracking, incident logs and custom dashboards. Exonaut has been developed, and continues to evolve, to respond to frontline requirements from the military, police, fire and emergency medical services.</p> <p>Exonaut is designed to be used by risk managers, security officers, compliance officers, and exercise managers to support them in their day to day operations. The reports and dashboards are meant to give senior level management an overview of the current readiness levels (risk exposure, compliance, training status, risks etc). Data capture interfaces are designed to support first line operators with limited or no domain knowledge, by using simple and clear interfaces. Second and thirds line assurance on the other hand has access to intuitive interfaces to slice and dice the data as appropriate for analytical purposes and to drive performance. All activities are supported by workflows and configurable notification rules to ensure that work is performed as intended.</p> <p>Exonaut is offered as both Software as a Service (cloud based) or as an installed solution.</p> <p>The Exonaut powered Consular Online 2.0 provides next-generation collaborative crisis management response. The tool has been used by the European External Action Service (EEAS) for consular crisis response and helped improve EU Member States collaborative response to consular crises. Exonaut Incident and Crisis Manager powers the EEAS's Consular Online 2.0 Tool. The mobile and web-based system includes real-time message boards</p>

	<p>and notifications, interactive geotagged maps of embassies, hospitals, assembly points, etc., as well as automated incident reports and custom dashboards.</p> <p>Very importantly, Exonaut offers an integrated trial and experimentation management system. Experimental criteria, questions sets and objectives can be mapped in the system to activities most suited to analysing the hypothesis or objective. Objective and subjective data against the criteria can then be assessed and recorded into the system in near real time and be available to inform the conduct of subsequent activities and/or generate user defined outputs.</p>
Keywords:	Crisis and emergency management; business continuity; exercise management
TRL (Technology readiness level)	TRL 9
Potential for EU conflict prevention and peacebuilding	The Exonaut software solutions have great potential for the EU's policy area of conflict prevention and peacebuilding, especially in terms of testing, validating and enhancing operational and mission concepts. The software suite has an experimentation module and has already been used by the EEAS for consular crisis response.

Gaming for peace (GAP) game

CD&E tool:	'Gaming for Peace' game
Company / organization:	Haunted Planet Studios Limited
Country:	Ireland
Link:	https://gap-project.eu/
Description:	<p>'Gaming for peace' is a multiple-player online role-playing visual novel game. It is a digital 2D serious game designed to train peace-keepers in conflict zones. The game has been developed under the EU-funded GAP (Gaming for Peace) project. It is an online role-playing game which could be used for training military, police and civilian peacekeepers in conflict zones. 'Gaming for Peace' is a new training tool with an inbuilt curriculum in soft skills for peacekeepers as well as an assessment of those skills. Players role-play as a member of another organisation, a different gender, ethnicity or nationality. The player is assessed before, during and after the game. They can see through the progress they are making, their improvement in communication, gender awareness and cultural awareness from playing the game. The game is playable in segments to allow for group discussion of the issues it addresses.</p> <p>The GAP game is a visual novel. A visual novel is a game in which narrative is the main focus. Most of a player's opportunities for interaction involve progressing the narrative in some way, either through choices made in dialogue or by interacting with objects in a scene that act as choice points within the game. A visual novel generally has multiple possible ways to progress through its storyline - these routes determined by the choices a player makes - and thus often has multiple endings to reflect these choices. The game is based on a narrative structure with no scenery changes within scenes. The progression of the game relies on the dialogue between characters, who are largely static, and the player.</p> <p>The GAP game aims to educate trainee peacekeepers to improve their cultural and gender awareness, as well as their communication skills. The game is both an innovative tool for delivering training and a new model in curriculum development as the base curriculum, informed by the state of the art in soft skills relevant for conflict prevention and peacebuilding missions. One of the strengths of the GAP game is that it has been aligned with International Human Rights Law.</p>
Keywords:	Gaming; peace
TRL (Technology readiness level)	TRL 7/8
Potential for EU conflict prevention and peacebuilding	The game has good potential for training EU mission / operational staff. The potential of this training game for experimentation of mission / operational concepts through peacebuilding scenarios has not been fully tapped.

Global Conflict Risk Index (GCRI)

CD&E tool:	Global Conflict Risk Index
Company / organization:	Joint Research Centre (JRC)
Country:	European Union
Link:	https://science4peace.jrc.ec.europa.eu/
Description:	<p>The Global Conflict Risk Index (GCRI) is a quantitative tool which forms the basis of the European Union's Early Warning System (EWS). GCRI expresses the statistical risk of violent conflict in a given country in the coming 1-4 years and is exclusively based on quantitative indicators from open sources. The development of the GCRI tool started in 2014 in order to provide an accessible, objective and open-source evidence base to support the EU's conflict prevention capacities and decision-making on long-term conflict risks. The output of the GCRI serves as the quantitative input to the EU conflict Early Warning System for identifying countries at high risk of conflict and those whose risk is worsening significantly.</p> <p>With the assumption that structural conditions in a country are linked to the occurrence of violent conflict, the GCRI collects 25 variables in 6 risk dimensions (political, security, social, economic, geographical / environmental, demographic) and uses statistical regression models to calculate the probability and intensity of violent conflict.</p> <p>Several model design decisions, including definition of the dependent variable, predictor variable selection, data imputation, and probability threshold definition, have been set in light of the model's direct application in the EU policy support on conflict prevention. While the GCRI remains firmly rooted by its conception and development in the European conflict prevention policy agenda, it is validated as a scientifically robust and rigorous method for a baseline quantitative evaluation of armed conflict risk.</p> <p>The main weakness of the tool is that the dynamical elements are not fully included in the model. It changes very slowly which decreases its utility for policy-making. Another weakness is the need to improve the link between early warning and early action.</p>
Keywords:	Conflict; risk; analysis
TRL (Technology readiness level)	TRL 7
Potential for EU conflict prevention and peacebuilding	<p>The GCRI has great potential for EU conflict prevention and peacebuilding, both at the strategic and operational level. The GCRI was developed in order to provide an accessible, objective and open-source evidence base to support decision-making on long-term conflict risks. At the strategic level the output of the GCRI serves as the starting point in the EU Conflict Early Warning System (EWS) for identifying countries at high risk of conflict. At the operational level GCRI could be used for defining the mission / operational concepts of EU peacebuilding missions and operations.</p>

Global Crisis Atlas

CD&E tool:	Global Crisis Atlas
Company / organization:	Joint Research Centre (JRC)
Country:	European Union
Link:	https://science4peace.jrc.ec.europa.eu/GCA/
Description:	<p>The Global Crisis Atlas is a scientific / technical facility in support of EU conflict prevention, crisis preparedness and response. The overall aim is to provide crisis/security monitoring and mapping products integrated in the Global Crisis Atlas portal, in order to provide the context to understand, monitor, anticipate, prevent and respond to situations of crisis or emerging crisis. It supports decision making on strategic, tactical and operational decision levels by providing:</p> <ul style="list-style-type: none"> • Background information for briefings • Situation assessment and monitoring • Crisis mapping • Other crisis or security relevant mapping • Monitoring of the Instrument contributing to Stability and Peace (IcSP) project implementation and planning <p>The Global Crisis Atlas is a catalogue of mapping products in crisis-stricken countries. It is accessible by means of a web interface where the user can search and query the products by country, region, date, tags, and category. The information platform allows access to mapping products to the European Commission, the European Parliament, the European External Action Service, the EU delegations and specific EU Member States entities. Given the sensitivity of the information contained on some of the maps, the access to the portal is protected through appropriate access privileges.</p>
Keywords:	Crisis, mapping
TRL (Technology readiness level)	TRL 7
Potential for EU conflict prevention and peacebuilding	The Global Crisis Atlas has great potential for EU conflict prevention and peacebuilding, both at the strategic and operational level. It could be used for strategic planning of the European Union's conflict prevention policies and for operational planning of concrete EU peacebuilding missions and operations.

KORA

CD&E tool:	KORA – Armed Forces Synthetic War Game and Crisis Response System
Company / organization:	IABG
Country:	Germany
Link:	https://www.iabg.de/fileadmin/media/Broschueren/DS/DS_KORA_de.pdf
Description:	<p>KORA is the leading German constructive simulation system for officers and staff officers training. It simulates all relevant aspects of land-, air- and sea-based operations of armed forces as well as disaster relief and crisis response operations and encompasses the entire scope of services within armed forces including connections to command and control systems. The main focus is training of staff organizations at the operational and all tactical levels. KORA is a core capability of simulation-assisted exercises for headquarters, component commands, brigade, battalion and task force command posts.</p> <p>KORA has a wide range of different sub-models from all areas of military operations, such as: combat model, artillery model, engineer model, helicopter model, air defence model, reconnaissance model (including air reconnaissance and common operational picture – COP), supply model, medical services model, communication model, disaster relief model, air force model, navy model, etc.</p> <p>KORA is an advanced synthetic wargaming environment. It is typically used in command post computer-assisted exercises (CAX) for headquarters at all command levels. It can also support scenario-based experiments which makes it suitable for concept development and experimentation (CD&E) purposed. KORA has been used in exercises for CD&E.</p> <p>KORA can be used as a stand-alone system or as a distributed multi-user system. Communication with other simulation systems is ensured by a standardised HLA evolved interface. This ensures a broad compatibility with other simulation systems and major simulation infrastructures. KORA has an open architecture providing maximum flexibility for extensions and connections to external systems.</p>
Keywords:	Constructive simulation, wargaming, crisis response, computer-assisted exercises (CAX)
TRL (Technology readiness level)	TRL 8/9
Potential for EU conflict prevention and peacebuilding	As a constructive simulation system KORA has a good potential for testing operational concepts in the area of EU conflict prevention and peacebuilding through scenario-based experiments.

MASA Sword

CD&E tool:	MASA SWORD (Simulated Wargaming for Operational Readiness and Doctrine)
Company / organization:	MASA Group
Country:	France
Link:	https://masasim.com/en/notre-metier/defense/
Description:	<p>MASA SWORD is a software suite, including a scenario generation tool, aggregated constructive simulation and analysis tools, dedicated to staff training, education, classroom teaching, planning support, analysis, operational research and command and control (C2) system simulation. SWORD can simulate operations from battalion to division level and is very suitable for training tactical level land staffs.</p> <p>MASA SWORD is a command training software and digital wargame with automated forces. It is being used by over 15 armies worldwide. It is primarily used for command post exercises but also for operations research.</p> <p>To provide maximum realism SWORD's constructive simulation is based on a behavioral and decision-making artificial intelligence (AI) technology developed by MASA Group. This technology, coupled with databases of equipment and materials, makes it possible to develop behaviours from numerous doctrines, thus allowing SWORD software to adapt very easily to the constraints and needs of different end-users. This capability means that large-scale exercises are conducted in a most realistic way, minimizing the combined operating costs and animation effort. Preparing military staff for action is made much more efficient by training in a realistic operational environment, with joint forces and allies, in a variety of different battlefield scenarios.</p> <p>The use of SWORD can also be extended for dual purposes and scenarios, including crisis management and counter-terrorism training. SWORD can immerse the command post staff in high-intensity conflicts, peacekeeping operations, counter-terrorism, or aid to populations in the event of natural or technological disasters. SWORD simulates all possible types of environment and allows trainees to lead the maneuver of thousands of autonomous, virtual subordinate units.</p>
Keywords:	Scenario generation, staff training, operational research, wargaming
TRL (Technology readiness level)	TRL 7
Potential for EU conflict prevention and peacebuilding	MASA SWORD has good potential for the EU's policy area of conflict prevention and peacebuilding in terms of testing and validating doctrines and operational concepts for EU peacebuilding missions and operations.

MASA Synergy

CD&E tool:	MASA Synergy
Company / organization:	MASA Group
Country:	France
Link:	https://masasim.com/en/
Description:	<p>MASA SYNERGY is a high-level decision-support system designed to help public and private organizations prepare their senior staff and officials to deal with emergencies, crises and disasters. MASA SYNERGY simulates multi-agency crisis scenarios through modelling public safety and civil defence operations at departmental, regional and state levels.</p> <p>Examples of SYNERGY models as follows:</p> <ul style="list-style-type: none"> • Natural disasters – earthquakes, floods, hurricanes, landslides, drought, etc. • Man-made disasters – chemical leaks, pollution, fires, etc. • Terrorist and organized crime attacks • Crowd control operations • Protection of strategic infrastructures • Security operations for large events <p>MASA SYNERGY is used to train and prepare crisis units and decision-makers, to support the preparation and testing of contingency and security plans, to support decision making, to analyse the impact of disasters on population, property and infrastructures.</p> <p>MASA SYNERGY helps to optimize resource planning and efficiency, manage disaster risk, ensure business continuity and preserve stock value.</p>
Keywords:	Decision support, emergencies and natural disasters
TRL (Technology readiness level)	TRL 7
Potential for EU conflict prevention and peacebuilding	The tool has limited potential for the EU's policy area of conflict prevention and peacebuilding, mostly in terms of playing disaster-management scenarios for EU peacebuilding missions and operations.

SitaWare

CD&E tool:	SitaWare
Company / organization:	Systematic
Country:	Denmark
Link:	https://systematic.com/en-gb/industries/defence/domains/land/sitaware-suite/
Description:	<p>The SitaWare suite is off-the-shelf open architecture software which provides advanced Command and Control (C2) and battle management capabilities, including interoperability that enables nations to exchange battlespace information with coalition partners.</p> <p>SitaWare Headquarters is an operationally proven C4 system which offers comprehensive and easy-to-use capabilities, combined with interoperability through support for modern military and civilian data exchange standards. With SitaWare Headquarters commanders gain comprehensive C2 and situational awareness across the battlespace.</p> <p>SitaWare Frontline provides comprehensive situational awareness, force tracking and tactical communications for frontline commanders operating in austere environments. Along with comprehensive situational awareness, SitaWare Frontline delivers a range of mission management and planning tools that give commanders an operational advantage. The software is constructed in two parts – a vehicle application and a user application.</p> <p>SitaWare Edge delivers comprehensive situational awareness and C2 for commanders operating at the tip of the spear. With an advanced mapping system that supports multiple map types in both 2D and 3D, commanders gain a clear understanding of their area of operations. Planning and geo tools, advanced force tracking, and integrated chat functionality provide an operational advantage. SitaWare Edge is Android-based software.</p> <p>The SitaWare C2 software system is a key component in a wide range of C2 systems. SitaWare can support communications on a low bandwidth, which is very important for tactical communications. SitaWare has been used extensively in military exercise. Very importantly, SitaWare has also been integrated with simulation systems such as MASA Sword and KORA. This provides a commercial off-the-shelf solution for C2 training, course of action analysis, wargaming and simulation support in concept and doctrine development.</p>
Keywords:	Command and control (C2), interoperability, situational awareness
TRL (Technology readiness level)	TRL 9
Potential for EU conflict prevention and peacebuilding	The SitaWare software system is very relevant for the conduct of exercises and experimentation with mission / operational concepts and scenarios for EU conflict prevention and peacebuilding, specifically in terms of command and control capabilities and interoperability.

XVR Simulation platform

CD&E tool:	XVR Simulation platform
Company / organization:	XVR Simulation
Country:	The Netherlands
Link:	https://www.xvrsim.com/en/platform/
Description:	<p>The XVR Simulation platform is a 3D games simulator, which represents a small 3D world up to a full region/country including the digital information (media) channels. In the XVR Simulation platform multiple players (students/participants) can be immersed in any type of incident/crisis scenario built and controlled by the instructor/operator. It is specifically designed to train and assess emergency response and rescue professionals. It is suitable for civil-military use but not for purely military tasks. Apart from training people, the simulation tool could be used for assessing the trained personnel, the procedures, the communication lines as well as assessing new tools.</p> <p>The XVR Simulation platform has several modules. The XVR On Scene module is designed to train operational and tactical level (bronze and silver) emergency responders. XVR On Scene provides the trainee with an interactive and immersive 3D view of the incident scenario. The scenario is completely adaptable to the local situation. XVR On Scene is a powerful tool to help trainees understand procedures by experience, lets them acquire practical knowledge in a relatively short time frame, practice decision-making skills, and have them experience situations that rarely occur in real life while in a safe environment.</p> <p>XVR Crisis Media is designed to train how to manage and monitor communication from both public and internal media sources in a crisis situation. Participants can vary from incident commanders to crisis teams and they are faced with a flow of information and communication injects through the simulation of actual media.</p> <p>XVR Resource Management is a module designed to train incident management and response resources. This module simulates the management of any large-scale incident using the actual amount of resources available. It enables to practise the logistical aspect of contingency plans across the entire emergency services chain.</p>
Keywords:	Simulation, emergency and incident response
TRL (Technology readiness level)	<p>The different modules of the XVR Simulation platform have TRLs, as follows:</p> <ul style="list-style-type: none"> XVR On scene module – TRL 9 XVR Crisis media – TRL 9 XVR Resource Management TRL 7/8 XVR Expo – TRL 9 XVR After Action Review – TRL 8

Potential for EU conflict prevention and peacebuilding	The simulation platform is relevant for EU peacebuilding, for example for experimenting and assessing procedures or commanding incident situations in a humanitarian intervention or a refugee camp. It could be used in a meaningful way for operational and tactical level exercises in the area of EU conflict prevention and peacebuilding.
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Conclusion

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 peacebuilding. The CD&E - related tools are very diverse: software tools, simulation systems and platforms, command and control systems, virtual environments, knowledge bases (indexes) and serious games. Only some of the tools (e.g., TNO ACE and to some extent KORA) have been developed specifically for CD&E purposes but all of the tools in practice could be used in the CD&E process. About half of the tools identified are simulation systems which potentially could be used for the experimentation of mission and operational concepts for EU conflict prevention and peacebuilding. Very importantly, some of the simulation systems have already been successfully integrated. The Datalab knowledge base and the Global Conflict Risk Index (GCRI) could potentially be used for scenario development in strategic-level exercises. Some of the tools, such as the 'Gaming for peace' game adequately address the gender aspects of EU peacebuilding. Overall, the tools identified are applicable to strategic and operational concepts in EU conflict prevention and peacebuilding but they are not tailor-made for this EU policy area. The development of a CD&E tool for this EU policy area requires considerable investment and the involvement of end-users from EU institutions. The research conducted for the catalogue is in some respects a survey of the marketplace from a CD&E perspective. It demonstrates that there is a market gap for a CD&E tool tailor-made for the EU's policy area of conflict prevention and peacebuilding. The CDE4Peace project will contribute in this respect by defining the requirements for an innovative CD&E tool tailored for this specific EU policy area (D5.1). Finally, it should be noted that achieving strategic autonomy of the EU is hardly possible unless the Union develops capabilities for concept development and experimentation in the area of conflict prevention and peacebuilding.

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