Mission Design: Fitting the Solution to the Problem

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Artifacts

- are **man-made** tools, that are used to
- reach **goals**, but that are
- **not always objects**

- A **C2 system** and a (**military**) **mission** are both artifacts
The logic of Design

(Brehmer)
The artifact as an interface

Inner system

Artifact

Outer system
Successful application requires:
- necessary functionality
- adequate user interface
- skillful user
the interface of C2

C2 cell or C2 system with user(s)

Order

Subordinate units
The interface of a mission

- Own units
- Environment containing trouble makers
- Actions
The logic of design

Purpose → Why?

Functions → What?

Form → How?

(Brehmer)
The abstraction hierarchy

<table>
<thead>
<tr>
<th>Functional Purposes</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Values and Priority Measures</td>
<td>...</td>
</tr>
<tr>
<td>Purpose-related Functions</td>
<td>Functions</td>
</tr>
<tr>
<td>Object-related Processes</td>
<td></td>
</tr>
<tr>
<td>Physical Objects</td>
<td>Form</td>
</tr>
</tbody>
</table>

(Rasmussen)
Functional purposes

Goals and constraints

- (Rasmussen, Pejtersen, and Goodstein, 1994)

Primary objectives

Secondary objectives

Constraints by inner system

Constraints by outer system

(Naikar, Hopcroft, and Moylan)
Values and priority measures

Realism enters

How to measure performance

What resources are needed

Sort out priorities
Requirements analysis

Purpose

Value

Function

Value

Function

Value

Function

Design
Object-related processes

The activities performed by the system

What can be done

How the functions are fulfilled (if they are)

Redundancy for flexibility
Physical objects

All components of the system that contribute to the processes

including personnel and instructions
The C2 system and the mission system

The DOODA loop (Brehmer)
Concept of Operation

Sensemaking

Data Collection

Data

Order

Planning

Direction

Coordination

products in mission design
Mind the mind of the other
Theory and design of C2 systems

C2 Theory

- Purpose
- Functions

Design

- Form

Why?
What?
How?

(Brehmer)
Demands on a theory of C2

Constraint → Input → Function → Purpose → Output → (Values)
Mission

Own resources

Actions

Opponent

Order

C2
Thank you for your attention!

Questions or Comments?