# COP Application: Dangers and Guidelines

Olivier de PEUFEILHOUX
EADS Defense and Security Systems
6 rue Dewoitine
BP14 78142 VELIZY VILLACOUBLAY CEDEX
FRANCE

Olivier.de-peufeilhoux@sysde.eads.net

ABSTRACT

Based on the experience of several years in development of C3I systems at joint and tactical levels in many countries, the paper presents the main dangers to avoid and some guidelines to follow for the design of Common Operational Picture application.
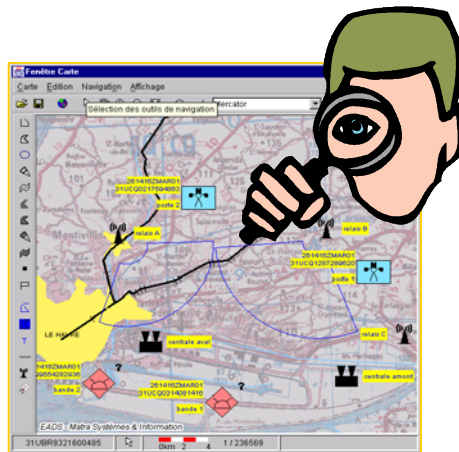
1.   COP GOAL

The goal of Common Operational Picture is not only to allow the sharing of a common view of the situation among the decision makers, but it is, above all, to help them to make the right decision while providing the right information at the right time at the right place.

Thus, the C3I serves the commander but not the contrary.

2.   DANGERS

The design of a COP application must avoid two dangers:

- Excessive modelling,
- Insufficient modelling.

2.1   Some Excessive Modelling Dangers

It is not possible to build a formal modelling for all the data able to be taken into account in decision process of a commander.

If it is easy to standardize the description of all elementary physical phenomena (location, time, amount), the way to synthesise these elementary information's, into few decision enabled ones, is not so easy (for instance: operational availability status of a unit).

The modelling of intentions and behaviours is too complicated and too uncertain to be used in C3I systems, in spite of their major roles in command process.

The measured and the true importance of one information may be different. Some small details could have strategic interest but automatic computation of synthesis may erase relevance.

2.2   Insufficient Modelling Dangers

The simple use of COTS products (office tools) to manage and exchange operational information, combined with linguistic diversity within a multinational coalition headquarters, leads to informational anarchy:

- Redundant information's,
- Inconsistent information's,
- Unqualified information's.

There is a major risk of decisional hegemony if the only response to this diversity is the standardisation of all technical solutions and procedures towards a unique system.

3.   GUIDELINES FOR COP APPLICATION DEVELOPMENT

A fully theoretical approach is quite sterile and may lead to dead end, after numerous and tiring discussions about such bla-bla sentences "The COP may be considered as a set of data, organised into a library of information's covering all area of knowledge useful to …."

So a pragmatic approach, based on true experiences and leading to concrete guidelines, is the only one able to improve COP application in C3I systems.

It could be profitable to study and to experiment similar processes and applications used in civil world (stock exchange dashboard, executive managers dashboard, ...).

Concrete guidelines may be identified for each area of C3I design:

- The data: right level modelling
- The functions: right complexity of algorithms
- The architecture: key design items

3.1   Right Level of Data Modelling

Main guidelines are:

- Separate, within object description, the part able to be formalised (type, location, time, amount, …) and the part not able to be (intention, behaviour, …).

- Reuse, for formal description, experienced data model like LC2IEDM (from ATCCIS), based on "5W approach":
    - Who (object identity)
    - What (object type)
    - Where (location)
    - When (time)
    - Why (context)
- Complete formal description by simple text (comments) and/or links to office files (documents, pictures, …).
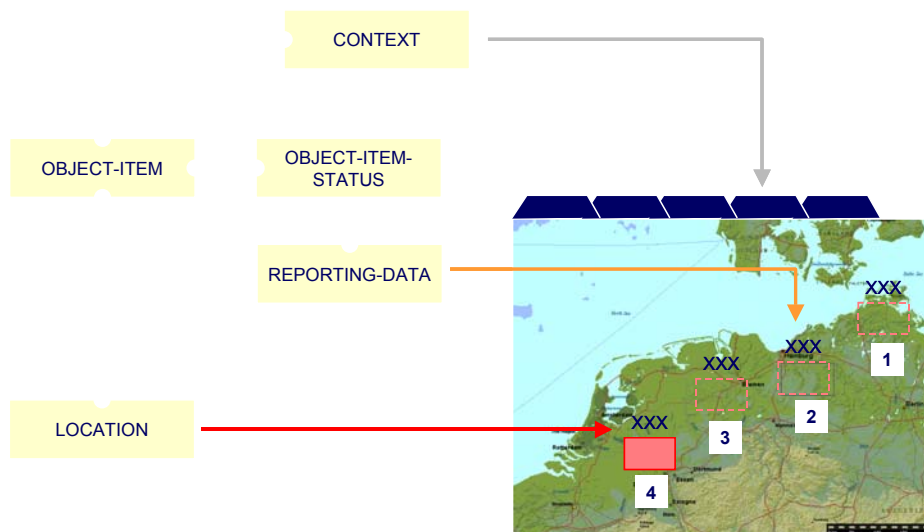
3.2   Right Complexity of Functions

Main guidelines for information access functions are:

- Separate common "validated" documents (current situation) and personal documents (reports, forecasts, …),
- Combine use of RDBMS requests on formal description and use of a common request engine for informal description.

Main guidelines for information presentation functions are:

- Allow simultaneous and independent viewpoints on the same information:
    - geographical viewpoint: icons on a map,
    - organisational viewpoint: hierarchical tree,
    - chronological viewpoint: bars on a timescale,
    - technical viewpoint: bars on a histogram.
- Give access from operational presentation to all complementary information's.

Main guidelines for decision help functions are:

- Stay "modest" for algorithms,
- Prefer highlighting of relevant information than automatic filtering of irrelevant ones.

3.3   Architecture

Main guidelines for architecture are:

- Concurrent design on three levels: database, tools, user,

- Generalize distributed architecture model with:
  - Low level of coupling between different tools,
  - Independence from database schema,
  - Consistent "Services approach" at user level