



Defensie

# Developing a C4I Architecture for the Netherlands Armed Forces

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# Presentation Structure

- **Why a C4I Architecture?**
- Starting point
- New approach
- C4I Architecture Products
- Process Model & Services Model
- What we learned so far

# Why a C4I Architecture?

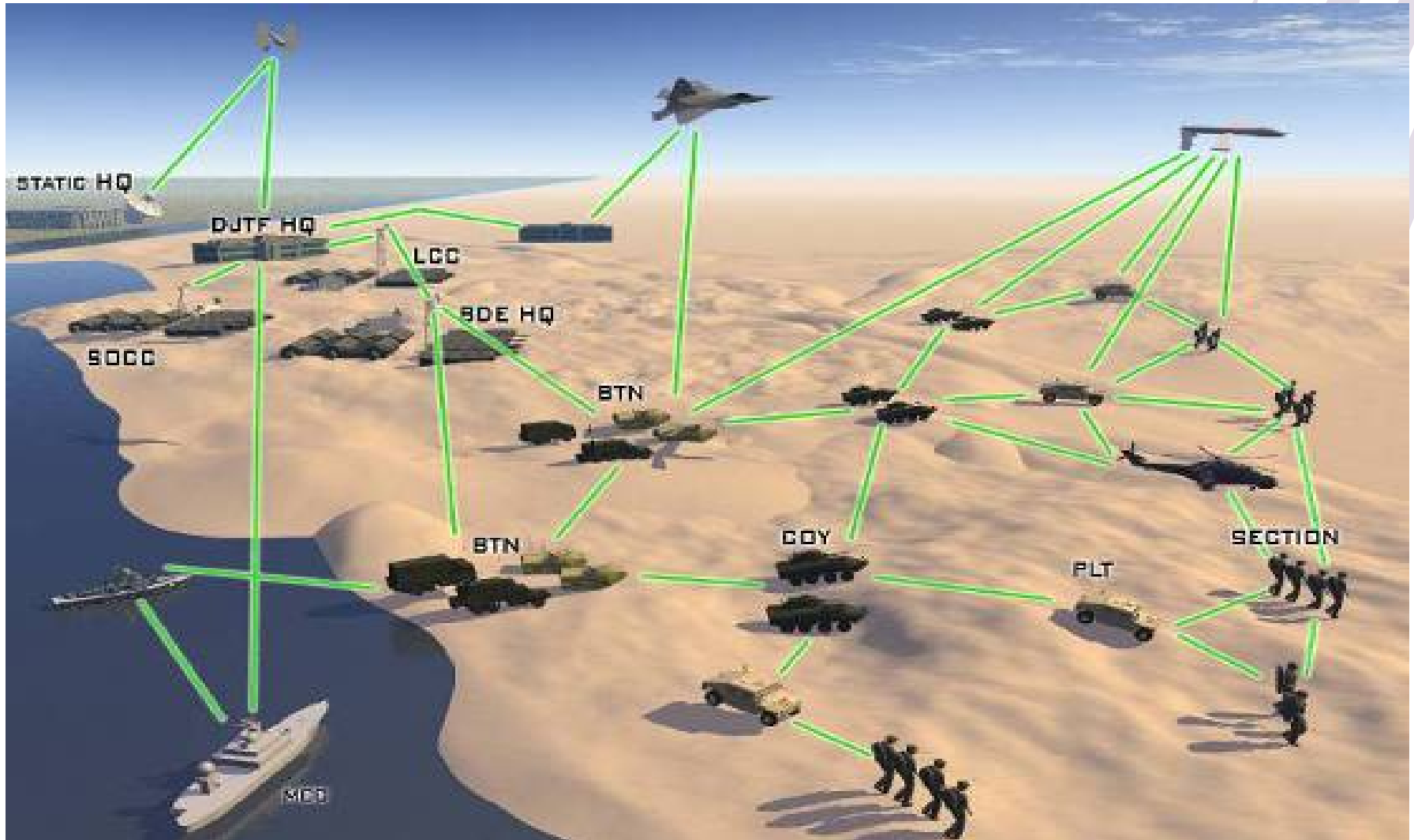
To improve Agility,

defined as:

***The ability to successfully cope with changes in the environment***

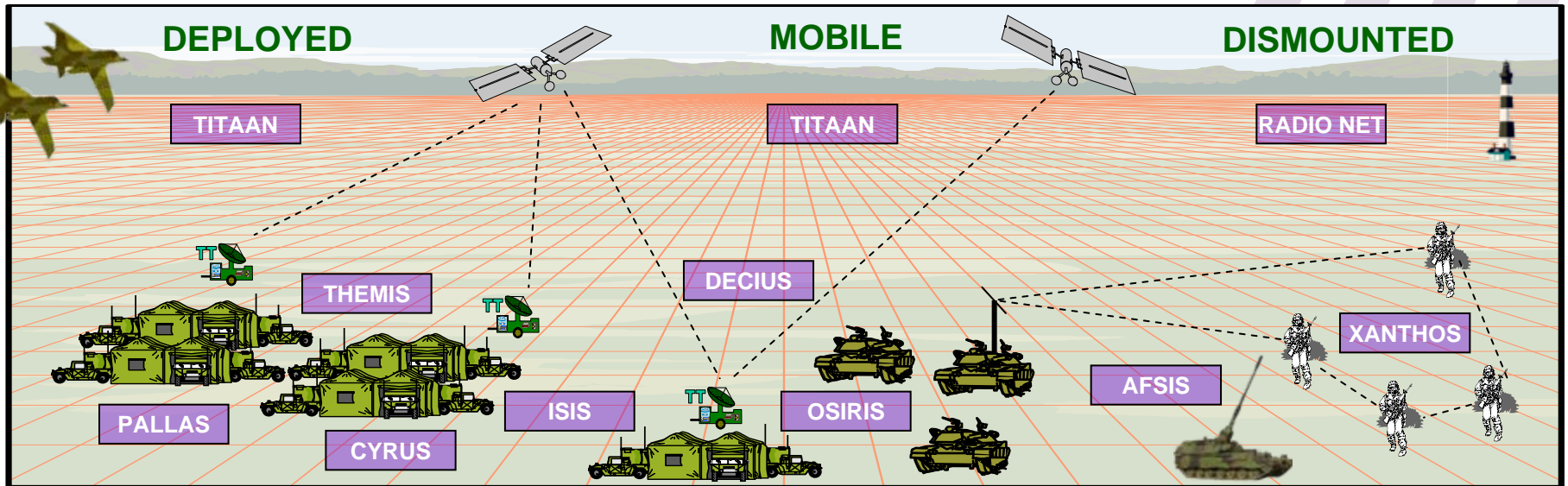
***(FACT Team paper, 18 April 2008)***

# Agility Challenge 1: Effective information sharing among dissimilar entities



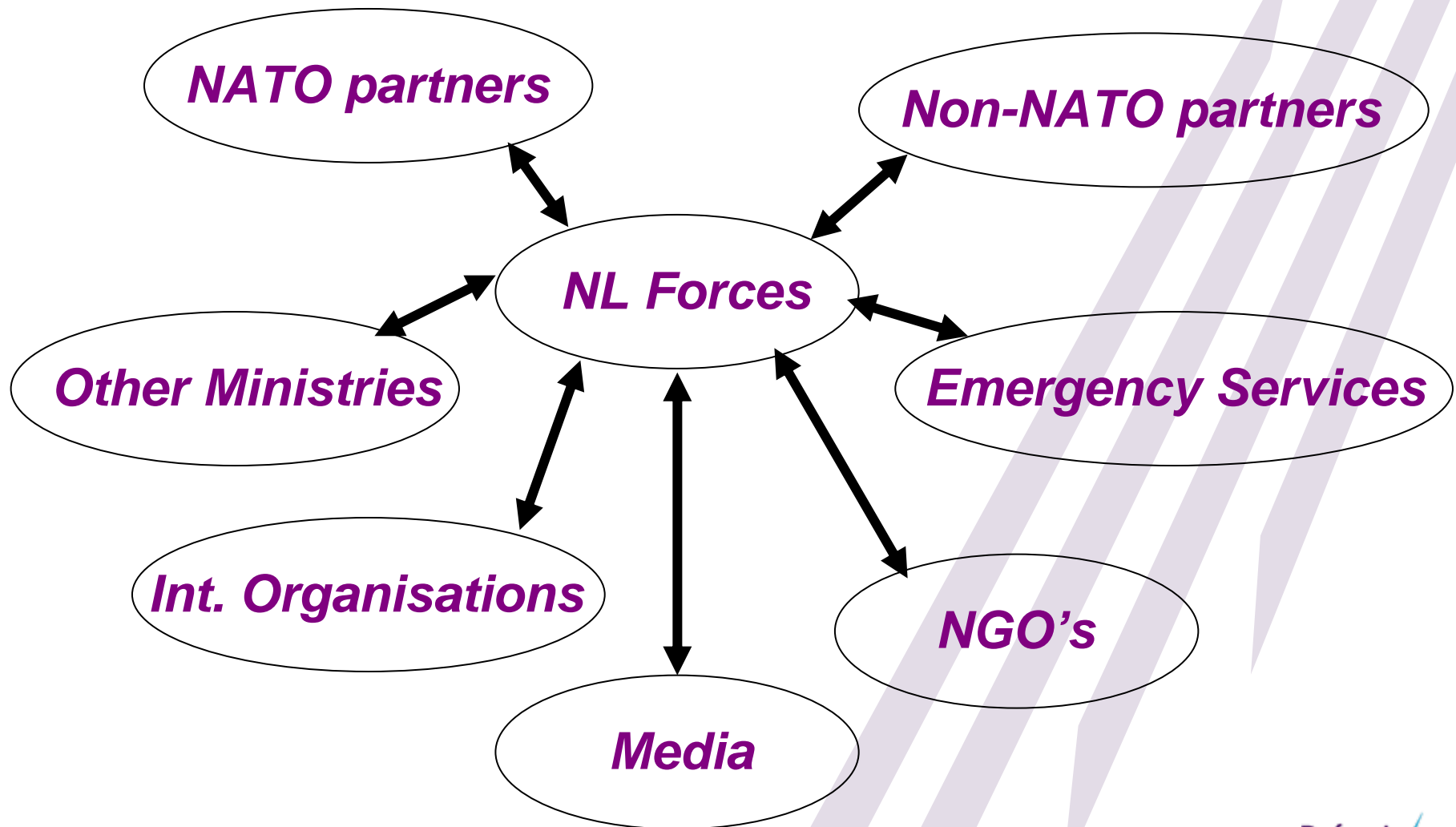
# Agility Challenge 2: maintaining the C2 chain

## NL Army suite of C2 systems





# Agility Challenge 3: information exchange with non-mil partners



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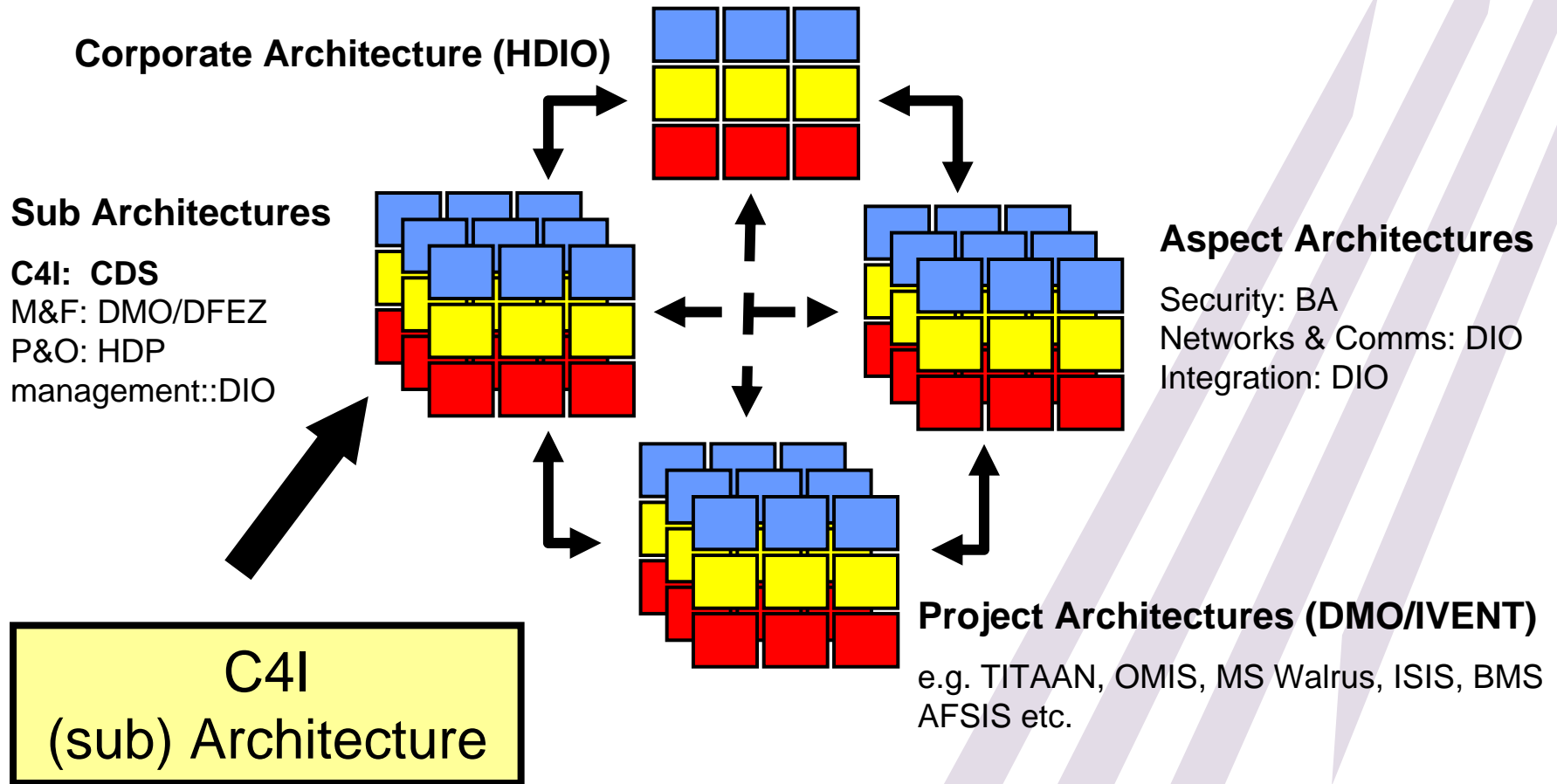
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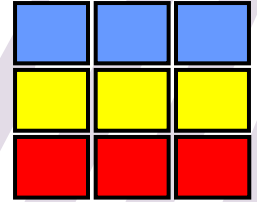
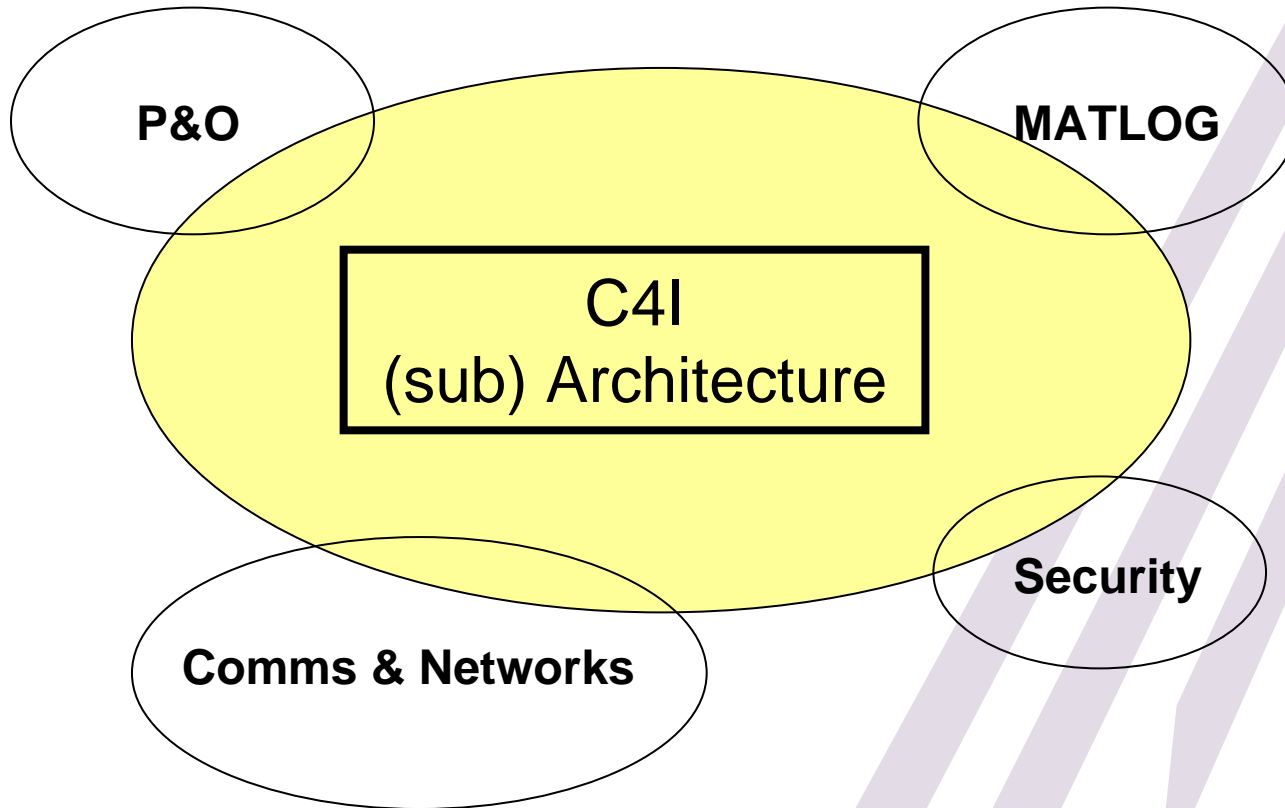
# DIVA Architecture Model

direction	composition	implementation
Goals and Tasks Environment Concept of Operations	Organisation Process Models Information Flow	Organisation-implementation Entities, Roles & Activities
Information Support Requirements	Information Services Model	Information Systems
Requirements for ICT Solutions	Components model	Building Blocks

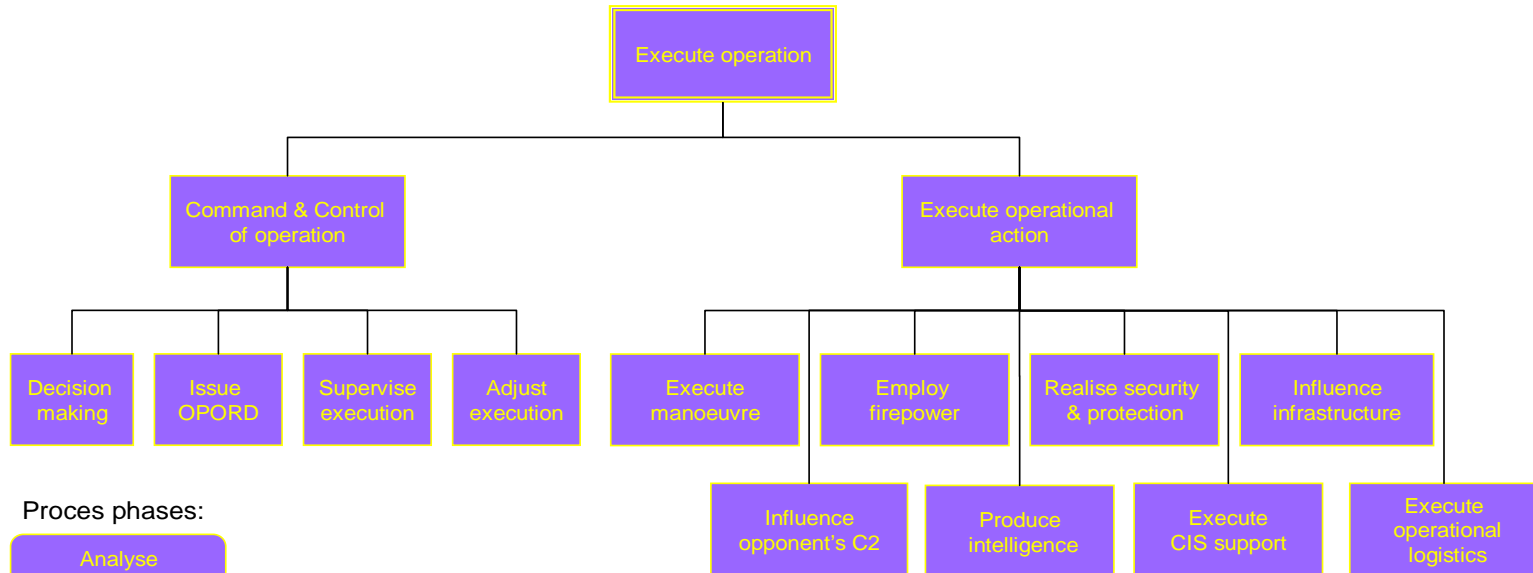
# DIVA Architecture Hierarchie



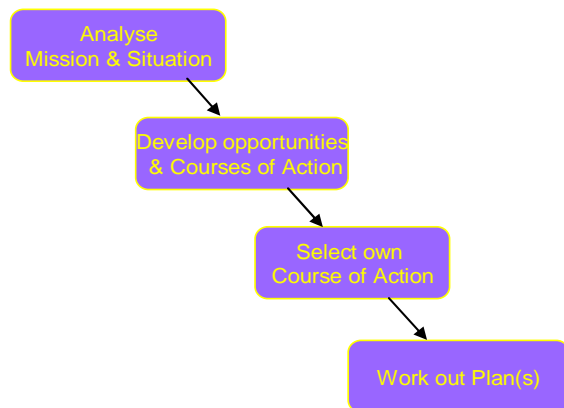
# C4I Architecture Scope



# Initial Operational Process Model



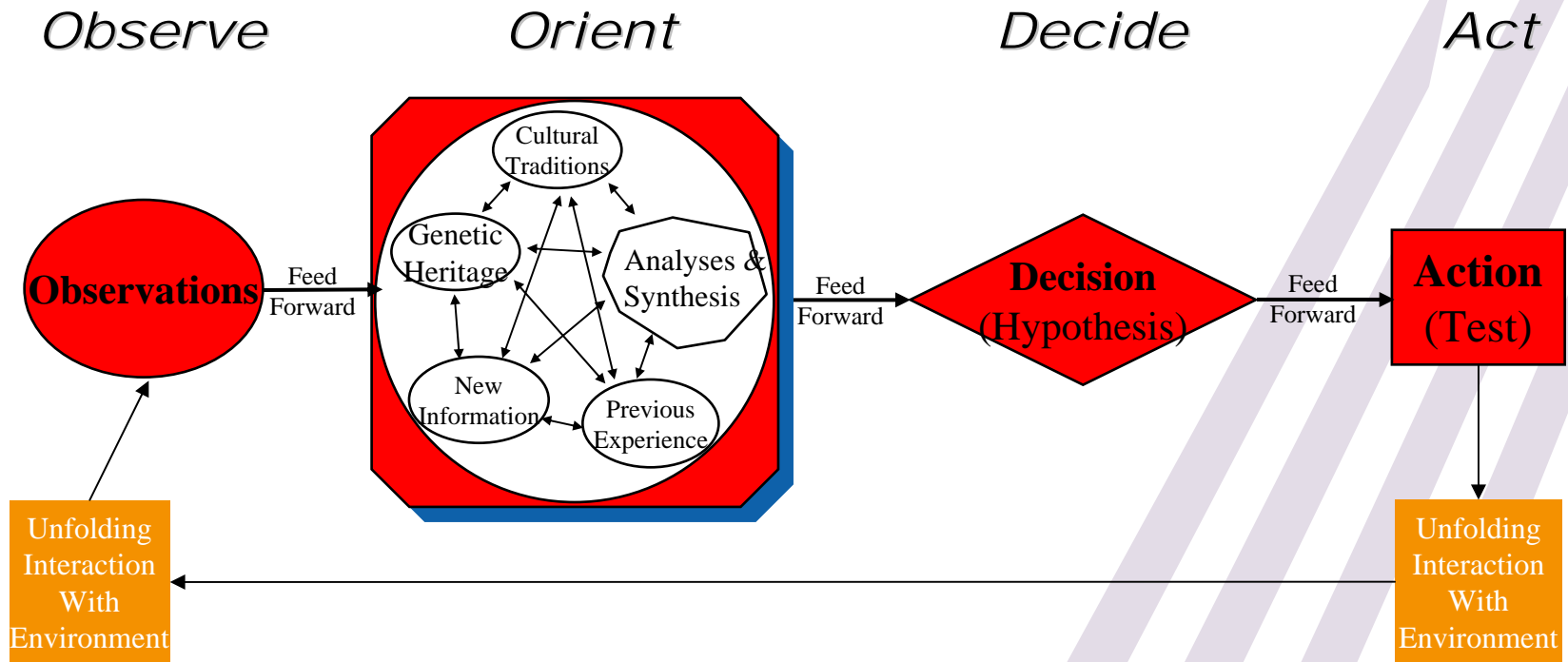
## Proces phases:



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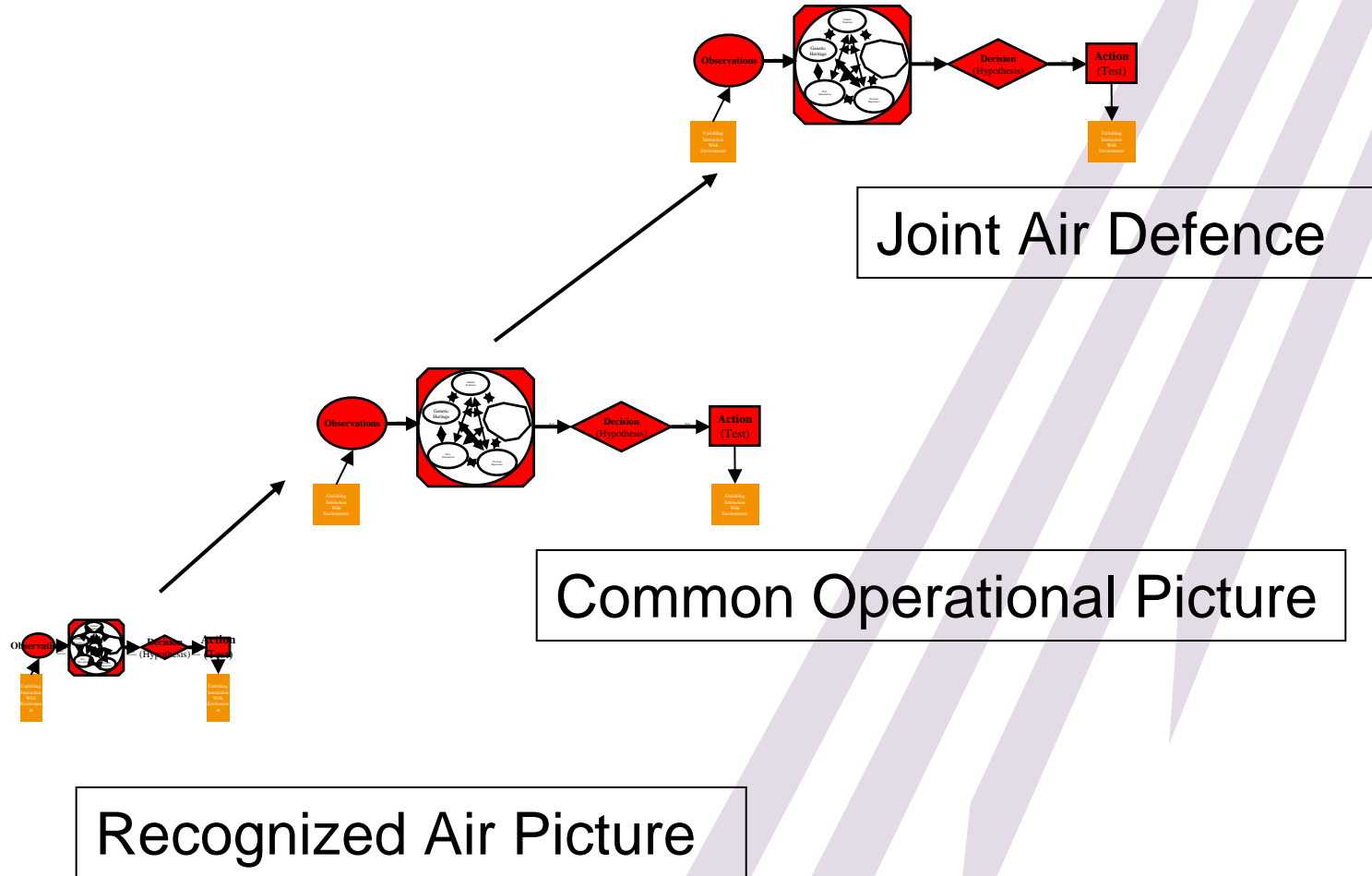
# Boyd's OODA loop



Note how orientation shapes observation, shapes decision, shapes action, and in turn is shaped by the feedback and other phenomena coming into our sensing or observing window.

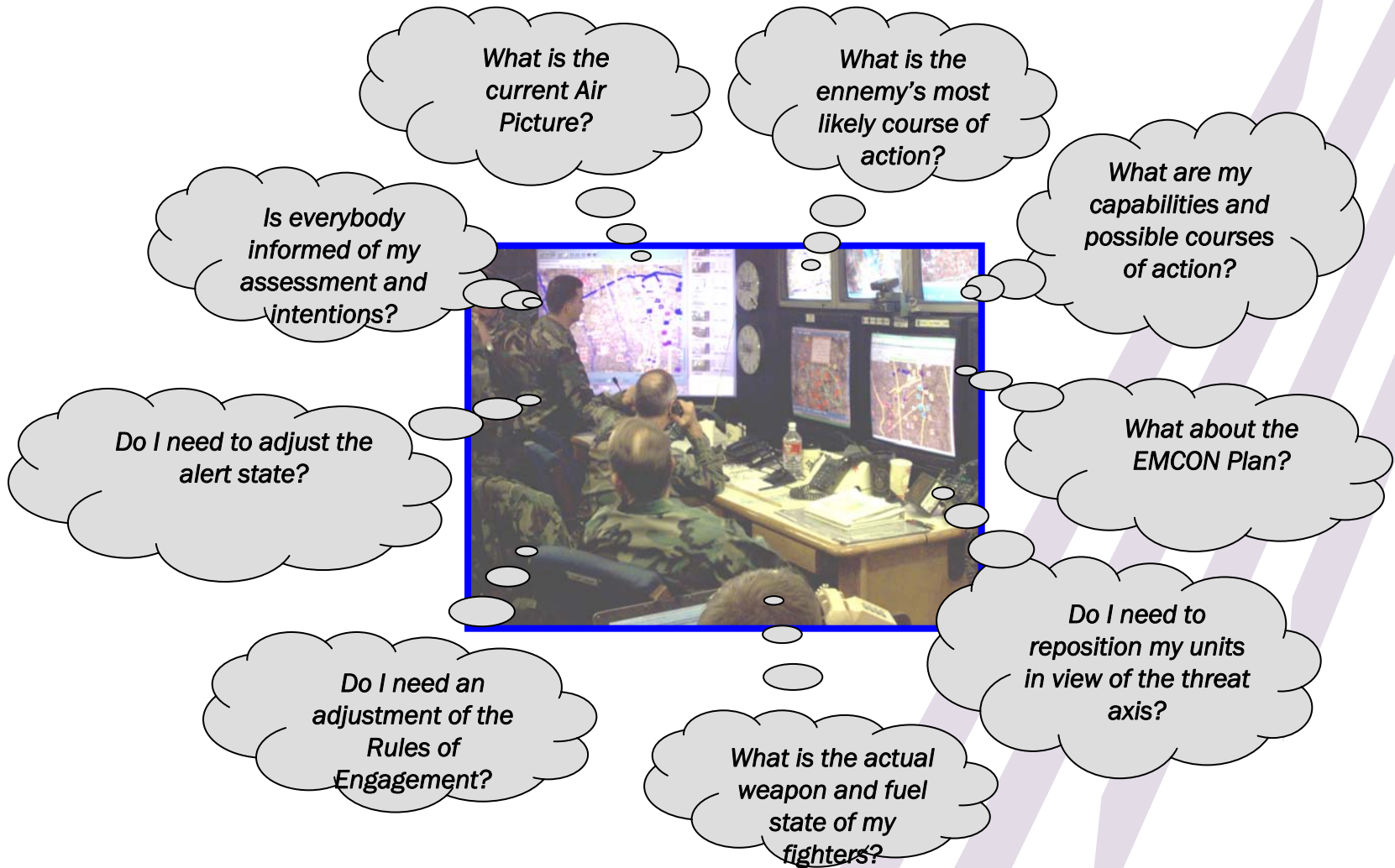
From "The Essence of Winning and Losing," John R. Boyd, January 1996.

# Possible Process Hierarchie





# Air Defence Parallel Processes



# Stakeholders & COIs

## Primary Stakeholders:

- CDS
- HDIO
- DMO
- CAMS & C2SC
- Major Operational Commands

## Predefined COIs:

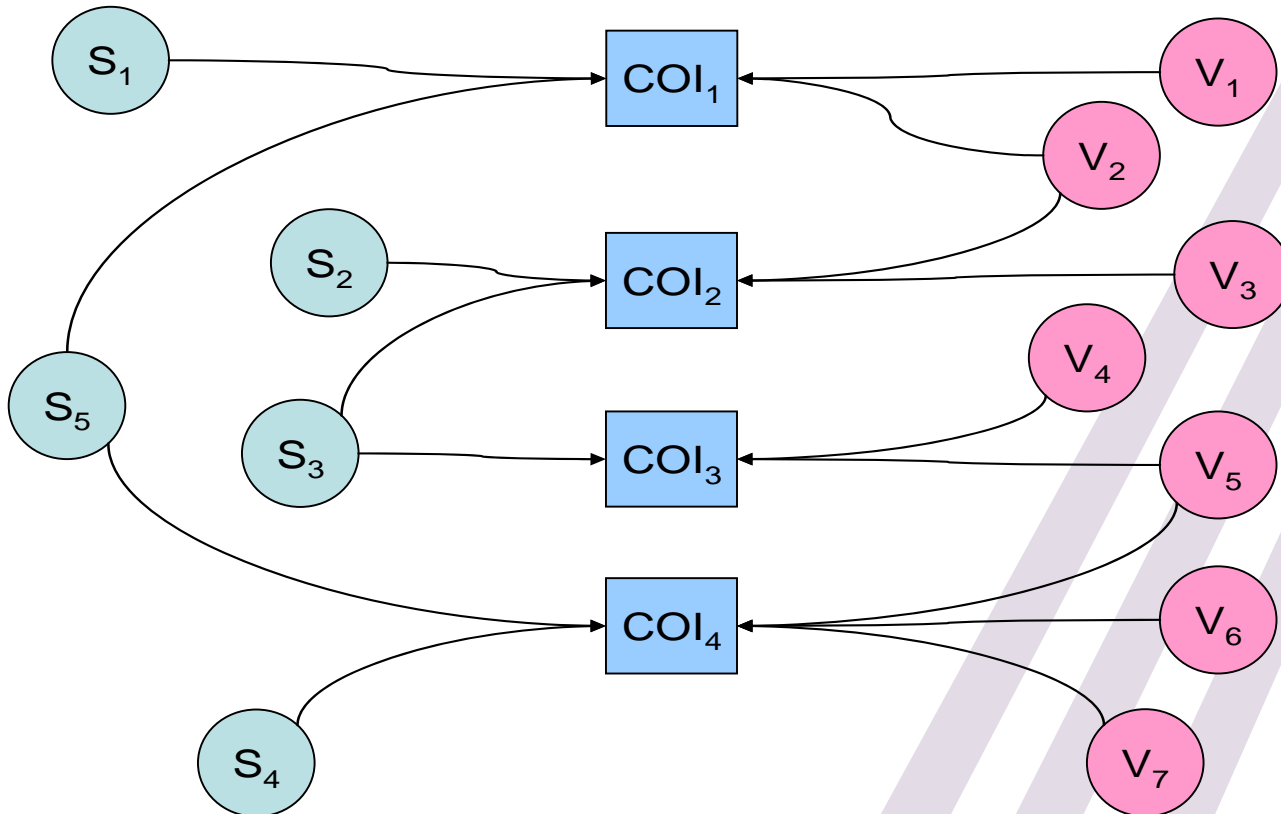
- Non-operational: policy&doctrine, planning&budget, requirements, acquisition, R&D, HRM
- Operational: OPS-planning, -support, -security, C4I-planning & -management, weapon employment, sensor management, ISR/INTEL, education & training

# Stakeholders, COIs and views

**Stakeholders**

**Communities of Interest**

**Views**



# Purpose C4I Architecture

- **provide guidance for definition C4I requirements**
- **support better scoping of C4I projects**
- **provide better cohesion between C4I projects**
- **provide guidance for project architectures**
- **set standards & technical requirements for C4I projects**

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- Why a C4I Architecture?
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- **C4I Architecture Products**
- Process Model & Services Model
- Next Steps
- What we learned so far

# C4I Architecture products

- C4I Basic Considerations & Principles
- C4I Standards & Technologies
- Checklist C4I Requirement Process
- Technical Requirements & Guidelines
- Operational Process Model
- Operational Information Services Model

# C4I Basic Considerations & Principles

direction	composition	implementation
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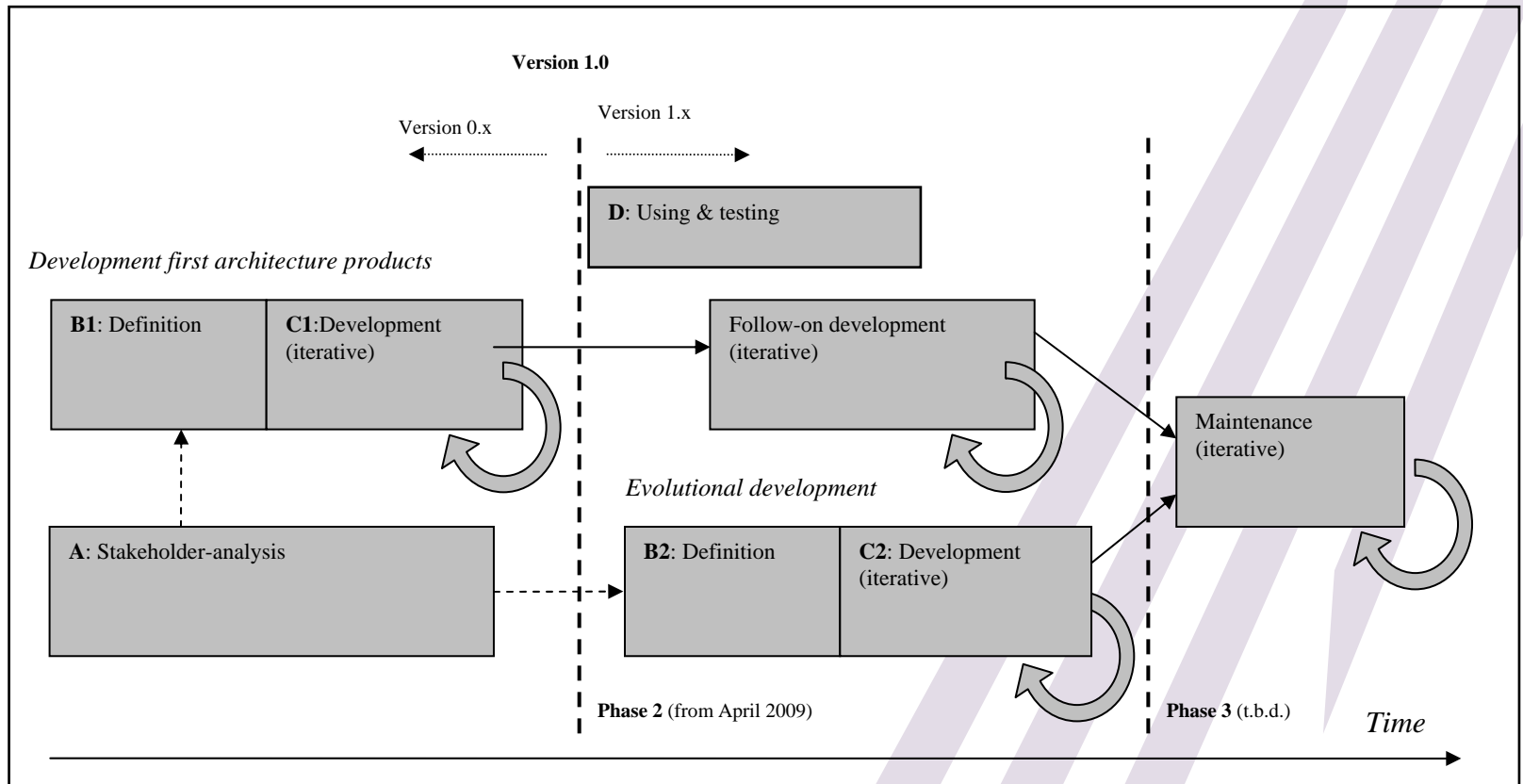
# C4I Standards & Technologies

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# Checklist C4I Requirement Process & Technical Requirements & Guidelines

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# Development model



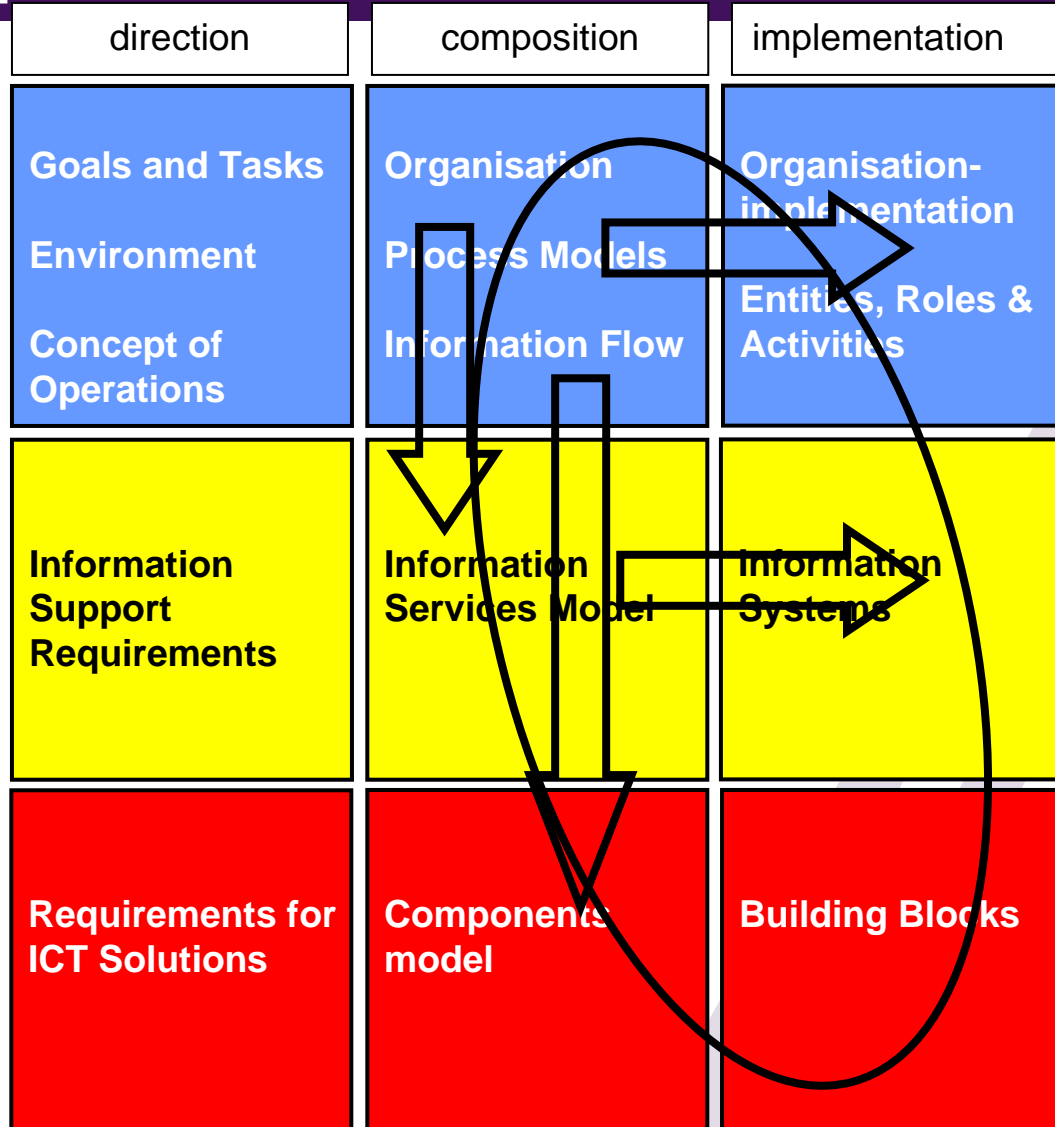
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# Development Process & Services Models

- **step 1: collect information at school / training center**
- **step 2: study material, develop 1st draft process model**
- **step 3: collect comments, develop 2nd draft**
- **step 4: test model by visits, observation, discussion**
- **step 5: correct, refine & amplify**
- **step 6: validate with all parties involved**

# Interdependencies



# Selection of processes to be modelled first

## Criteria:

- **Joint**
- **Combined**
- **Imperfect**
- **Complementary**

## Processes selected:

- **Joint Air Defence**
- **Picture Compilation Ground Operations**
- **Close Air Support**

**Next: Peace Support Ops, CIMIC**



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## What we learned so far

- **involve stakeholders early**
- **include non-operational information domains in scope**
- **show early, useable results**
- **build model bottom-up, using standardised format (e.g. OODA-Loop)**
- **model first joint & combined processes**
- **not all services are services ...**

## Further research

- **Suitability of DIVA methods & tools**
- **Suitability of C4I Architecture to support NEC transition**
- **Suitability of Service-Oriented Architecture to support info exchange between military & civil partners**

# Any questions?

