

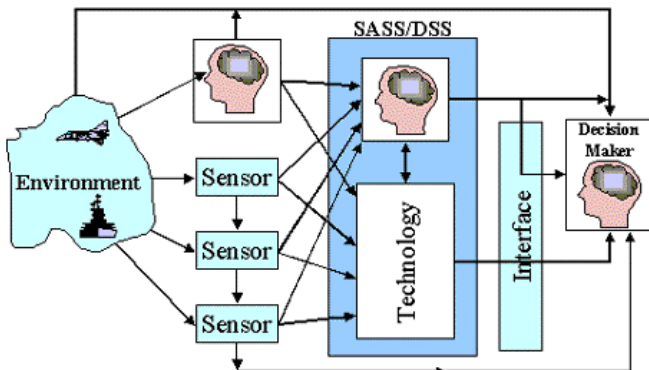


CODSI: Command Decision Support Interface

- An operational-like interface to link human factor and technological efforts
- A proof-of-concept tool having maximum flexibility with no a priori restriction
- A coordinated suite of functional/physical displays as "building blocks"

Situation analysis and decision making

Operational trends in warfare put the Situation Analysis (SA) and Decision Making (DM) processes under pressure. In Command and Control (C2) environments, a huge load of data and information is generated while the commanders require and process only a specific fraction of this information to acquire and maintain their Situation Awareness (SAW). Technological support is thus typically required to cope with the human limitations. This emphasizes the need for real-time, computer-based Situation Analysis and Decision Support Systems (SASSs and DSSs) to bridge the gap between the demands of the C2 task and the human limitations.



The SASS/DSS interface in a complex C2 environment

In a typical C2 environment, a technological interface often becomes the main link between the human and its environment. The decision-maker's SAW is thus highly related to the

quality of the interface. The ultimate goal of any display design is to positively impact the performance of the human-machine system of which it is a part. One of the main challenges of the interface is to strongly support the establishment of a cognitive fit between the SASS/DSS and the decision maker.

CODSI: Command Decision Support Interface

The Situation Analysis Support Systems (SASSs) Group at the DRDC Valcartier has developed an "operational-like" human-machine interface prototype called CODSI. It has been developed as a key component of the experimental environment used to efficiently study the enhancement of SAW quality in computer-based SA and command decision support systems for complex environments such as C2. The main objective with CODSI was not to develop and code "the solution" for a specific interface to a given SASS/DSS, but rather to develop "a tool", having maximum flexibility and with no a priori restriction, to investigate such potential solutions. The intent was to supply an appropriate proof-of-concept test environment to:

- demonstrate and evaluate display concepts derived from cognitive theories and developed from a technological perspective;
- link the effort of the human factors specialists and technological system designers;
- identify which information made available by the technology is required by the decision-maker ;
- study and evaluate human-computer interaction concepts for SA and define the best presentation format compatible with human information processing;
- evaluate the appropriate time to present the information;
- support methodologies for SAW measurement;
- demonstrate the enhancement of SAW by computer-based situation analysis and decision-making support systems.

CODSI: Command Decision Support Interface

A suite of functional/physical displays

Maximum flexibility was essential for CODSI in order to provide the high potential of adaptation (e.g., rapid programming of the necessary changes) required by the testing of new interface concepts and technologies. To attain this level of flexibility, it has been decided to develop CODSI as a coordinated suite of functional (e.g., threat evaluation) and physical (e.g., geographical) displays. Each such display can be seen as a building block (implementing a particular interface capability deemed useful for decision support) that can be used in conjunction with other building blocks to achieve the necessary overall interface capability.

CODSI to validate decision support systems

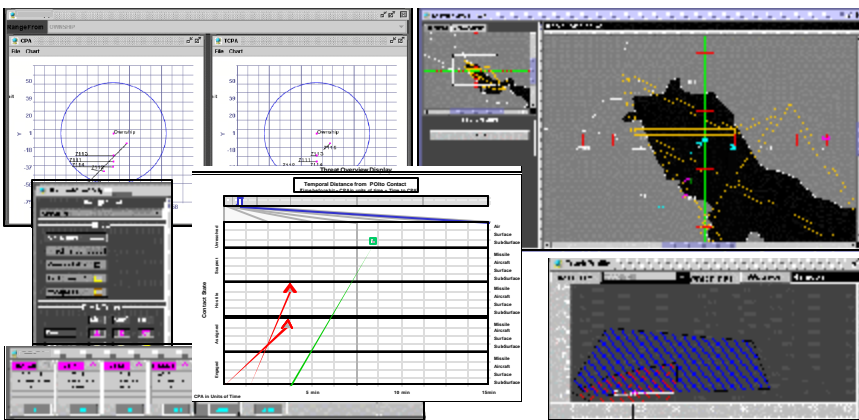
Following the identification of problems, deficiencies and user needs, a new DSS is developed and introduced in the decision-makers' environment. The introduction of this DSS may change the overall dynamic between the C2 task, the human and the system. With this new dynamic, different operational problems may be encountered leading to a decrease of the human performance. CODSI is an ideal environment to validate such DSSs from both the operational and the human performance perspectives. CODSI offers an experimental environment with high levels of realism and control over the variables of interest. Thus, experimental results with a great level of validity are obtained, that can then be generalized to real situations.

CODSI and SEATS for SAW measurement

Progress in SA largely depends on the development of a solid body of conceptual and methodological knowledge on how to measure it. The systematic assessment of SA and SAW is a necessary precursor to developing theories of SA, exploring factors related to individual differences in SAW, the evaluation of system designs and new training techniques whose purpose is to improve SAW, and a myriad of related issues. CODSI can be used to empirically study human SA performance in a technological environment since it is developed in the framework of a highly modular, structured and flexible test bed, called SEATS (Simulation Environment for the Analysis of the Tactical Situation), developed by DRDC Valcartier as a proof-of-concept demonstrator to achieve the continuing exploration of Information Fusion (IF) and SA concepts. Combined with SEATS, CODSI offers an appropriate setting to study and measure SAW and DM that can be seen as a good compromise between a laboratory settings and field trials.

Technical description

CODSI is currently developed in Java. It may therefore be run under any platform supporting the "java 2" virtual machine. It uses the loox java libraries "jLoox" and "jLooxGIS" to help manage and display graphical components. CODSI uses "CORBA" to poll from a "CORBA server" string messages containing XML formatted information.



CODSI: A coordinated suite of functional/physical displays as "building blocks"

For more information

Project Leader

Phone: (418) 844-4000 ext.: 4753 Fax: (418) 844-4538

Email: collabo-valcartier@drdc-rddc.gc.ca

Defence R&D Canada – Valcartier

2459 Pie-XI Blvd North, Val-Bélair, Quebec G3J 1X5

Phone: (418) 844-4000 Fax: (418) 844-4635

collabo-valcartier@drdc-rddc.gc.ca

www.valcartier.drdc-rddc.gc.ca

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