# Focus on CSIR services in
## Cognitive Work Analysis



**Cognitive Work Analysis (CWA) is a systems-based approach to develop formative designs for decision support systems. It considers the ecological constraints that may shape the execution of tasks as well as the cognitive approaches of the users of the system. CWA assists in the analysis, design and evaluation of large-scale and dynamic socio-technical systems where people can and have to adapt to changes in a complex environment. The ecological constraints still allow for a variety of work patterns to solve unexpected problems and situations, resulting in a flexible decision support system.**

CWA focuses on how work can be done and is used to develop Human Machine Interfaces (HMI) to support human sense making and decision making. A HMI should intuitively fit in with how human cognitive processes are performed. It affords workers the ability to solve unanticipated events through creativity and innovativeness. This enables operators to know what can be expected as well as being flexible in responses. This ability of being flexible helps reducing the cost of the SE process through streamlining and limited redesign cycles. CWA consists of five modelling techniques, they are following:

a) **Work Domain Analysis.** The Work Domain Analysis models the event independent purpose, functional and physical constraints of the system under investigation.

b) **Control Task Analysis.** The focus of the Control Task Analysis is to identify the tasks required to fulfil its functions and objectives through a context analysis and decision ladder.

c) **Strategies analysis.** The strategies used to execute the control tasks are analysed to identify the cognitive resources required for situation assessment and decision making.

d) **Socio-Organisation Analysis.** The Socio-Organisation Analysis identifies the distribution of tasks throughout an organisation to characterise interactions and flow of information.

e) **Worker Competency Analysis.** The constraint of the human worker is analysed to identify the levels of automation required in the sociotechnical system.



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**Complex Environment**

Social Transaction Analysis

Process — **Doctrine** — People

Control Task Analysis

Architecture

Work Domain Analysis

Strategies Analysis

HMI

Worker Competency Analysis

**Sociotechnical System**

Physical System (Hardware, Software, Facilities)
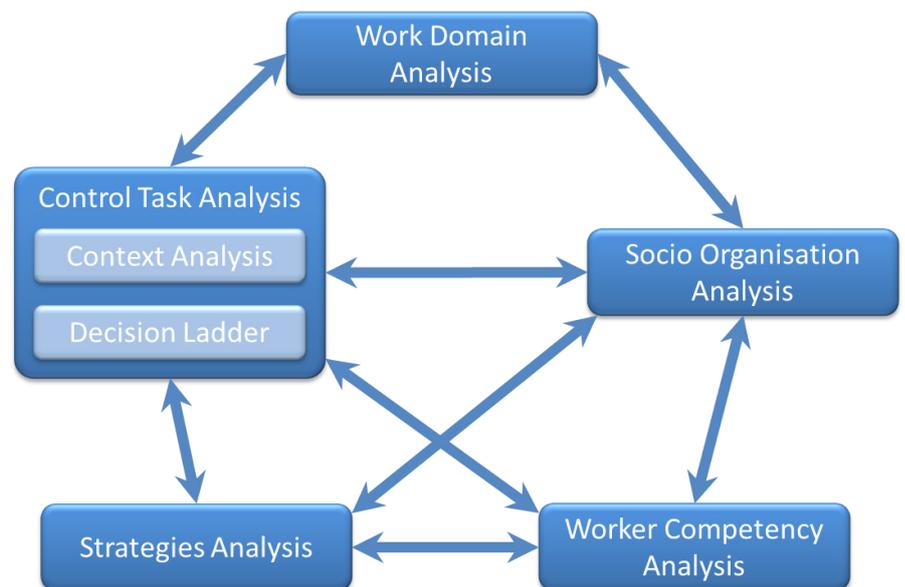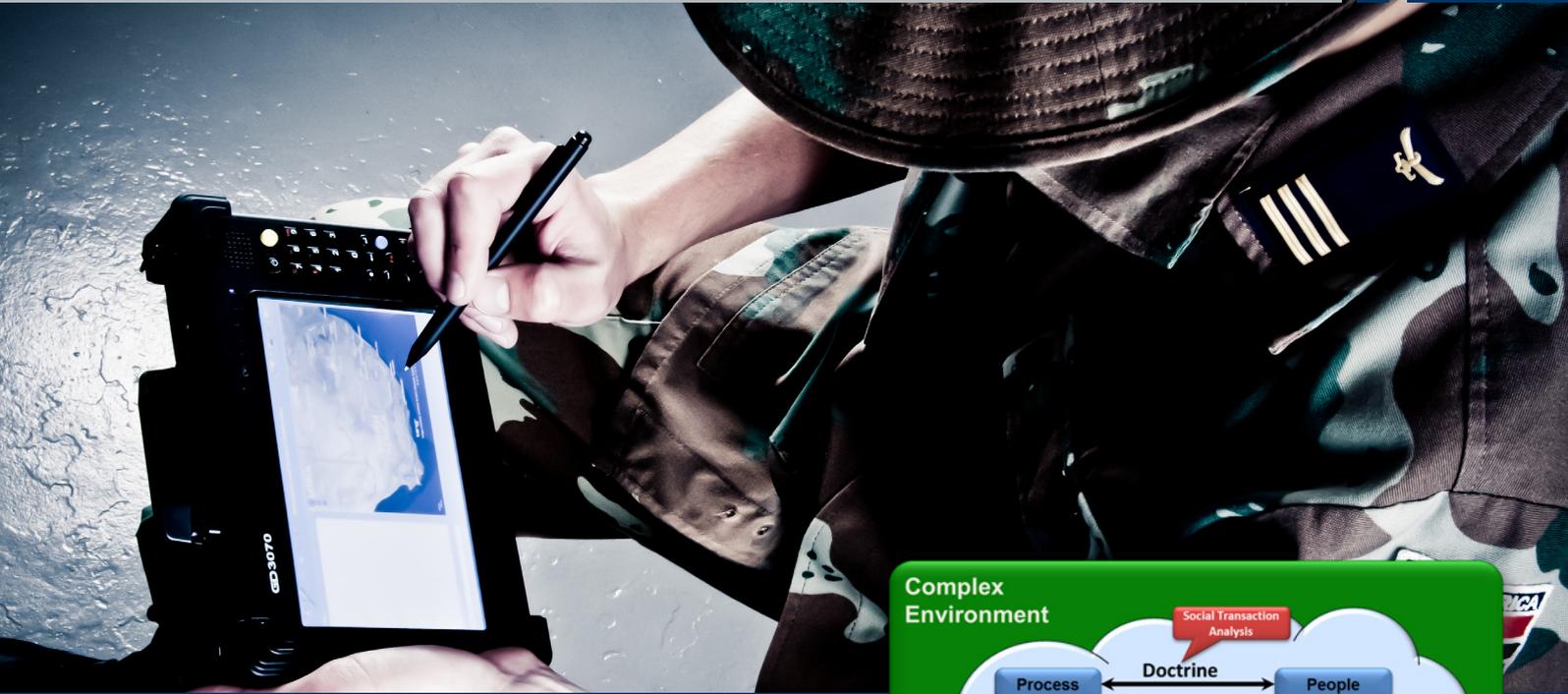
The output of the CWA is a number of models to guide the identification of requirements for a sociotechnical system. These requirements are used to identify the requirements for an ecological interface that supports the human within the constraints of the real world problems to perform his tasks. As seen in the following picture, the typical CWA framework address all the aspects within a complex sociotechnical system, such as Command and Control.
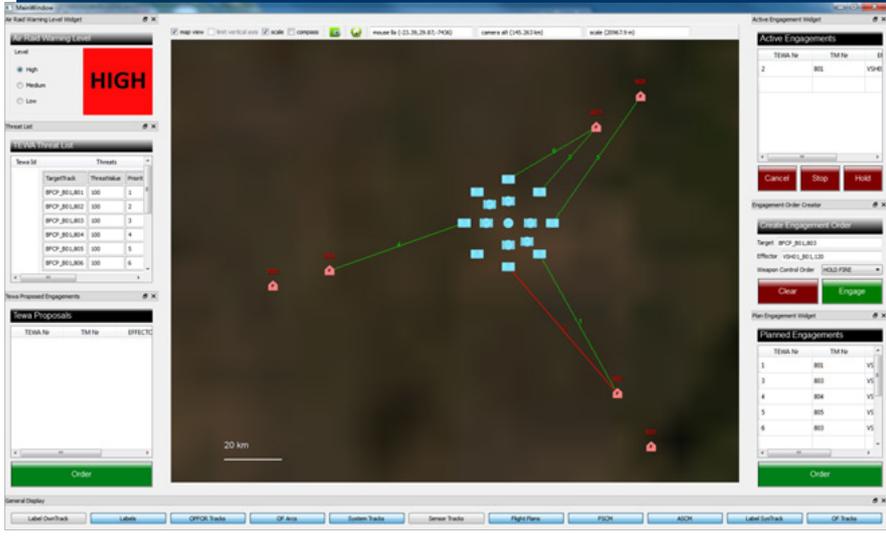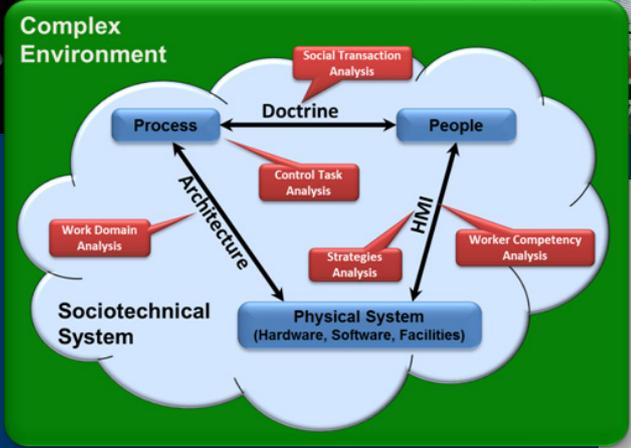


This process is executed to develop interface (HMI) requirements for a ground based air defence C2 system. The prototype HMI can be used in exercises to assess doctrine and communication system concepts.

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