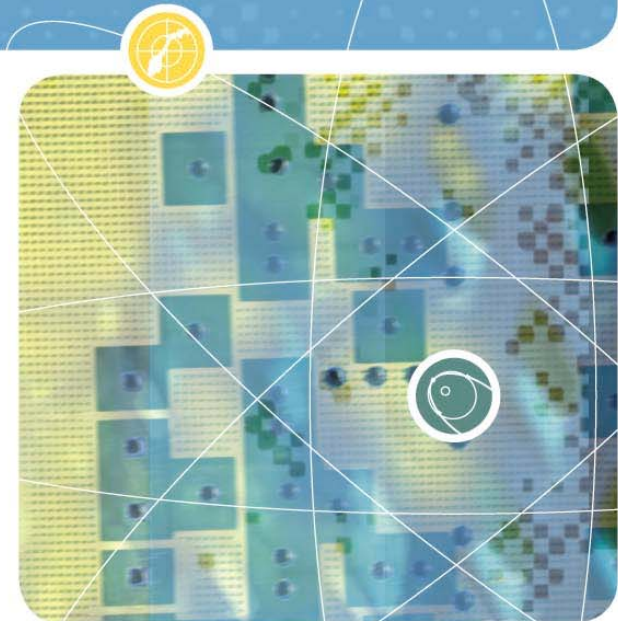


Guiding Experimentation Efforts in Support of Transformation



Chief Scientist Johan Aas, FFI

Dr Trond Bergene, Teleplan AS





Transformation and CD&E

CD&E

- Concept Development and Experimentation (CD&E) is paramount to the success of transformation efforts.
- Top-down initiatives: Generation of CD&E activities based on identification of capability gaps.
- Bottom-up initiatives (shortfalls and “good ideas”): Generation of CD&E activities from communities concerned with e.g. operations, R&D or training.
- Prioritization of proposed experiments is essential.

CD&E in Norway

- The Joint Operational Headquarter in Norway is responsible for coordinating all national operationally related CD&E
 - This differs from some other countries, where dedicated centers have been given the responsibility for CD&E.

METEX (METHod for EXperimentation): The framework is currently under final development and evaluation by the Norwegian Defence Research Establishment (FFI) and Teleplan AS.



Presentation Outline

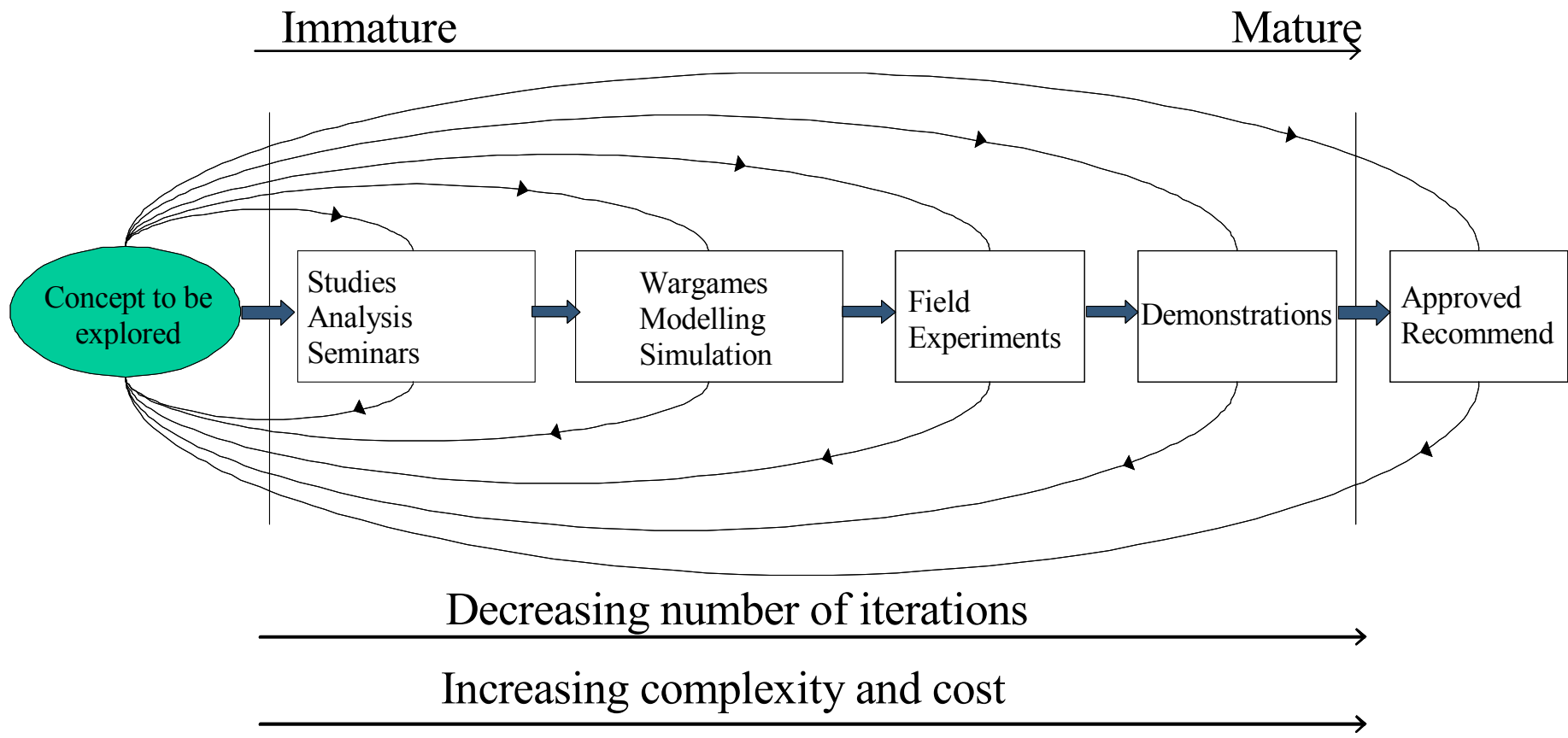
- The CD&E Process.
- A framework and a decision support tool for prioritizing experimental activities.
- A Web-based process framework guiding prioritization of CD&E activities.



The CD&E Process



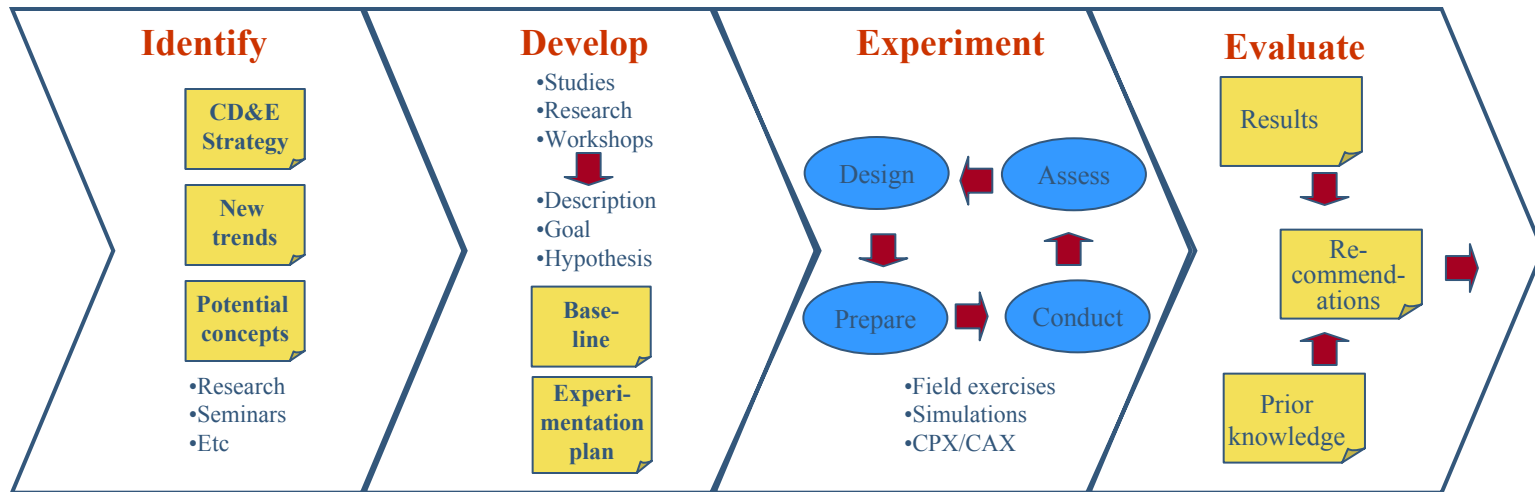
Tools Supporting Maturation and Development of Concepts*



* Based on ideas from UK Command and Battlespace Management and Canadian Forces Experimentation Centre (Plan Pegasus).

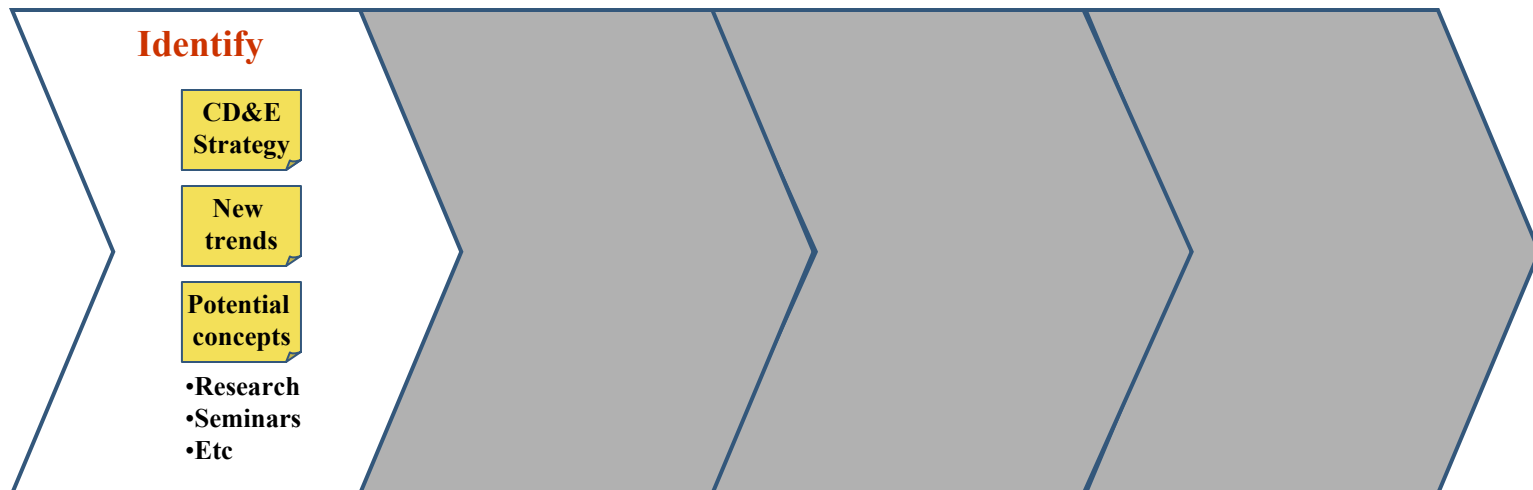
The CD&E Process

The CD&E process is divided into 4 sub-processes:



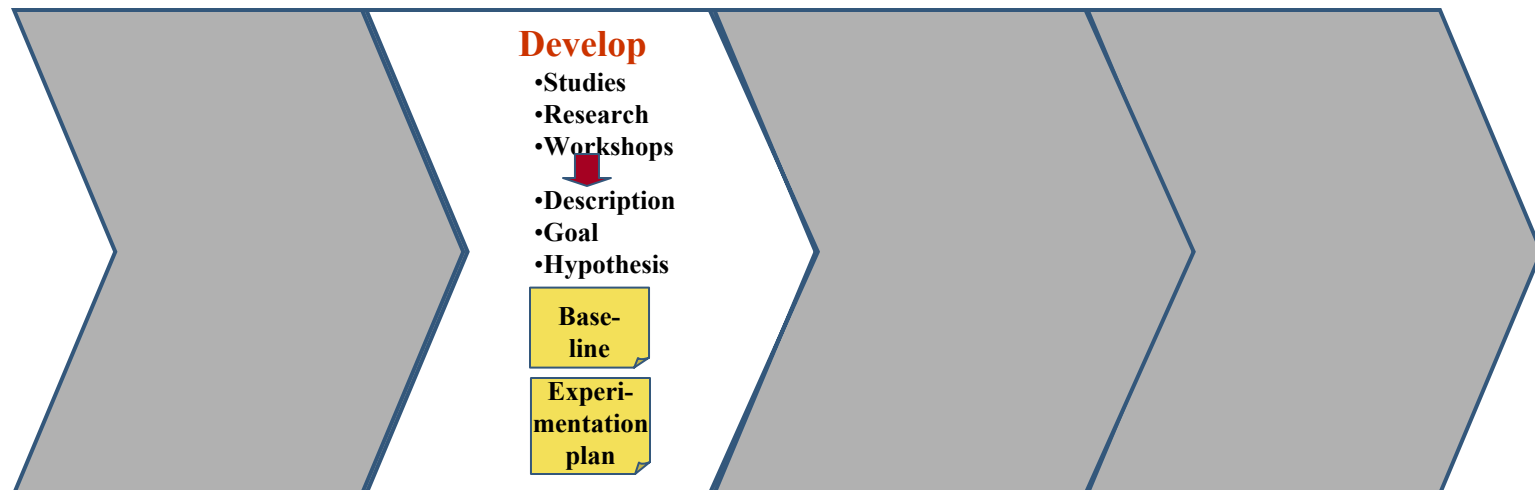


The CD&E Process: *Identify*

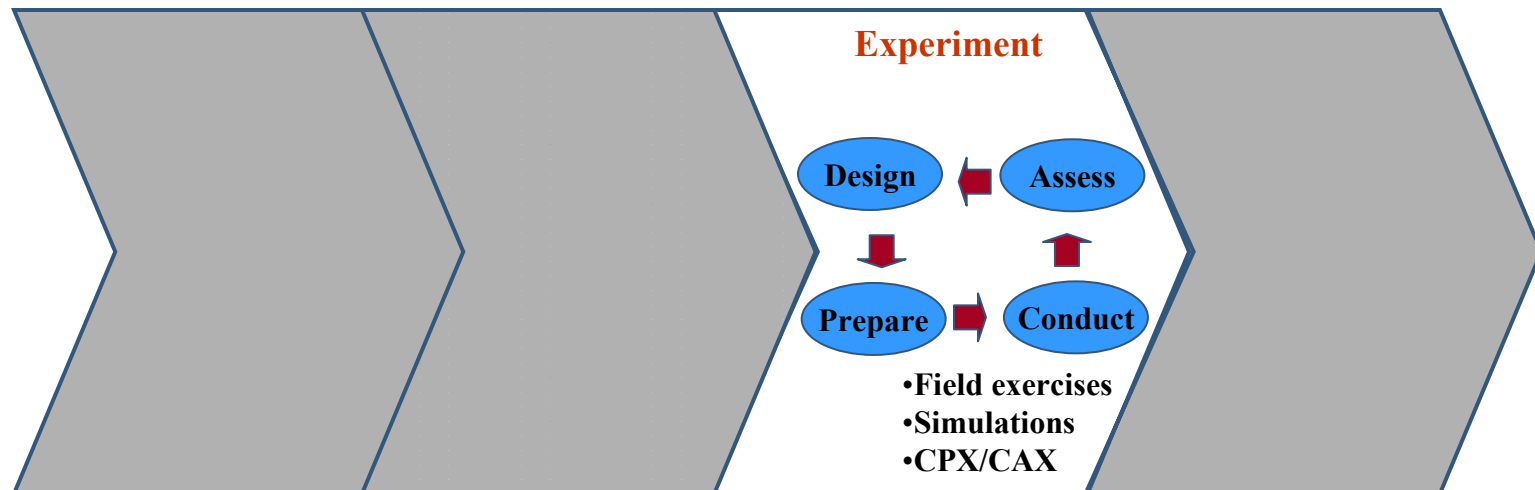




The CD&E Process: *Develop*

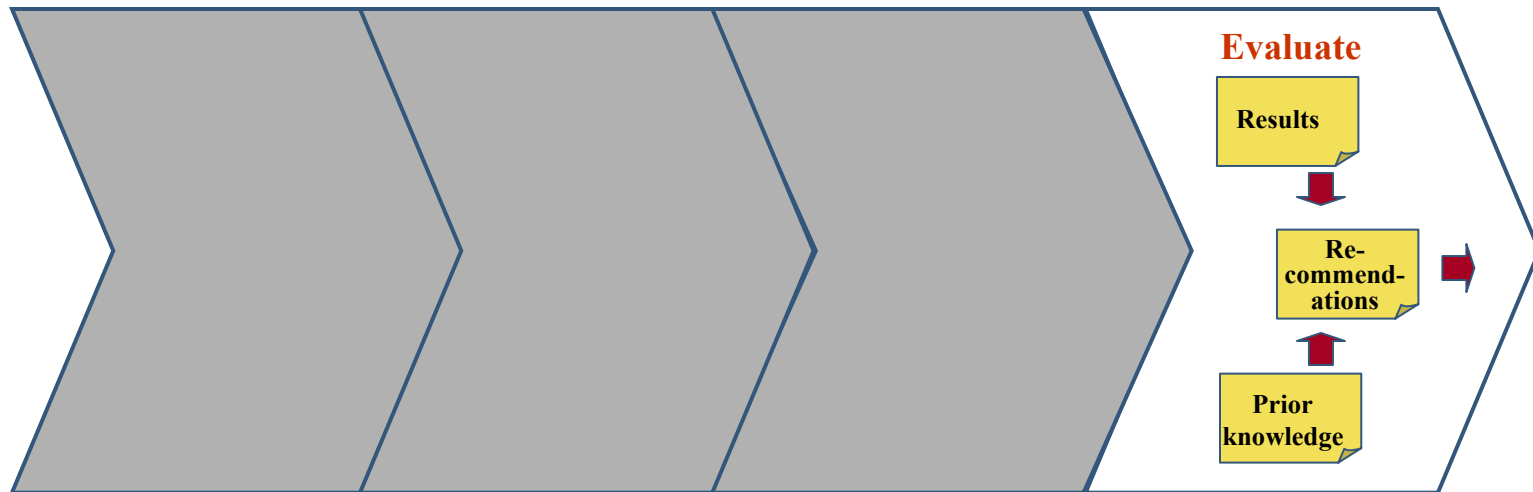


The CD&E Process: *Experiment*

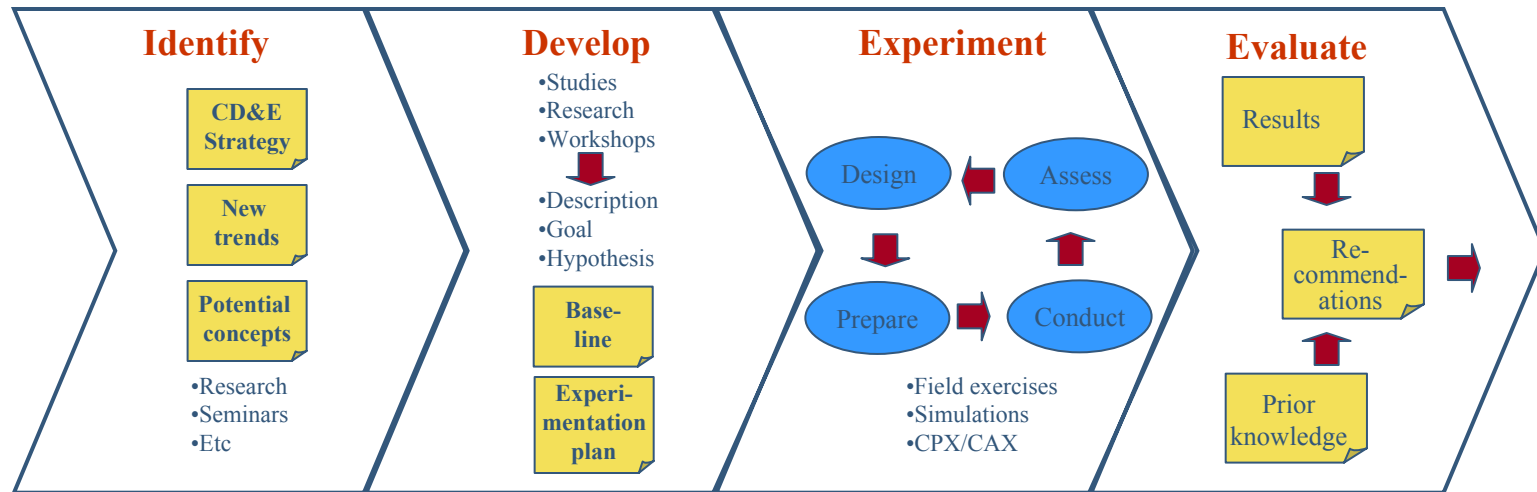


*: US DoD Command and Control Research Program – Code of Best Practice for Experimentation.

The CD&E Process: *Evaluate*



The CD&E Process



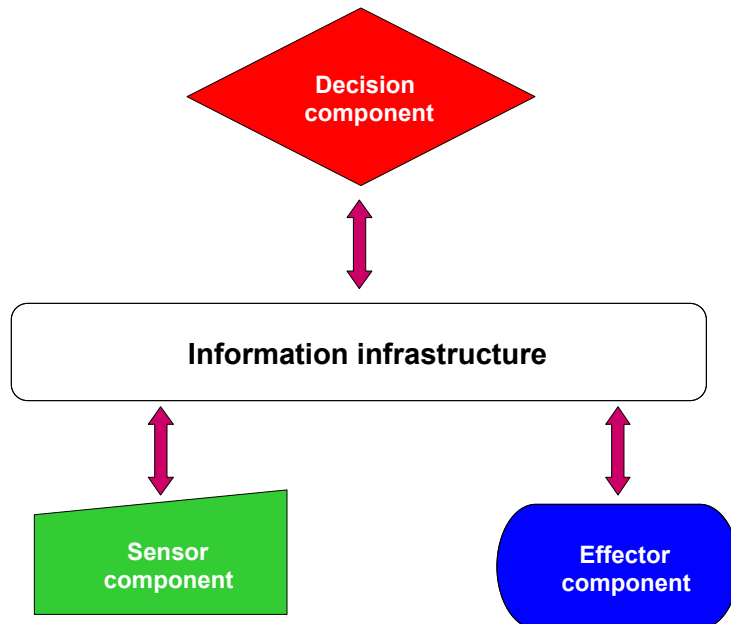
FFI



A framework and a decision support tool for prioritization of experimental activities

Network Centric Component Model (NCCM)

- The NCCM has been developed in connection with the recent national Defense Requirement Review:

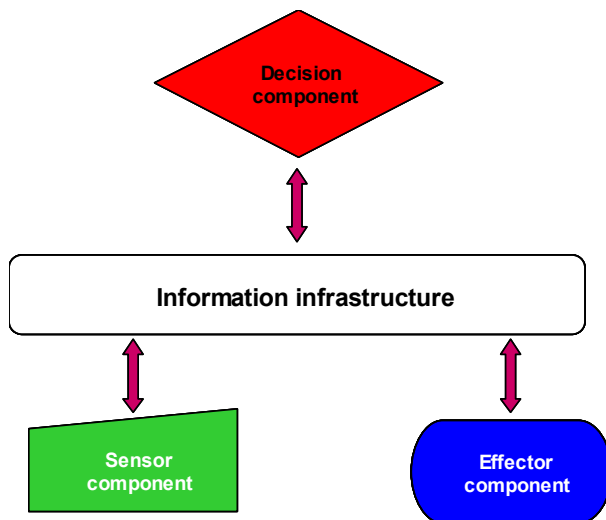


- A decision component, which consists of decision support and “decision-making” and which deliver decisions.
- A sensor component, which delivers data and information from sensors.
- An effector component, which delivers “effects” in operations.
- An information infrastructure (INI), which delivers connectivity and distribution capacity for data and information.



Components Properties(1)

Properties are used to characterize NCCM components.



Common properties (for all components)

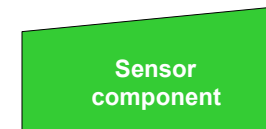
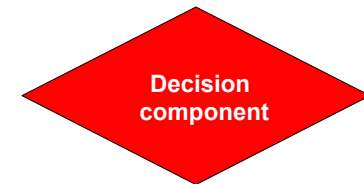
- *Robustness*
- *Interoperability*
- *Speed and flexibility*
- *Responsiveness and strategic deployability*



Components Properties (2)

Component specific properties

- *Decision effectiveness* for the decision component
- *Coverage and data quality* for the sensor component
- *Effect* for the effector component
- *Connectivity and distribution capacity* for the INI





Gaps in the Force Structure Based on Components and Properties

Decision component	Component specific properties			Common properties			
	Decision effectiveness			Robustness	Inter-operability	Speed and flexibility	Responsiveness and strategic deployability
	Establish situational picture (T)	Knowledge and experience	Culture				
Operational level	2	1	3	2	3	3	2
Tactical level	2	3	1	3	3	1	2
Sensor component	Coverage and data quality						
Psyops	2			3	3	1	1
CNO	2			3	2	3	3
EW	1			2	2	1	2
Land	2			2	3	3	1
Surface	2			2	1	2	1
Sub sea	1			2	1	2	1
Air	2			3	1	2	2
Space	1			2	2	1	3
Effector component	Effect						
Psyops	2			2	2	1	3
CNO	1			3	3	2	3
EW	3			3	2	2	1
Land	2			2	2	2	2
Surface	2			2	2	2	2
Sub sea	1			2	3	2	2
Air	1			1	2	1	2
Space	3			3	3	1	2
Information infrastructure, INI	Connectivity and distribution capacity						
INI	2			1	3	2	2

- Red: Critical gaps
 - Yellow: Substantial gaps
 - Green: Satisfactory status.
- The colors are given by the current situation.



Assessing the Operational Value of a Concept

Decision Component	Component specific properties						Common properties								Score
	Decision effectiveness						Robustness	Interoperability	Speed and flexibility	Responsiveness and strategic deployability	Cost-/ Effectiveness				
	Establish situational picture		Knowledge and experience		Culture										
Significance	3		3		3		3		3		3		3		
	Status	Score	Status	Score	Status	Score	Status	Score	Status	Score	Status	Score	Status	Score	
Operational level	2		1		3		2		3		3		2		0
Tactical level	2		3		1		3		3		1		2		0
Sensor component	Coverage and data quality						Status	Score	Status	Score	Status	Score	Status	Score	Score
Significance	3			3											
	Status			Score											
Psyops	2						3		3		1		1		0
CNO	2						3		2		3		3		0
EW	1						2		2		1		2		0
Land	2			3			2		3	2	3	2	1		54
Surface - Sea	2			2			2		1	2	2	2	1		30
Subsea	1						2		1		2		1		0
Air	2						3		1		2		2		0
Space	1						2		2		1		3		0
Effector component	Virkning						Status	Score	Status	Score	Status	Score	Status	Score	Score
Significance	3			3											
	Status			Score											
Psyops	2						2		2		1		3		0
CNO	1						3		3		2		3		0
EW	3						3		2		2		1		0
Land	2						2		2		2		2		0
Surface - Sea	2						2		2		2		2		0
Subsea	1						2		3		2		2		0
Air	1						1		2		1		2		0
Space	0						0		0		0		0		0
Information Infrastructure (INI)	Connectivity and distribution capacity						Status	Score	Status	Score	Status	Score	Status	Score	Score
Significance	3			3											
	Status			Score											
INI	2						1		3		2		2		0

Total score 84



Decision Support Tool Modules

- The tool consists of four modules supporting each of the following tasks:
 - Assessing the operational value (benefit) of the experiment.
 - Calculating the costs of the experiment.
 - Calculating the benefit/cost ratio of the experiment.
 - Assessing the uncertainties associated with conducting the experiment.
- Going through the tasks for each experiment in a portfolio of experiments will give a basis for prioritization of which experiments to conduct (fund).

FFI



A Web-based Process Framework Guiding Prioritization of CD&E Activities



METEX Web Front Page

METEX
(Start page)

Strategic document for CD & E

Identify → Develop → Experiment → Evaluate

Assessment model

CD&E:
-Governing documents
-METEX CD&E intro (ppt)
-Terms and definitions

MFU03:
-Concept for network enabled use of military power
-Command concept in NCW
-Final report DP2 and 3 - NCW study (ppt)

Links:
-International links

SUPPORTING DOCS

- 01 Identify
- 02 Develop
- 03 Experiment
- 04 Evaluate

Assessment model

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METEX Web

Concept Development and Experimentation

05. October 2003
Do you have ideas for improvement? Send to [Webmaster](#)

Do you need a quick intro to METEX Web? [Click here](#)

METEX news:

5-6 November 03
Project METEX exhibits at NATO CD&E conference in Prague

05. October 03
First draft version of the METEX process released on Web.

Local intranet

Sub-Processes are Accessed by Point-and-Click



The screenshot shows a web browser window with the following content:

- Browser Title:** \\TPN-FILE\Project\DPC\03001-DPC-METEX\C) Configuration units\METEX WEB\METEX Web 2003-10-07(EN - Micr...
- Address Bar:** \\TPN-FILE\Project\DPC\03001-DPC-METEX\C) Configuration units\METEX WEB\METEX Web 2003-10-07(EN)\Index.htm
- Navigation:** Back, Forward, Stop, Home, Search, Favorites, Media, Mail, Print, TV, Home, Links.
- Logo:** METEX logo with a red shield and crown.
- Process Flow:** Identify → **Develop** → Experiment → Evaluate. Above 'Develop' is 'Strategic document for CD & E'. Below the flow is 'Assessment model'.
- Left Sidebar:**
 - CD&E:**
 - Governing documents
 - METEX CD&E intro (ppt)
 - Terms and definitions
 - MFU03:**
 - Concept for network enabled use of military power
 - Command concept in NCW
 - Final report DP2 and 3 - NCW study (ppt)
 - SUPPORTING DOCS:**
 - 01 Identify
 - 02 Develop
 - 03 Experiment
 - 04 Evaluate
 - Assessment model
- Footer:** © Webdesign Teleplan AS
- System Tray:** Local intranet

Develop

2-1 Qualify idea

2-2 Prioritize experiment

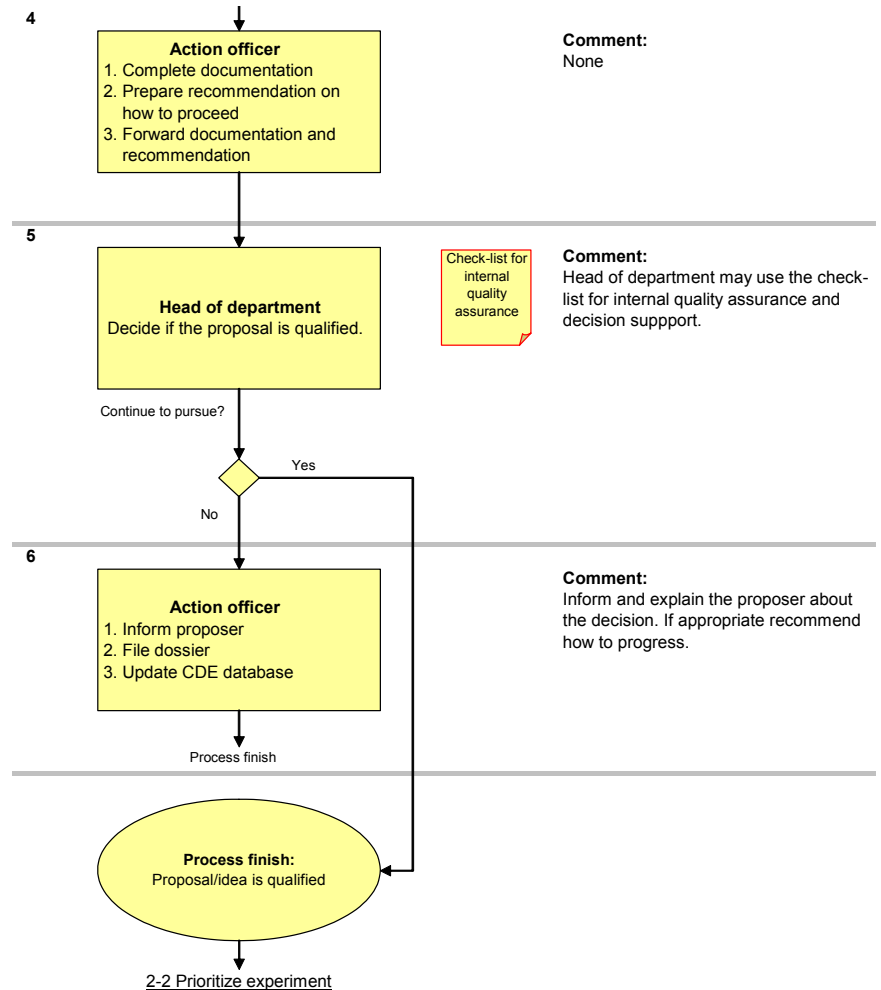
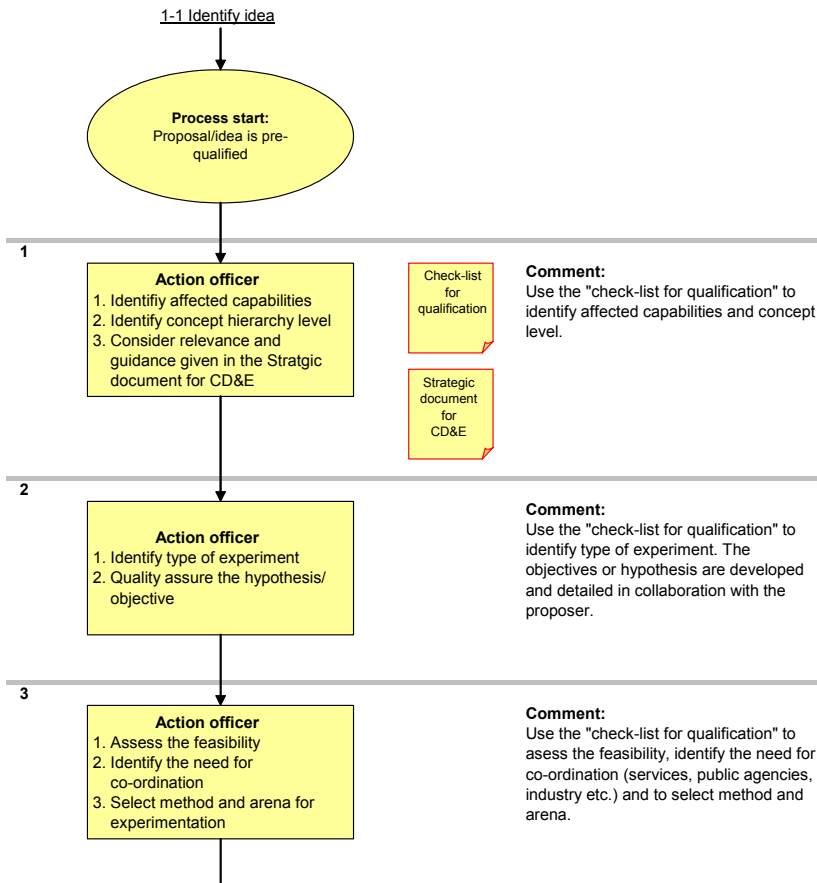
Clicking here gives access to the "Qualify idea" sub-process

The “Qualify Idea” Sub-Process Describes Tasks and Provides Check-Lists, Templates, etc



2-1 Qualify idea

The process starts with a pre-qualified proposal/idea and ends with a qualified proposal.



Final Remarks

The methodology is currently under final development and evaluation

- An early release is already in use by the Armed Forces

Final observations

- In order to make qualified decisions, interaction between decision makers and experimenters is critical
- The process web facilitates this interaction, helps the experimenter improve the experiment design, increases cost-benefit
- The quality of an actual experiment is improved