



Analysis

Analysis is required to support the entire life cycle of defence, homeland security, and critical infrastructure systems. Throughout the life cycle of a system, analysis is applied to a broad range of activities, including requirements definition and validation, concept development, system design, options analysis, bid evaluation, and mission-scenario planning.

CAE Professional Services provides user-centred, simulation-based analysis support to capability and operational planning, the acquisition cycle, systems engineering programs, and design and development teams. Our analysis support follows documented methodologies that engage the full range of stakeholders and investigate the impact of alternative concepts, designs, requirements, and decisions on human/system performance, training, and personnel.

In our laboratories, our team leverages modelling & simulation-enabled capability engineering and human factors engineering processes to analyze the system under test. Using constructive, virtual and/or live simulation, the problem set can be characterized and evaluated to provide support to the decision making process. Using this simulation-based analysis, stakeholders can visualize the impact of alternative designs and strategies and make better informed decisions, allowing them to “See the finish before you start”™.

Focus on the human

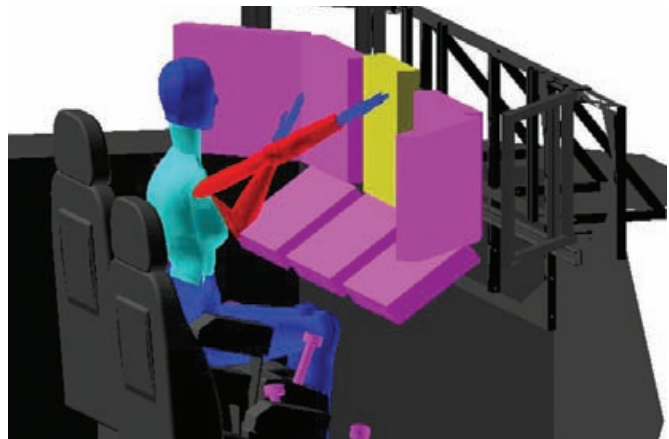
CAE Professional Services applies analytical methodologies that focus on the user community. Our team’s strength in human factors, human factors engineering, and human systems integration forms the foundation of our usercentred, simulation-based analysis approach for system and capability-level projects in the defence, homeland security, and critical infrastructure sectors.

At the system level, analysis systematically explores the mission, functions, goals, and tasks assigned to individuals and teams. This leads to the definition of design requirements and objective evaluation criteria for designing hardware and software components and procedures associated with human performance. Human systems integration ensures the inclusion of usercentred analysis throughout the design process, evaluating the impact of alternative designs on human performance, system safety, training, and personnel.

At the capability level, our Capability Engineering and Design Approach (CEDA™) supports the analysis of systems, processes, and organizations that comprise the capability. Operational roles, relationships, system interoperability, and information flow between operational assets are investigated to identify resource efficiencies, capability gaps and redundancies, and critical process breakdowns. At this level, the analysis of human performance, training and personnel is extended to accommodate the system-of-systems perspective. Our team analyzes the impact of alternative capability configurations on the strength and efficiency of organizational structures, the balance (or lack thereof) between responsibility, authority, and capability of individuals and teams, and the impact on organizational or force structure and individual career paths when studying system alternatives.

See the finish before you start™

Simulation is used in the analysis process to conduct iterative assessments of alternatives and to validate paper-based analysis. For system development, our methods employ modelling & simulation tools to analyze system-level performance, including the performance of crew members. Simulationbased analysis is conducted using both constructive and virtual simulation. Simulation affords project and capability planning teams a cost-effective environment to conduct experiments using multiple scenarios, quickly and easily changing parameters for the system, process, environment, and operator. Analysis can be conducted using human operators, human behaviour representations, or computer generated forces, or any combination of the three in distributed virtual or live simulations.





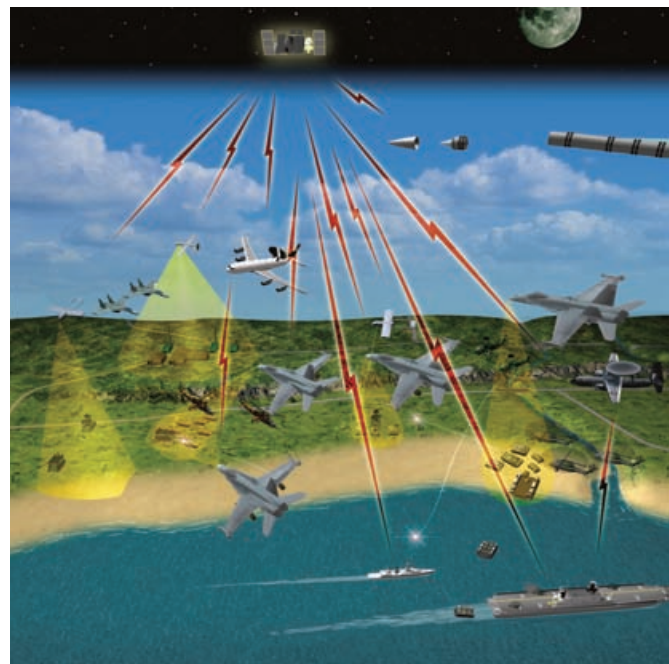
Capability analysis – Architectural frameworks

The cornerstone to our Capability Engineering and Design Approach (CEDA) is the development of architectural frameworks which apply our team's specific expertise in the definition and analysis of operational views of system-of-systems (extending standard DoD Architectural Framework procedures) in the defence and homeland security sectors. Using a suite of tools, subject matter expert and user inputs are captured to develop architectural analysis references. This data is used to establish UML models which may be further applied in other areas for simulation-based analysis.

Our library of architectural framework analysis from a wide range of projects in the defence and homeland security sectors provides an efficient reference tool for analyzing new challenges and demands to capability structures. Our depth of experience in the domestic security and C4ISR domains position our team as a leader in this field.

Program example – C4ISR campaign plan

CAE Professional Services was contracted by the Canadian Department of National Defence (DND) to develop a structured, efficient, and disciplined method of analyzing the C4ISR capability development strategy outlined in the C4ISR Campaign Plan. Using CAE Professional Services' Capability Engineering and Design Approach (CEDA), our team conducted an architectural framework analysis to identify the roles, responsibilities, and information flow of C4ISR operational assets. In addition, CAE Professional Services' Capability Engineering team developed an analysis framework for conducting capability 'gap' analysis that reviews and assesses existing capability-based planning scenarios and data models and provides a structure for future capability engineering-based analyses of C4ISR capability gaps for the development of an integrated command & control (C2) function. The study outcomes will be used by DND to revise the current C4ISR Campaign Plan and adjust capital acquisition projects and the capability portfolio.



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