

ARMY

Developing Coherent, Concise and
Comprehensive User Requirements
Using the MoD Architectural Framework
(MODAF)

Lt Col Chris W Bailey (RE)

Maj Richard M Garbutt (REME)

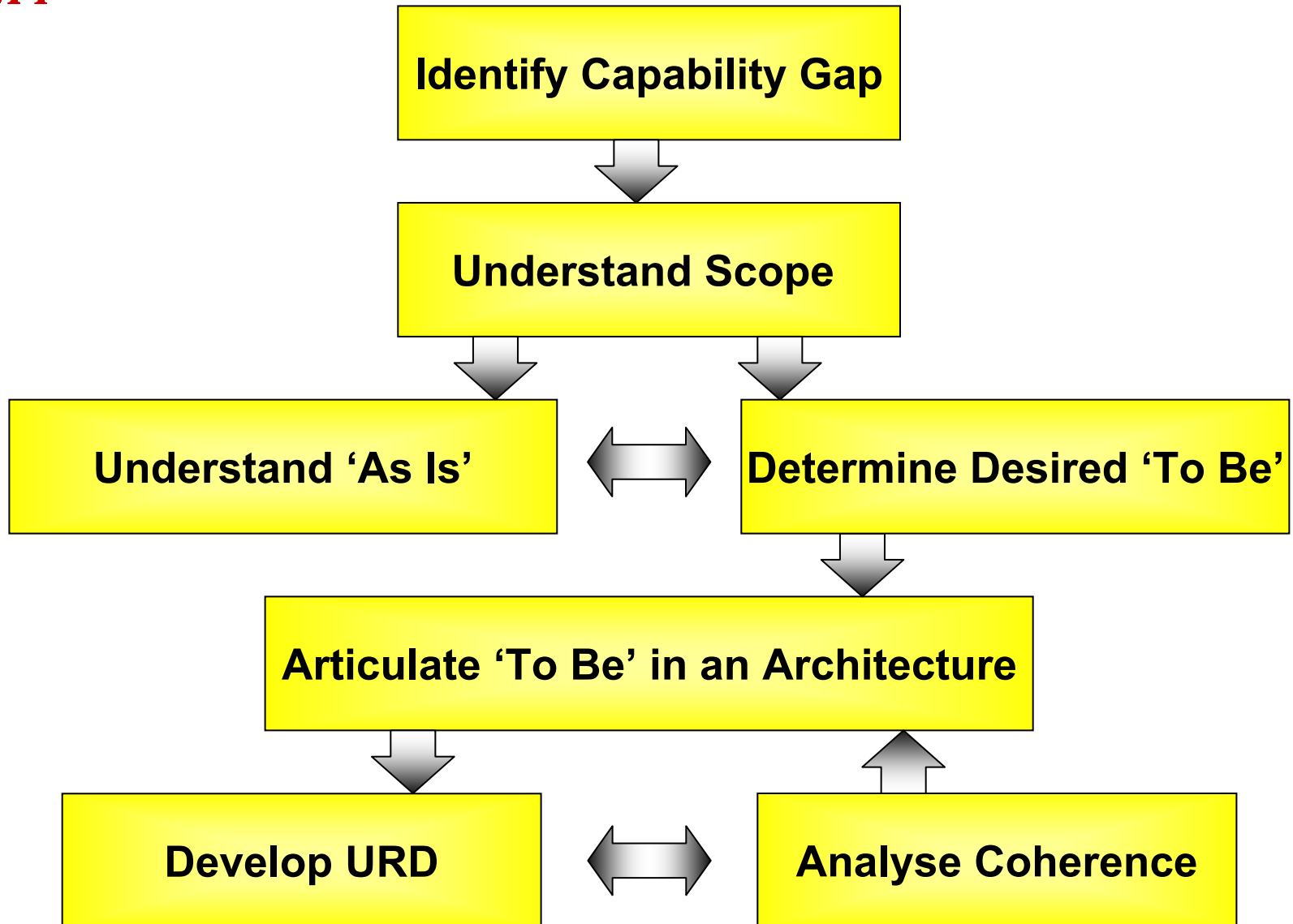


Introduction – The Problem

- The Military is Good At Doing – Bad At Describing
- Unambiguous & Comprehensive v Clear & Digestible
- Unintended Constraints
- Insufficient Information To Support Future Decisions
- Difficult To Review Text Based User Requirements For Completeness And Coherence With An Increasingly Complex System Of Systems



Outline Process





Using Architecture to Inform URD

LE CBM Architecture

Strategic / Capability

- Capability Vision
- Capability Functions
- Capability Phasing
- System of Systems
- Capability to System Deployment Mapping

OV-2 Orgs

OV-5 Processes

OV 7 Information

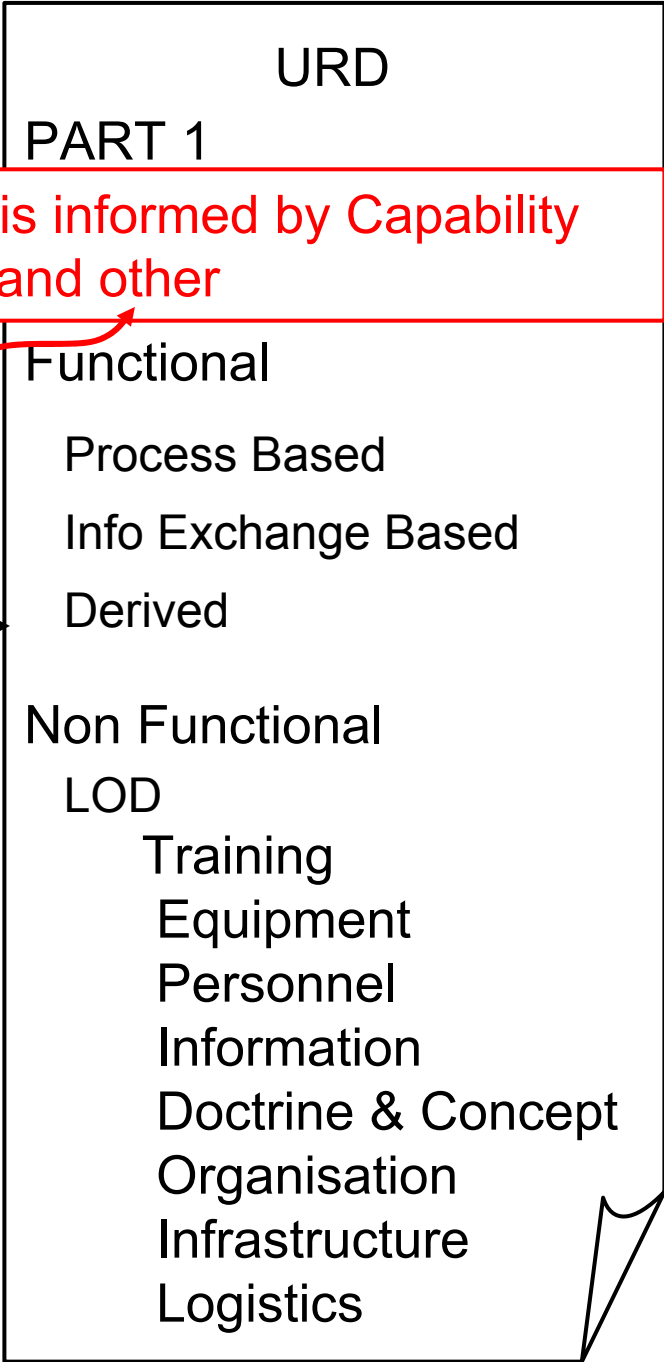
SVs System Views

Measures of Performance

Part 1 is informed by Capability Views and other

Explicit Business Knowledge

Need Articulated by





Using Architecture to Inform URD

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OV-2 Orgs



OV 7 Information

SVs System Views

Measures of Performance

Process Models used to Derive Process User Requirements

Need Articulated by

URD

PART 1

Process Based

Info Exchange Based

Derived

Non Functional

LOD

Concepts & Doctrine

Training

Structures & Estates

People

Sustainability

Usability

Security

Interoperability

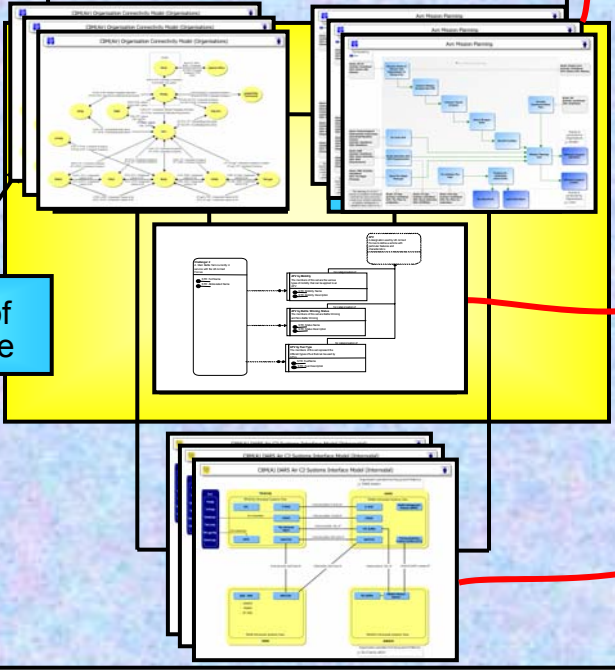


Using Architecture to Inform URD

LE CBM Architecture

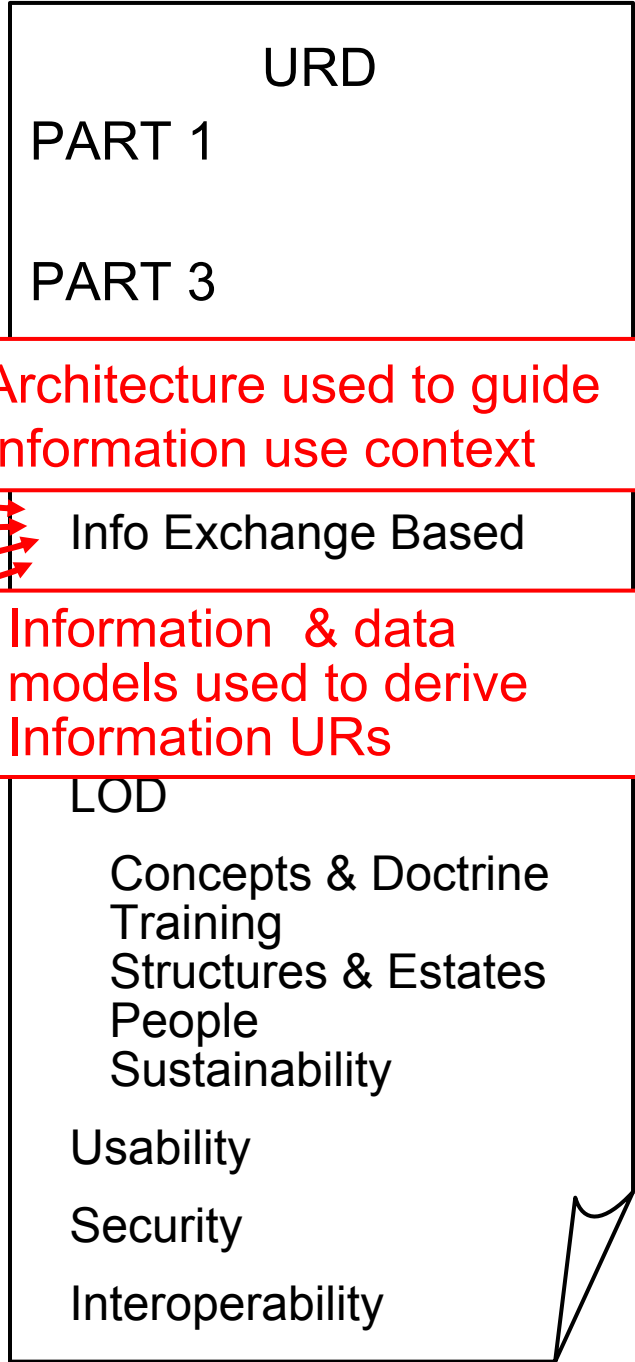
Strategic / Capability

- Capability Vision
- Capability Functions
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Measures of Performance

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OV-2 Orgs

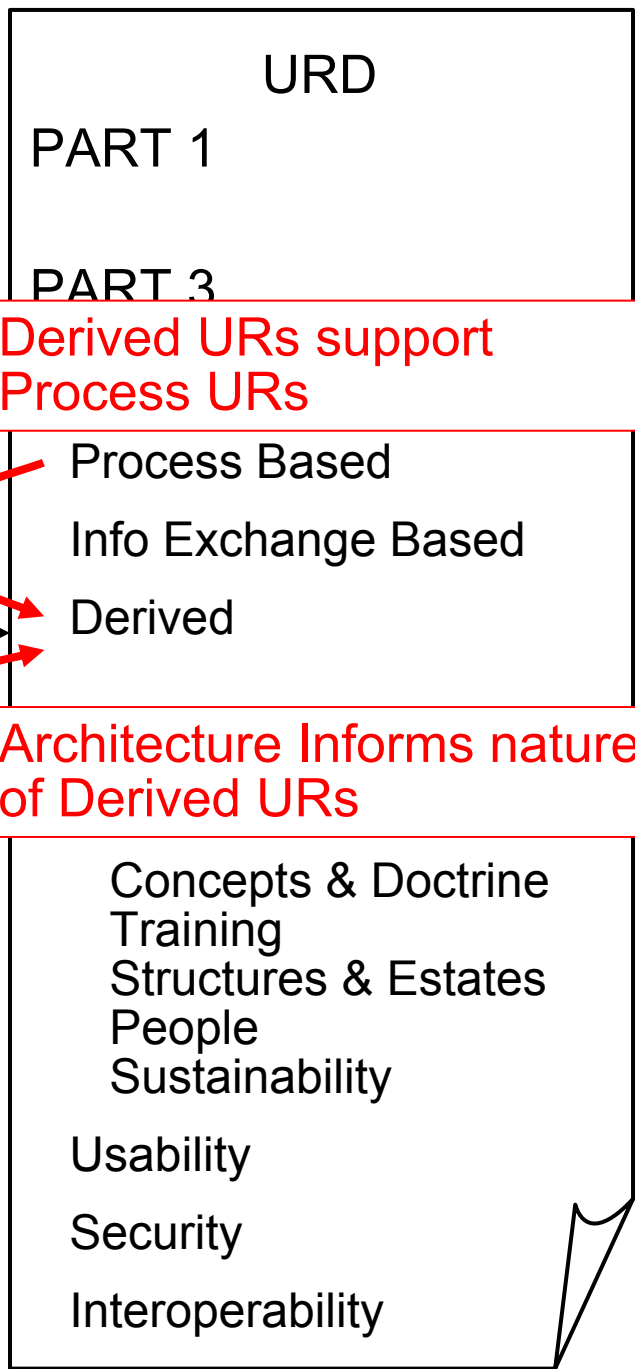
OV-5 Processes

OV 7 Information

SVs System Views

Measures of Performance

Need Articulated by



Derived URs support Process URs

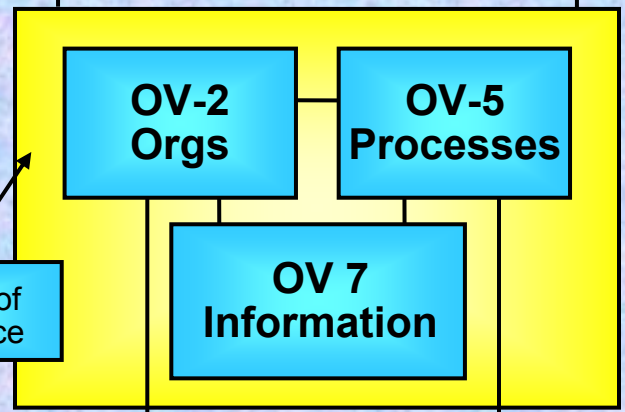
Architecture Informs nature of Derived URs



Using Architecture to Inform URD

LE CBM Architecture

- Strategic / Capability**
- Capability Vision
 - Capability Functions
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Measures of Performance

SVs System Views

Need Articulated by

URD

PART 1

PART 3

Functional

Process Based

Info Exchange Based

Derived

Non Functional

LOD

Concepts & Doctrine

Training

Structures & Estates

People

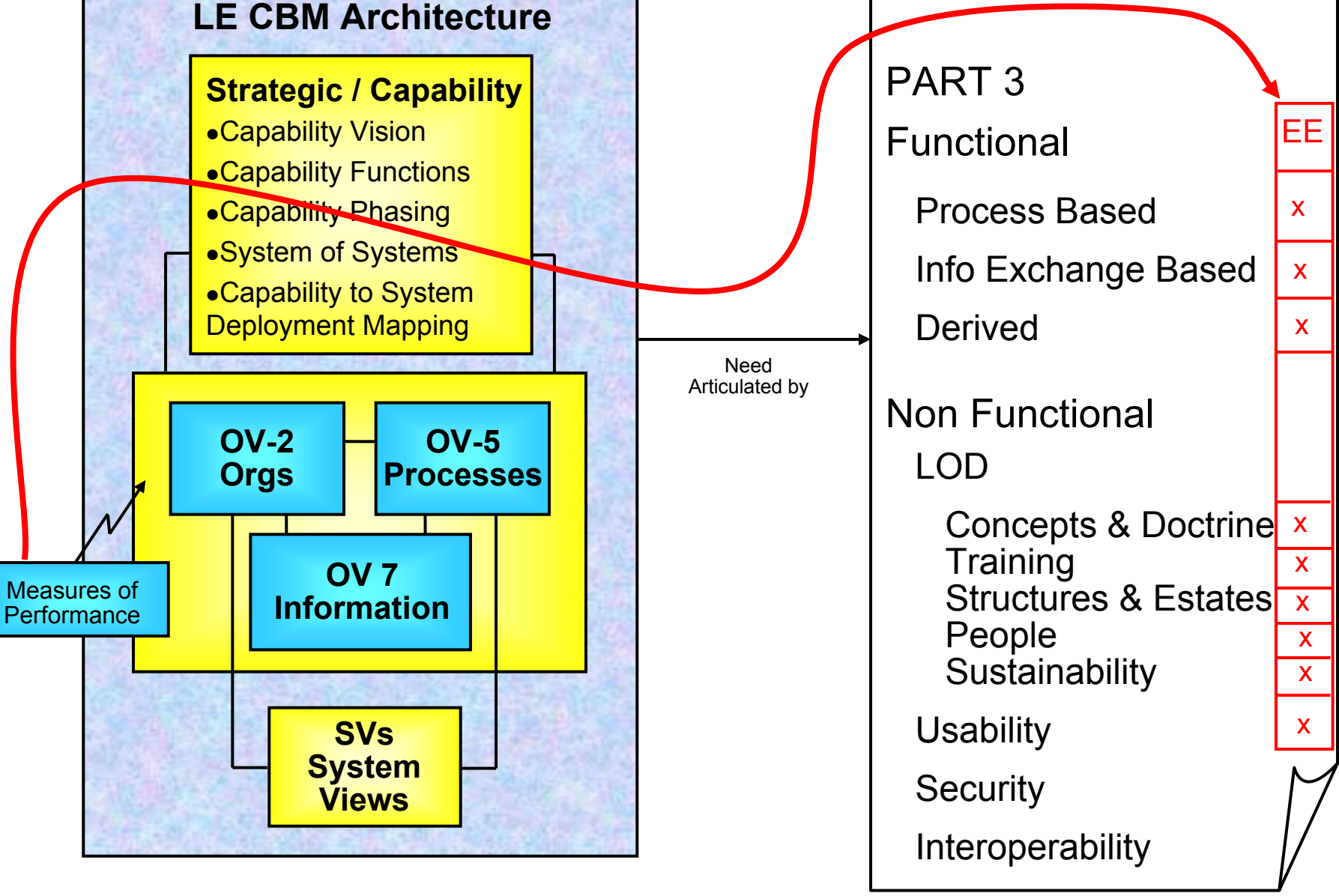
Sustainability

Usability

Security

Interoperability

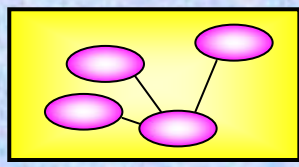
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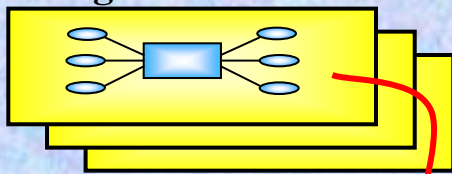


Using MODAF to Construct the URD

StV 1-5
Strategic Views



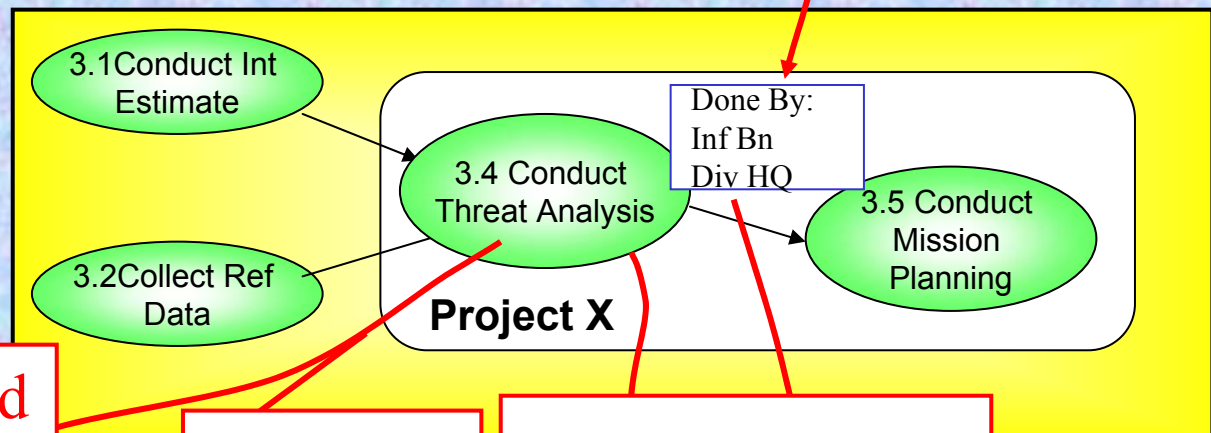
OV-2
Organisation Views



SV 1-5
System Views



OV-5 Processes



Whole MODAF Informs

Copied Into

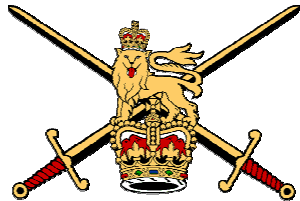
Expanded Into

Owners Derived

Reference Copied Into

XV-Requirements

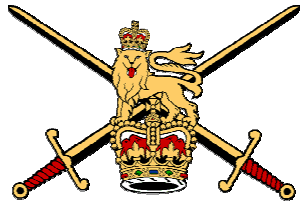
Title	User Ability	Context	EE	Owner	Justification	Verification
Conduct Threat Analysis	The user shall be able to	Threat analysis is required in order to	Stretch: abc Plan: xyz Now: Not done	Div HQ Supported by .	OV-5 3.4 Mission planning will be incomplete and . . . Without it	Bde level field exercise



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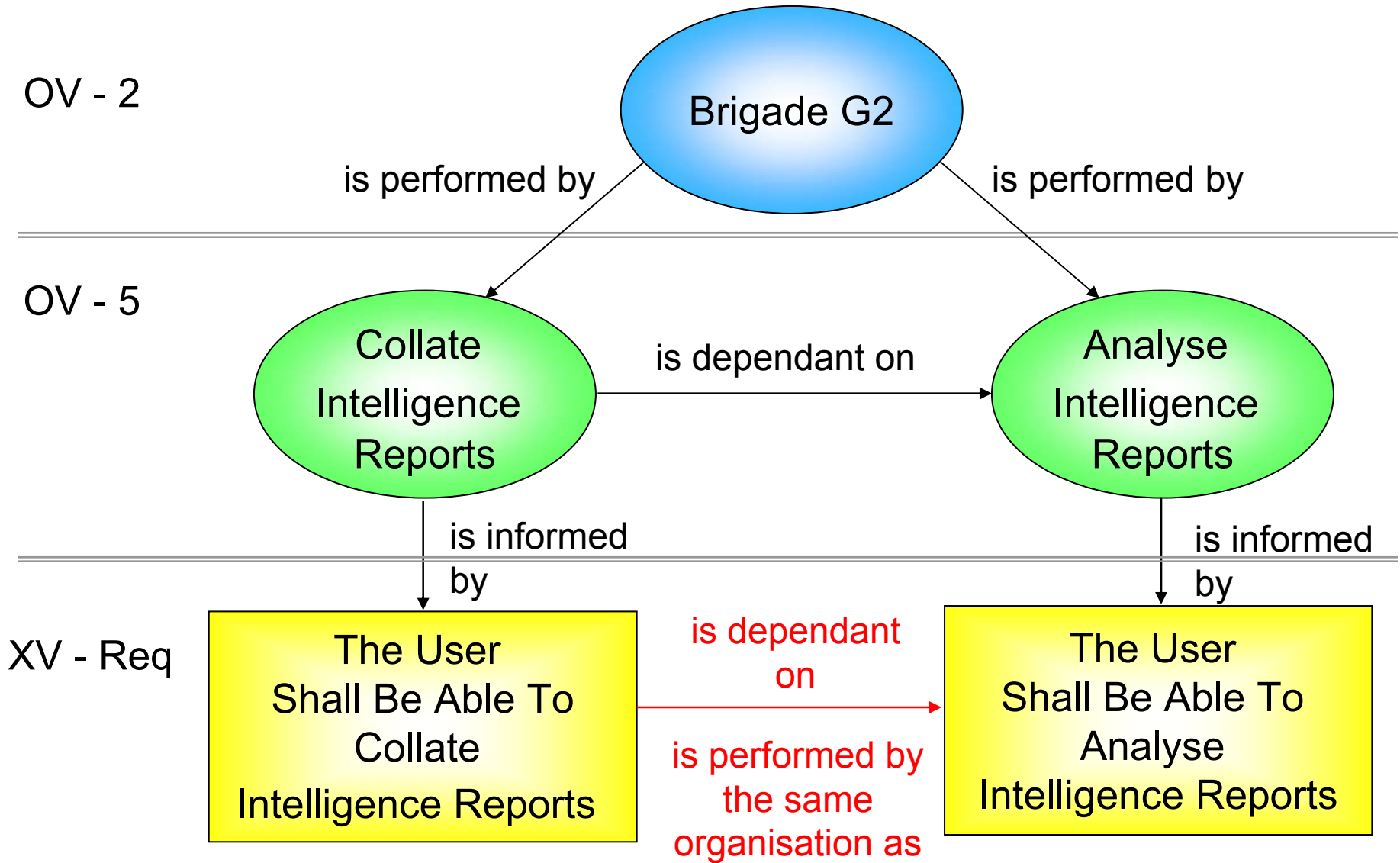
So What?

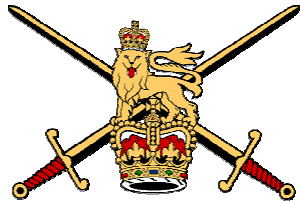
- Improved Articulation of the Requirement
 - Communicate the Intended Meaning and Provenance
 - Communicate the Context of each Requirement
 - Inform the Requirement Trading Process
 - Reduce UNINTENDED constraints
 - Understand the impact of business changes on projects under development
- Enables Analysis of URs based on complex relationships –
Requirements Coherence Analysis Tool (RCAT)



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Complex Relationships

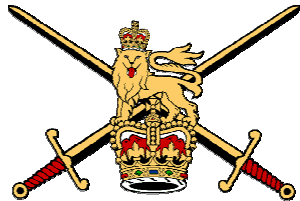




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Sources and Types of Relationships

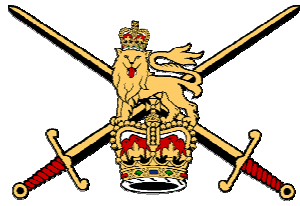
- Sources
 - Relationships articulated in the architecture
 - Relationships derived by RCAT analysis
 - Relationships derived (and implemented) in the architecture
- Types
 - Encapsulation
 - Dependency
 - Reference:
 - A requirement is derived from . . . (one to one)
 - A requirement is informed by . . . (many to one)



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The British Army's Requirement Engineering Tools

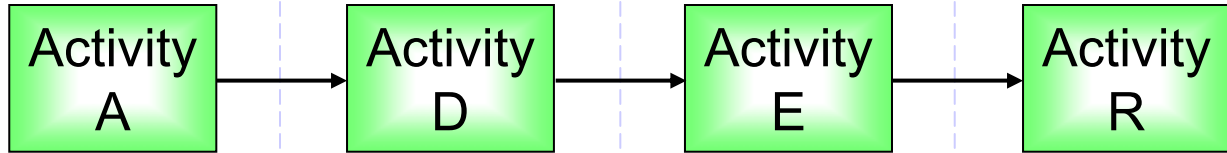
- MooD Transformation Toolset
- MooD Instantiation of the Defence Architecture Solution (MIDAS)
- Land Environment Command and Battlespace Management Architecture
- Requirement Coherence Analysis Tool



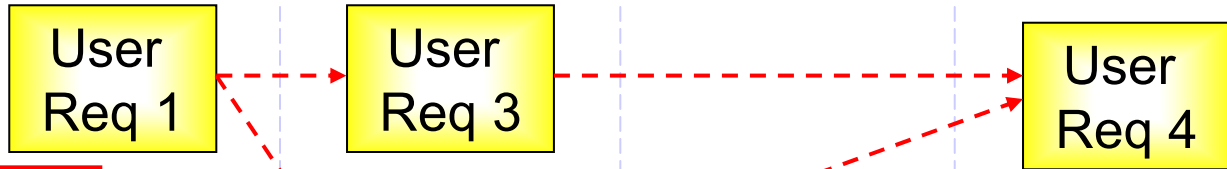
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Types of Analysis – Thread Analysis

In Model:
OV-5

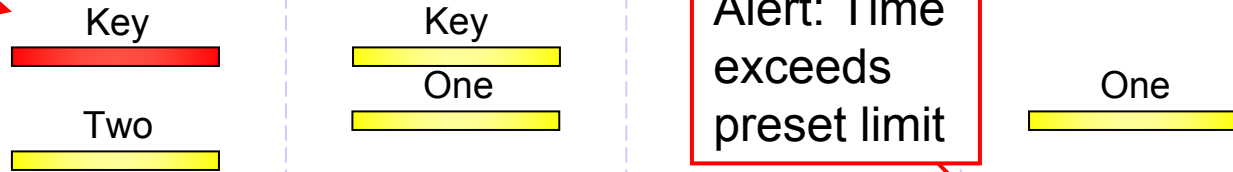


URD Alpha



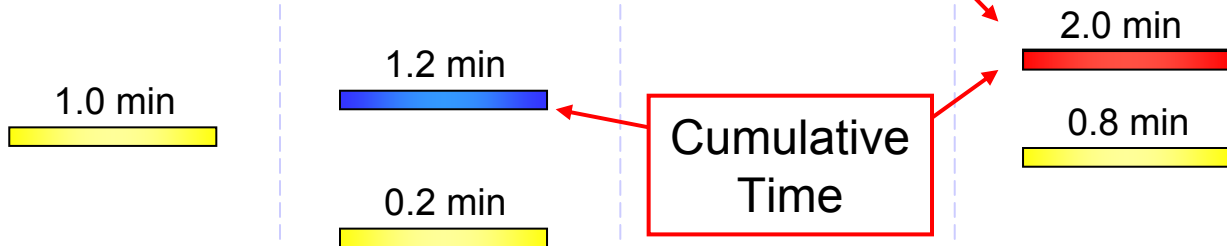
Alert: UR 1 Priority
May need to be
raised to Key

Priority

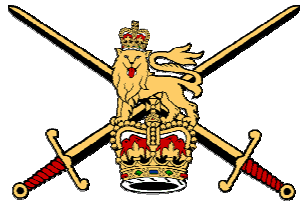


Alert: Time
exceeds
preset limit

Display Time



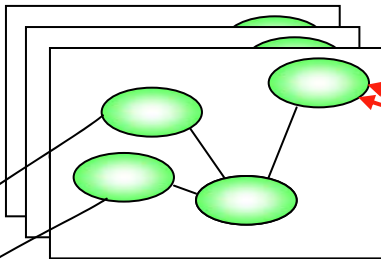
Cumulative
Time



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Create and Analyse a Single URD

Architecture Models

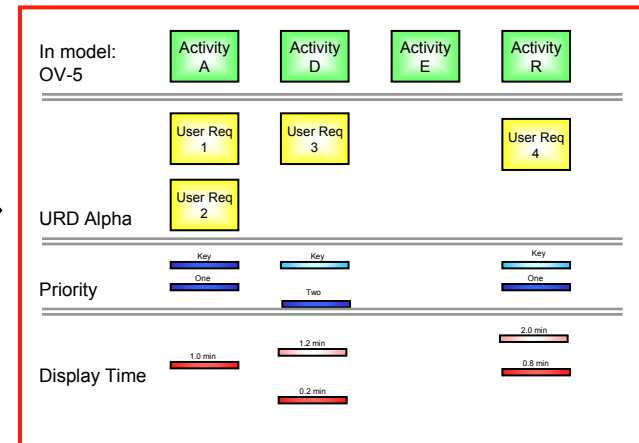


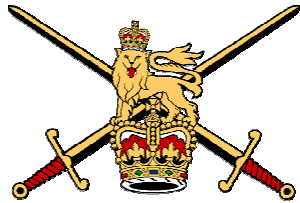
User Requirement Document

URD A			
	The user shall be able to		Must: display time . . . Stretch: display Now: display time
	The user shall be able to		Must: display time . . . Stretch: display Now: display time
	The user shall be able to		Must: display time . . . Stretch: display Now: display time
	The user shall be able to		Must: display time . . . Stretch: display Now: display time
	The user shall be able to		Must: display time . . . Stretch: display Now: display time

Semantic and
Lexicon
Language Analysis

Thread Analysis

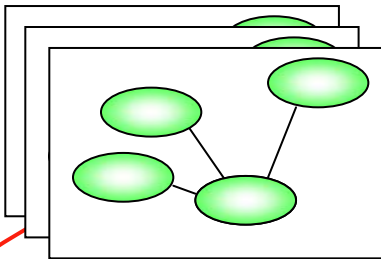




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Analyse Coherence Against Existing URDs

Architecture Models

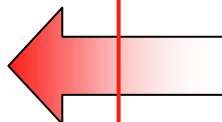
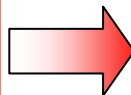
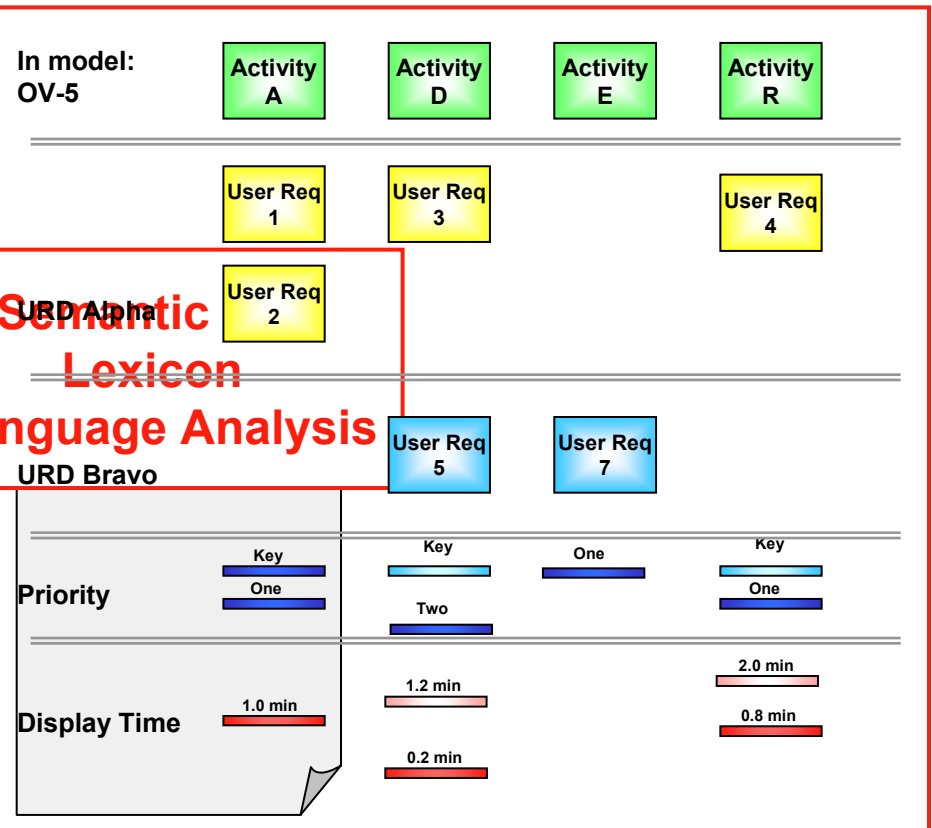


User Requirement Documents

URD A			
	The user shall be able to		Must: display time . . . Stretch: display Now: display time
	The user shall be able to		Must: display time . . . Stretch: display Now: display time

URD B			
	The user shall be able to		
	The user shall be able to		
	The user shall be able to		

Thread Analysis





Summary

- Requirements Derived from, referenced to and stored in MODAF
- Comprehensive Coverage That is Understandable by Users and Industry
- Coherence Analysis of URs based on complex relationships expressed in an Architecture