The Activity Domain

- A New Paradigm for Enterprise Architectures

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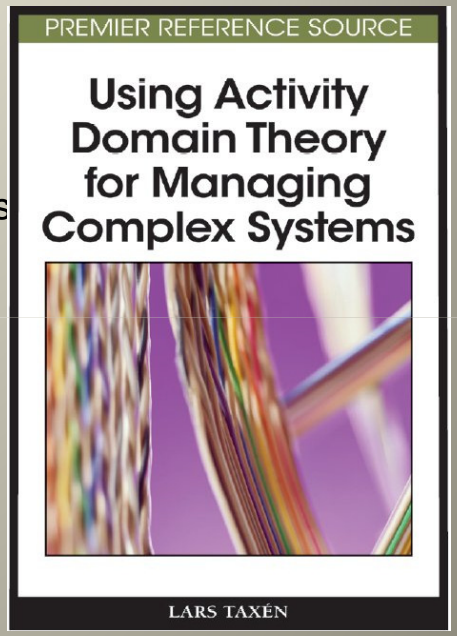
Who am I?

1968 - 1983 Methods and Tools developer, Ericsson AB
1983 - 1989 Line manager CAD Transmission, Ericsson AB
1989 - 1990 Department Specialist, CAD Transmission, Ericsson AB
1990 - 1990 Project Manager VHDL Pilot project, Ericsson AB
1990 - 1994 Process Designer HW, Ellemtel AB
1994 - 1995 Technical Manager, HW, Ellemtel AB
1995 - 1996 Process Designer SW & HW, Ellemtel AB
1996 - 1998 Method Developer of Incremental dev. SW, Ericsson AB
1998 - 2000 Technical Manager Matrix PLM support for Incr. dev. SW Ericss
2001 - 2002 Information System Coordinator, Core Network Ericsson AB
2002 - 2003 Process Developer PLM, Ericsson AB

1998 - 2003 PhD studies, Linköping Univ.
2003 - 2007 Associated Senior researcher, Linköping University
2007 - Associate professor, Linköping University

2003 - Consultant
PLM work for Siemens PLM Teamcenter PLM at Kockums,
Aalborg Industries, FMC Foodtech, Wärtsilä
PLM work for Siemens PLM Teamcenter PLM at Sandvik Coromant
PLM Information architecture work for Huawei Technologies
Member of FInES Expert Committee on Interoperability (EU)



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Outline

- **Some issues in Enterprise modeling**
- **A paradigm shift**
  - The Activity Domain at “the centre of the world”
- **An alternative approach**
  - Enterprise modeling
  - Enterprise System (ES) development
- **Summary**

Issues

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Complexity of enterprise management

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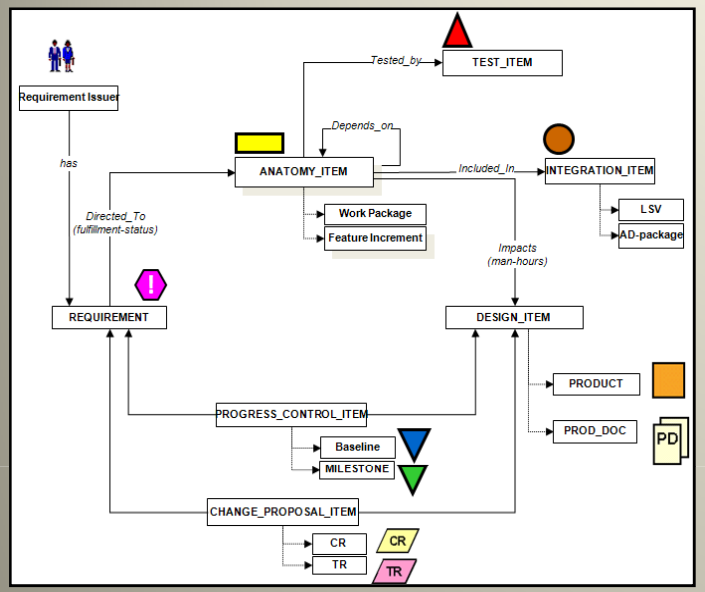
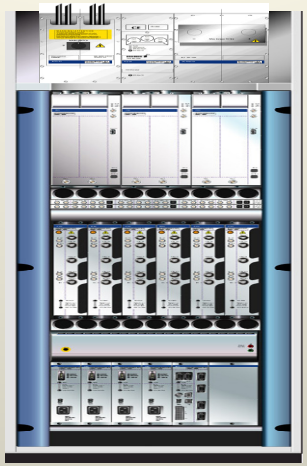
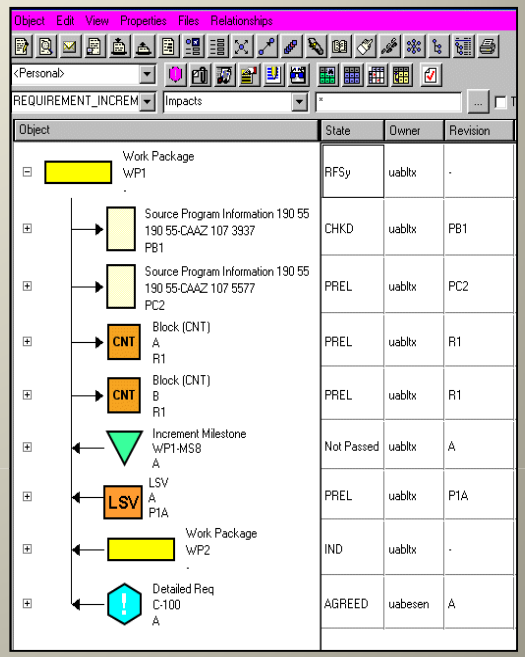
Information, data



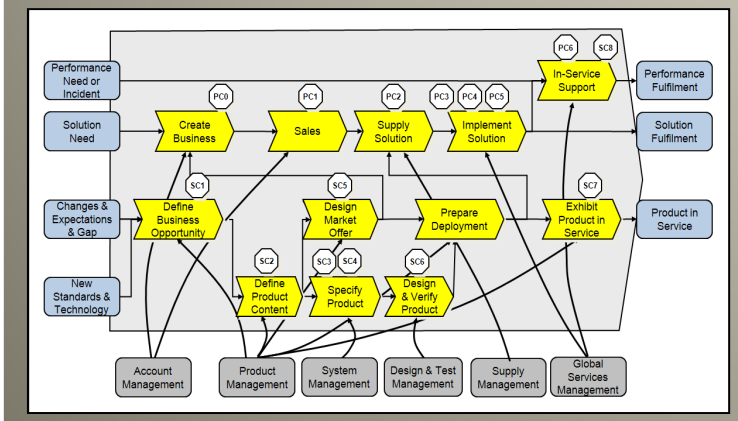
Products



Enterprise systems

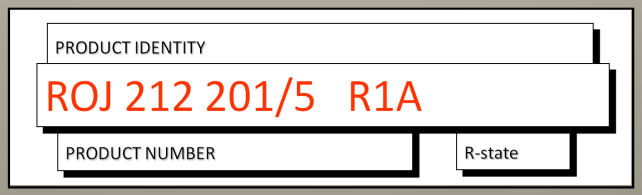


Processes

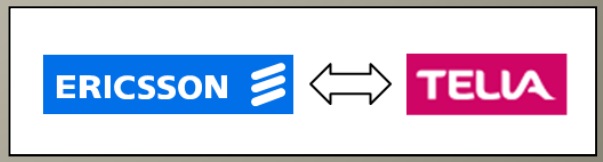


People

Business rules



Collaboration



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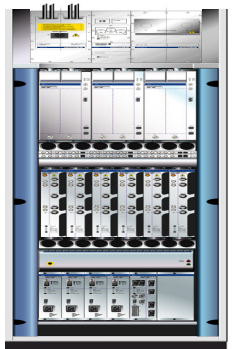
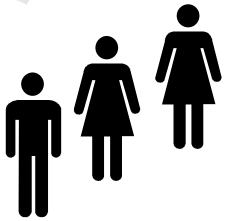
Zachman EA

		WHAT A	HOW B	WHERE C	WHO D	WHEN E	WHY F	
SCOPE	1	List of things important	Li	tions	List of organisations / agents that are impor	List of significant ev	List of business goals / strategies	**Planner**
BUSINESS MODEL	2	Sema M			Work F Model			**Owner**
SYSTEM MODEL	3	L M			H In Arc			**esigner**
TECHNOLOGY MODEL	4	Pl M		re	Pre Architect			**Builder**
DETAILED REPR.	5	Data Definition		rk Architecture	Security Architecture	Timing Definition	Rule Specification	**Programmer**
FUNCTIONING ENTERPRISE	6	Usable Data	Working Function	Usable Network	Functioning Organization	Implemented Schedule	Working Strategy	**User**
		DATA	**FUNCTION**	**NETWORK**	**PEOPLE**	**TIME**	**MOTIVATION**	



Product ?



People ?

Each cell must be modeled (30)
Transitions between cells must be defined (60)
Stakeholder must agree on this

Simply not doable; more like a checklist

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An example…

		WHAT A	HOW B	WHERE C	WHO D	WHEN E	WHY F	
SCOPE	1	List of things important to business	List of processes the business performs	List of locations which the business operates	List of organisations / agents that are important	List of significant events	List of business goals / strategies	**Planner**
BUSINESS MODEL	2	Semantic Model	Business Process Model	Business Logistics Syst.	Work Flow Model	Master Schedule	Business Plan	**Owner**
SYSTEM MODEL	3	Logical Data Model	Application Architecture	Distributed System Architecture	Human Interface Architecture	Processing Structure	Business Rule Model	**Designer**
TECHNOLOGY MODEL	4	Physical Data Model	System Design	Technology Architecture	Presentation Architecture	Control Structure	Rule Design	**Builder**
DETAILED REPR.	5	Data Definition	Program	Network Architecture	Security Architecture	Timing Definition	Rule Specification	**Programmer**
FUNCTIONING ENTERPRISE	6	Usable Data	Working Function	Usable Network	Functioning Organization	Implemented Schedule	Working Strategy	**User**
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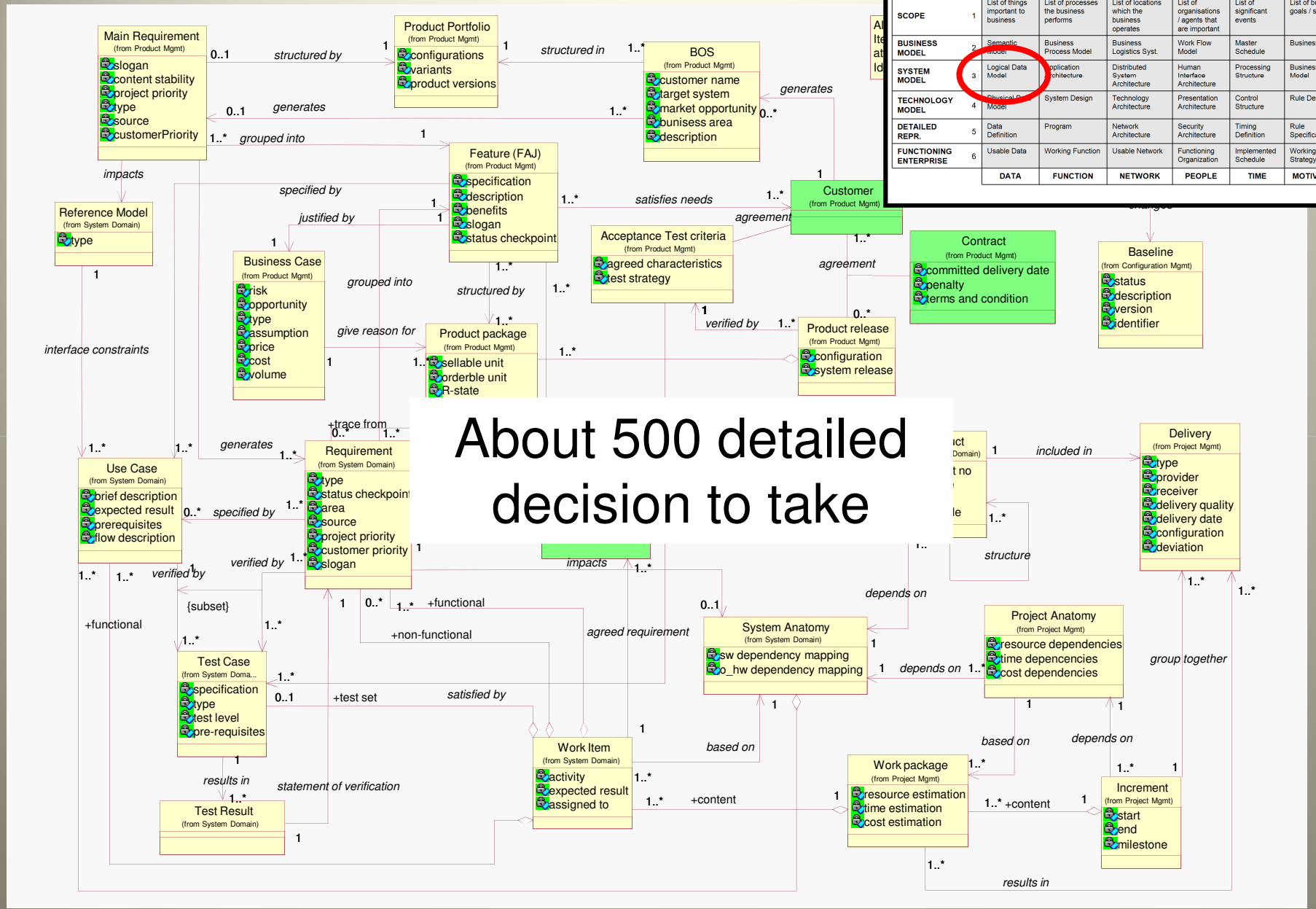

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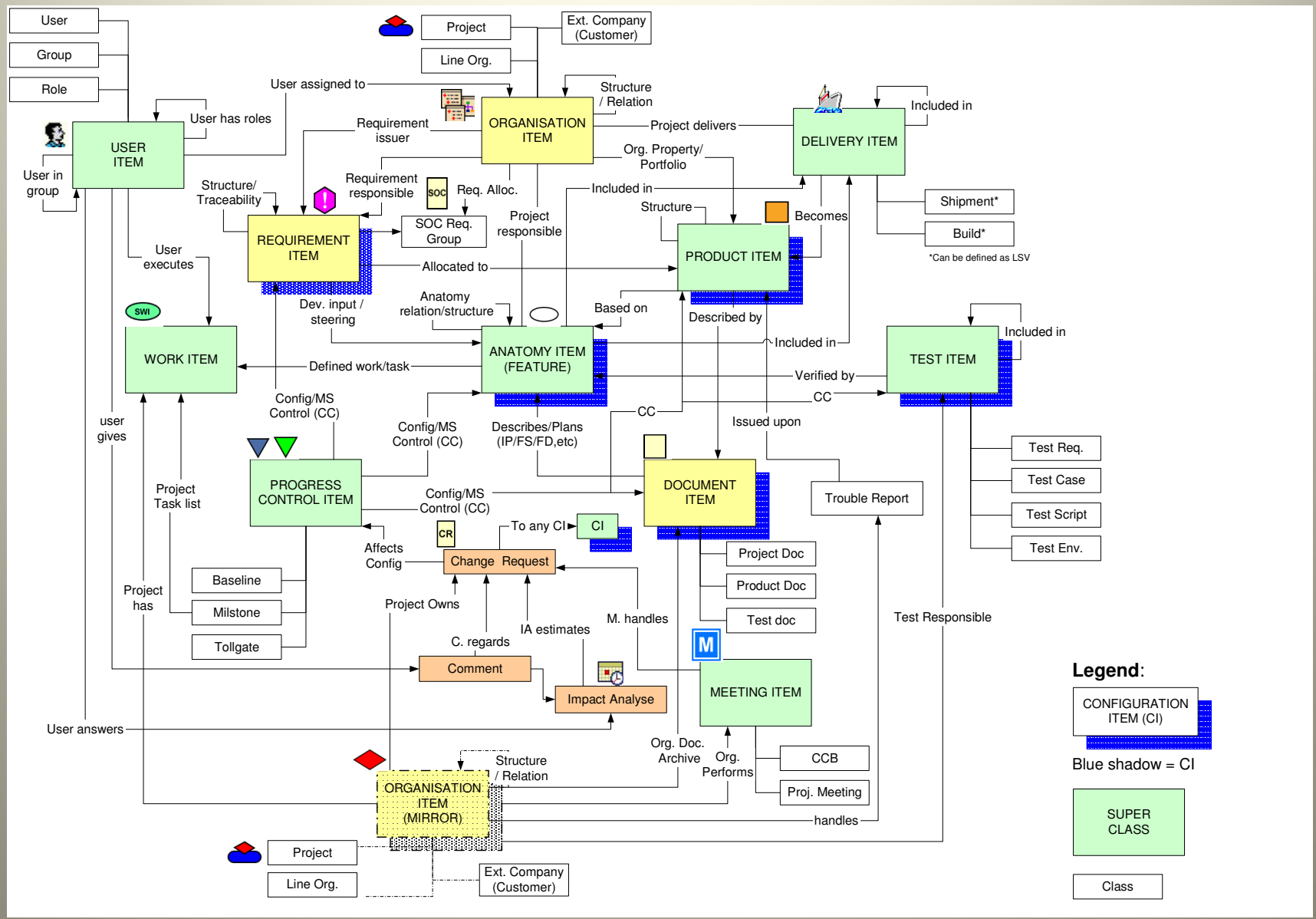

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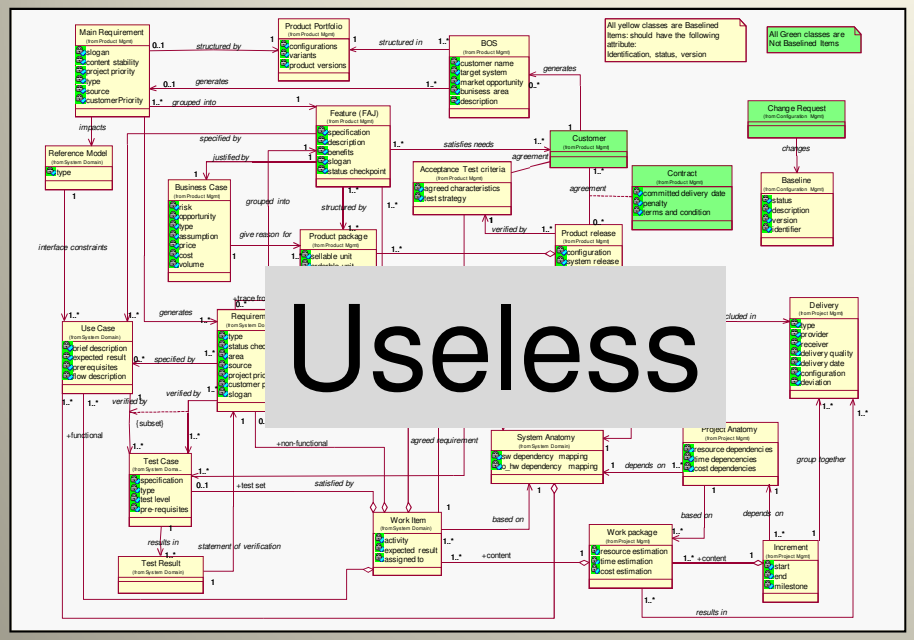
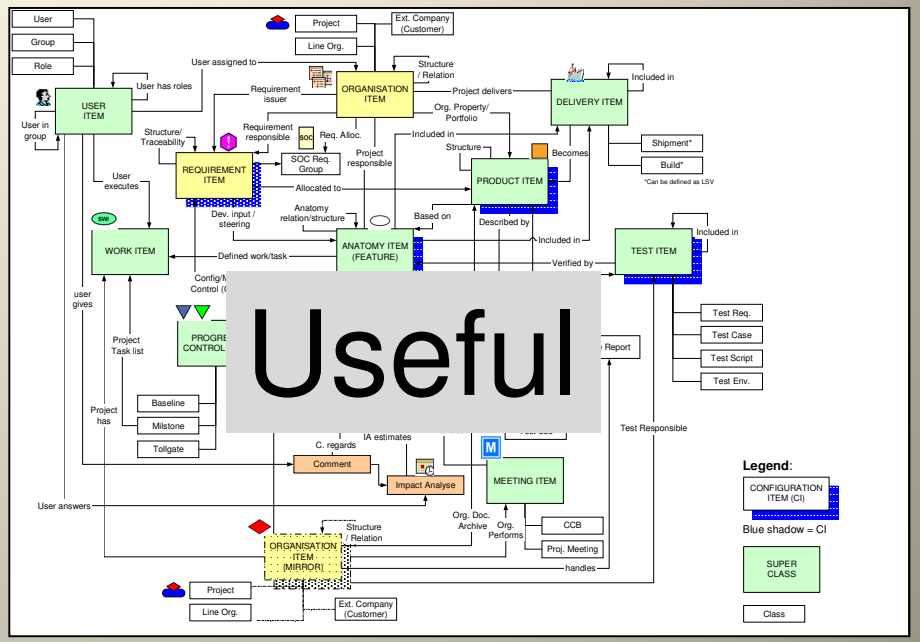
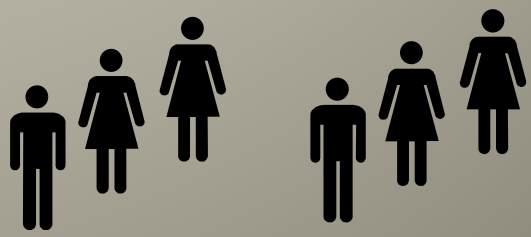




Defined by a consultant “in the chamber”

Chiseled out “on the combat field” between 1997 - 2003



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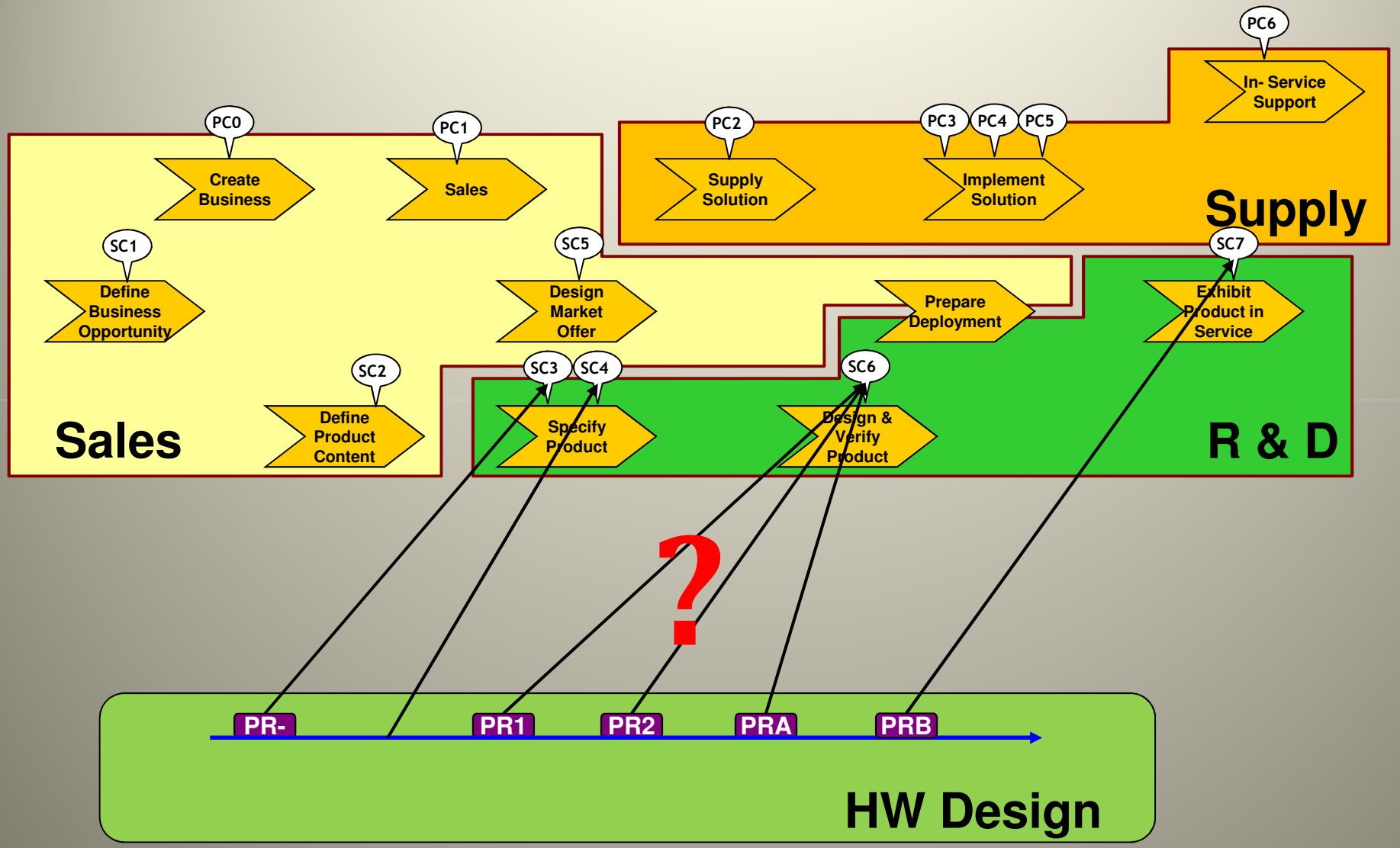
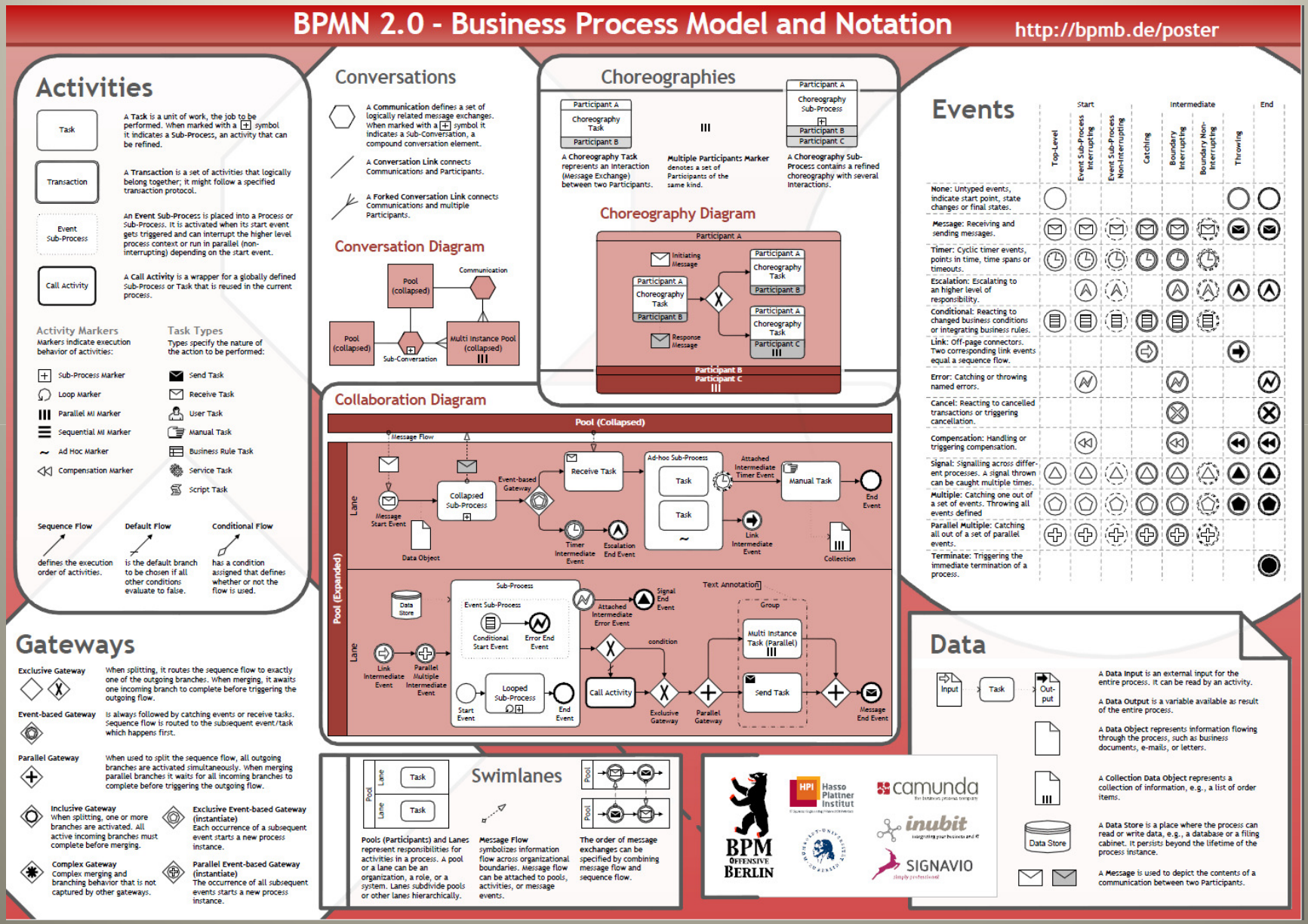
Crossing organizational borders



Commonality?

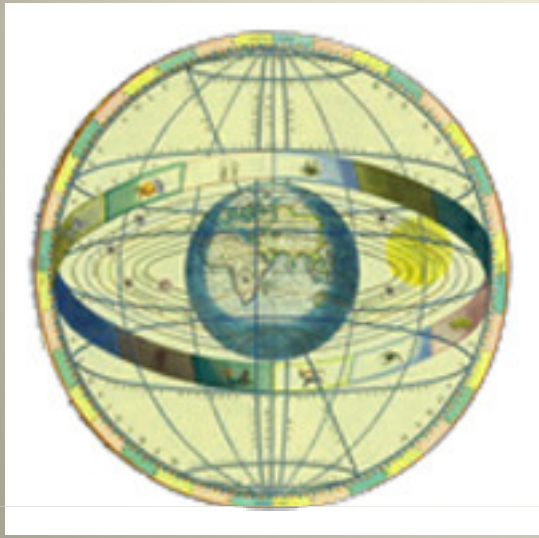


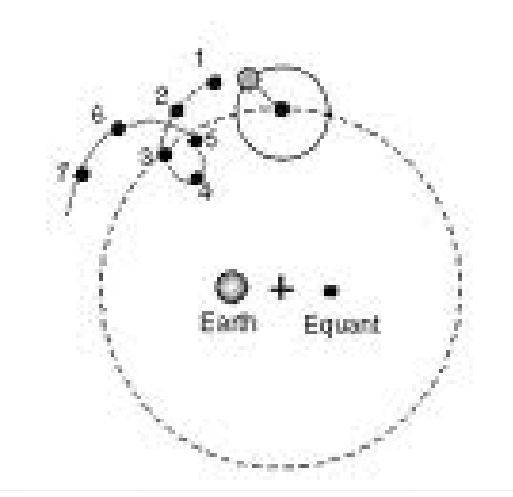
The significant problems we have cannot be solved at the same level of thinking with which we created them

– Albert Einstein

A paradigm shift needed

Paradigm shifts





Ptolemy: The earth at the center

Strange behavior!

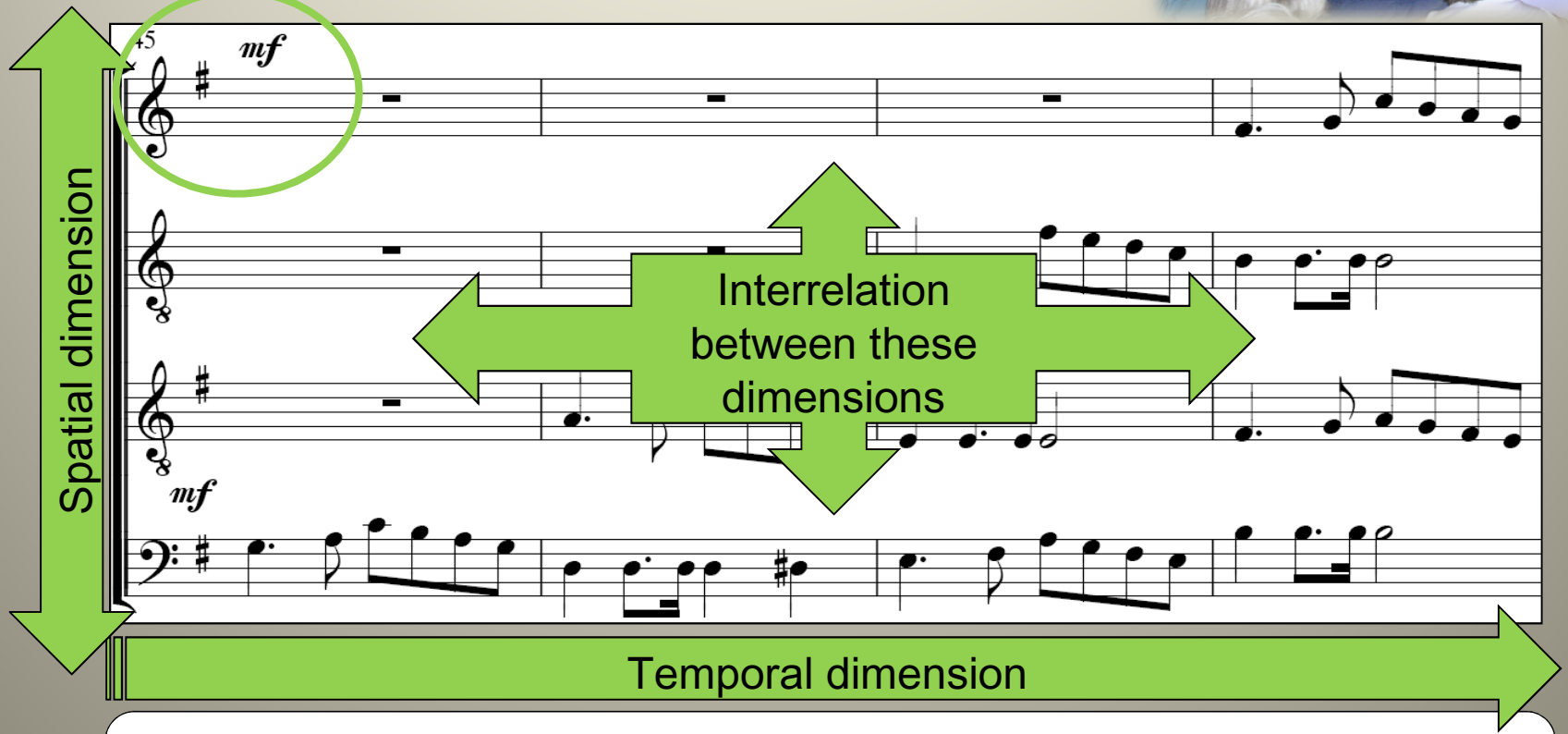
Copernicus: The sun at the center

Suddenly, everything familiar took
on a different interpretation!

Point of departure - socially organized work

Coordination of actions

Normative dimension



This notation system is 800+ years old!
It is plausible that it has evolved to fit human faculties

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Coordination between work contexts

A transitional dimension

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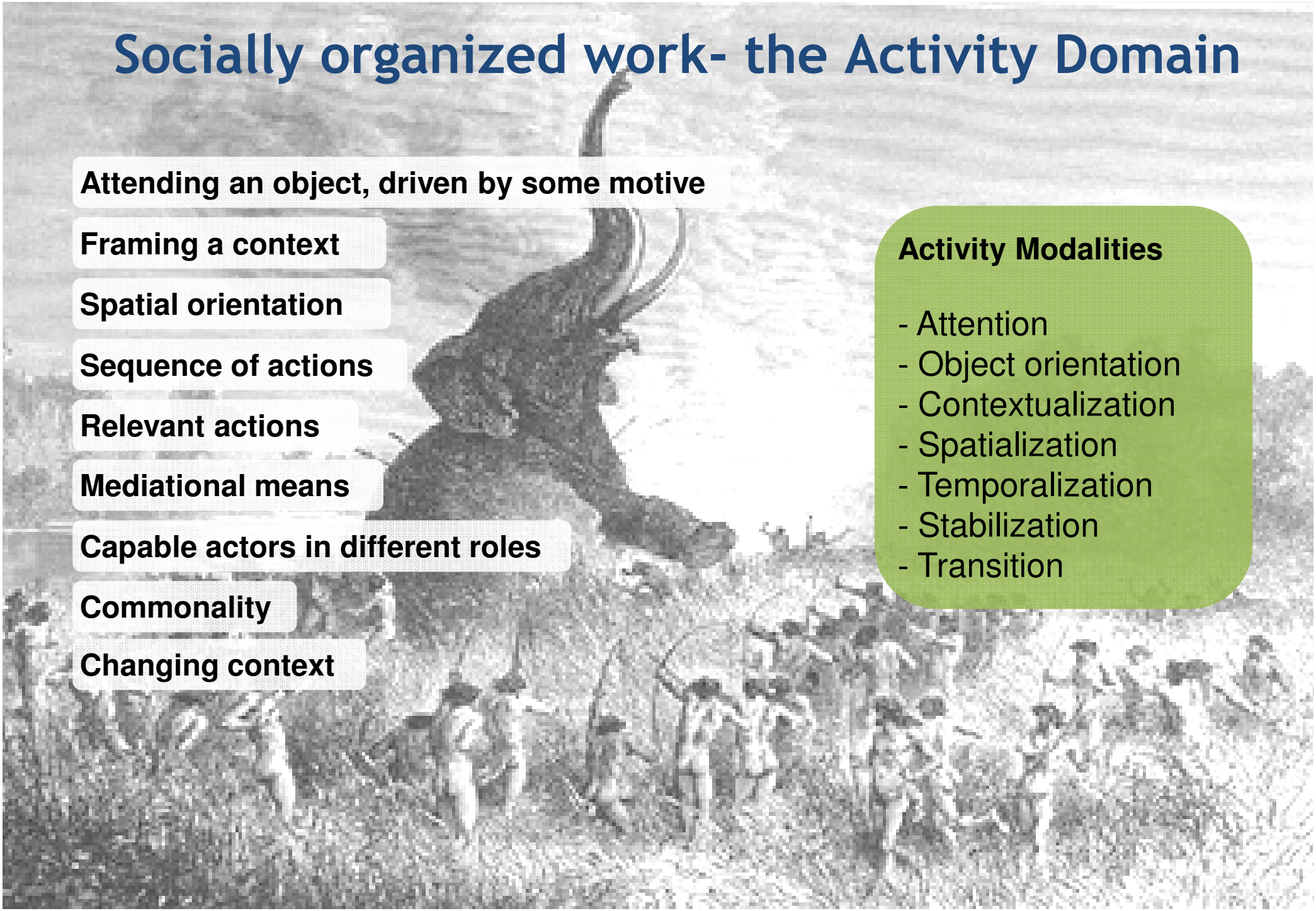
Socially organized work- the Activity Domain



Attending an object, driven by some motive

Framing a context

Spatial orientation

Sequence of actions

Relevant actions

Mediational means

Capable actors in different roles

Commonality

Changing context

Activity Modalities

- Attention
- Object orientation
- Contextualization
- Spatialization
- Temporalization
- Stabilization
- Transition

Enterprise management

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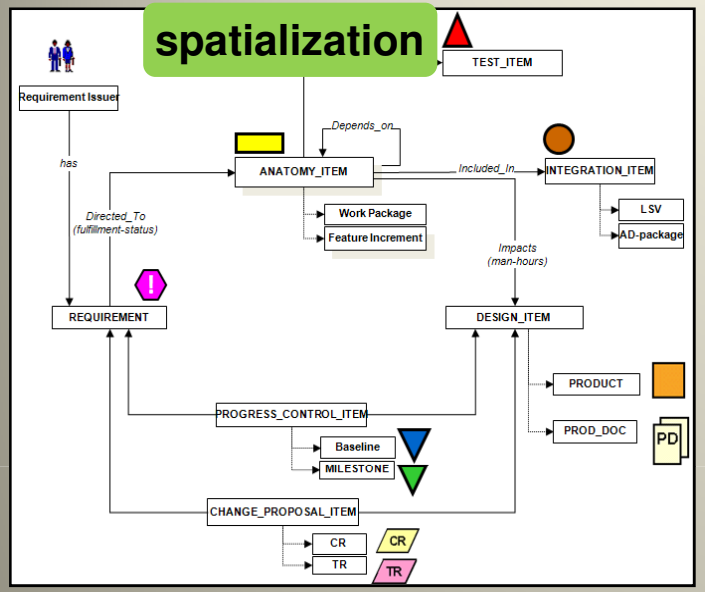
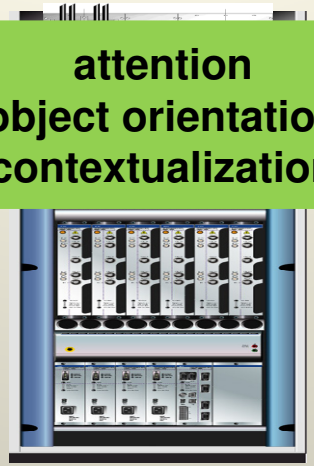
Information, data

spatialization



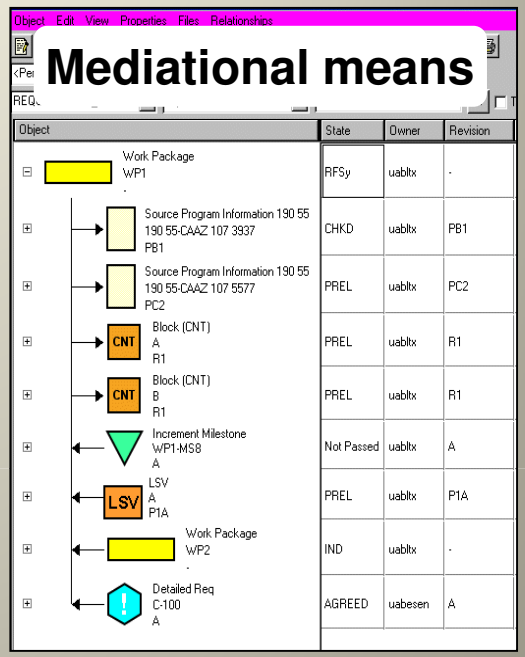
Products

attention
object orientation
contextualization



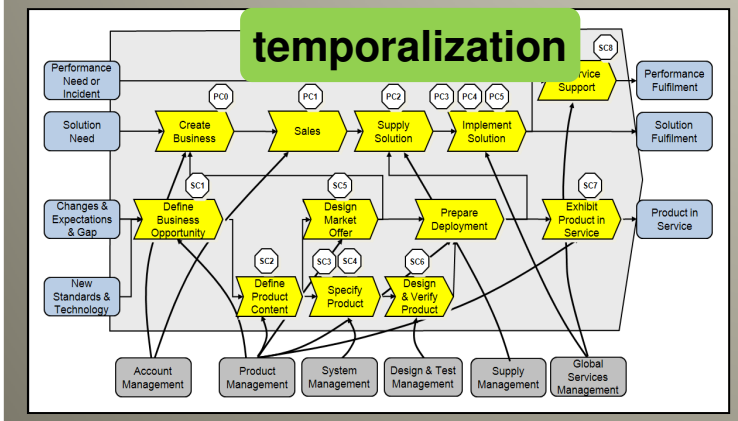
Enterprise systems

Mediational means



Processes

temporalization



Commonality
Capabilities

People

Business rules

stabilization

Collaboration

transition

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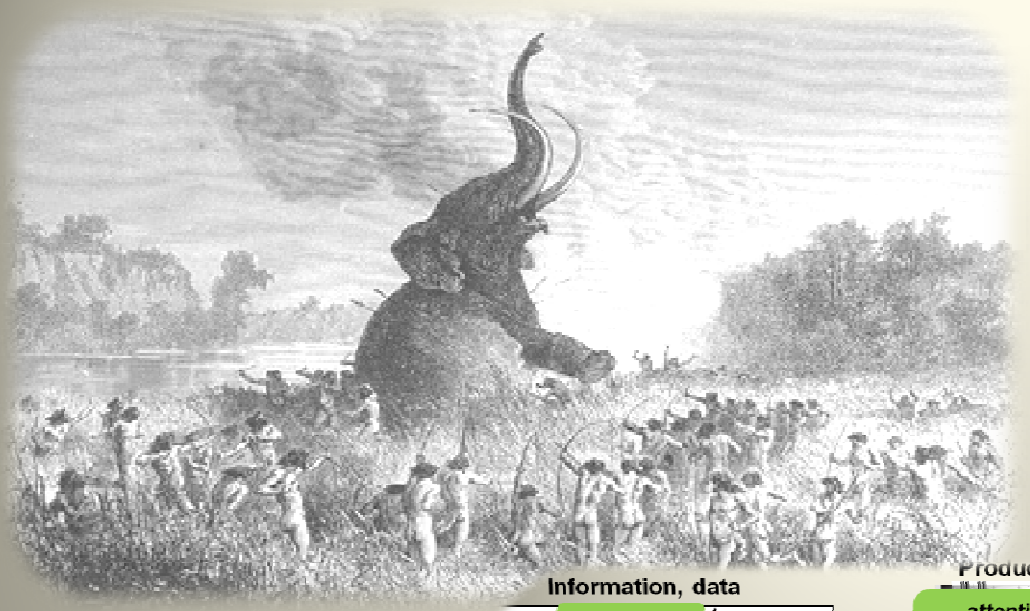
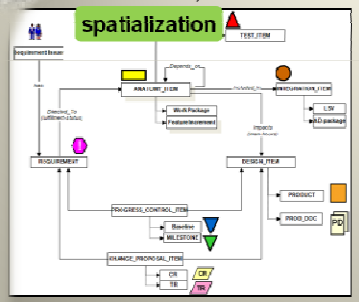


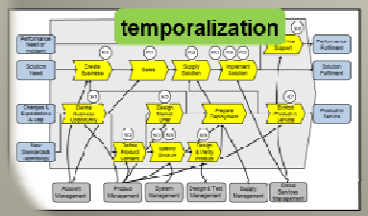
Information, data

spatialization



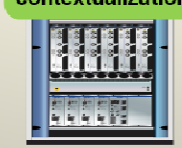
Processes

temporalization



Products

attention
object orientation
contextualization

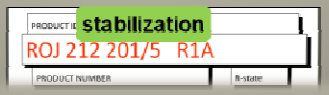


Commonality
Capabilities

People

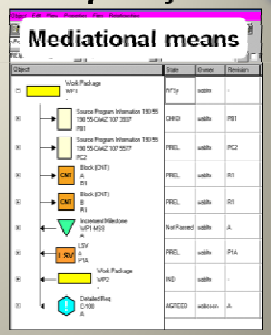
Business rules

stabilization



Enterprise systems

Mediational means



Collaboration

transition

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Same fundamental structure since historical times!

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Enterprise Modeling

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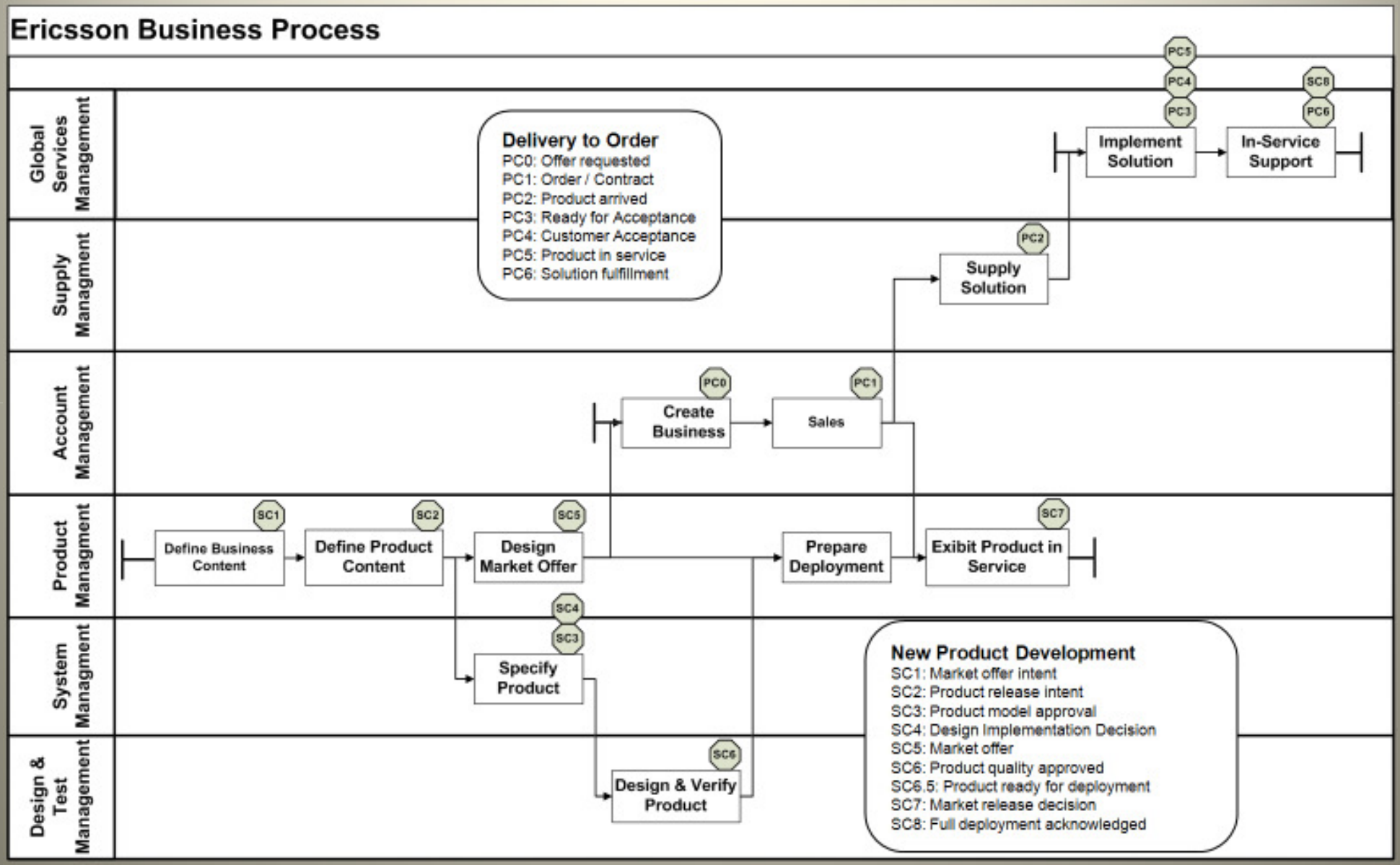
Traditional approach – business process modeling



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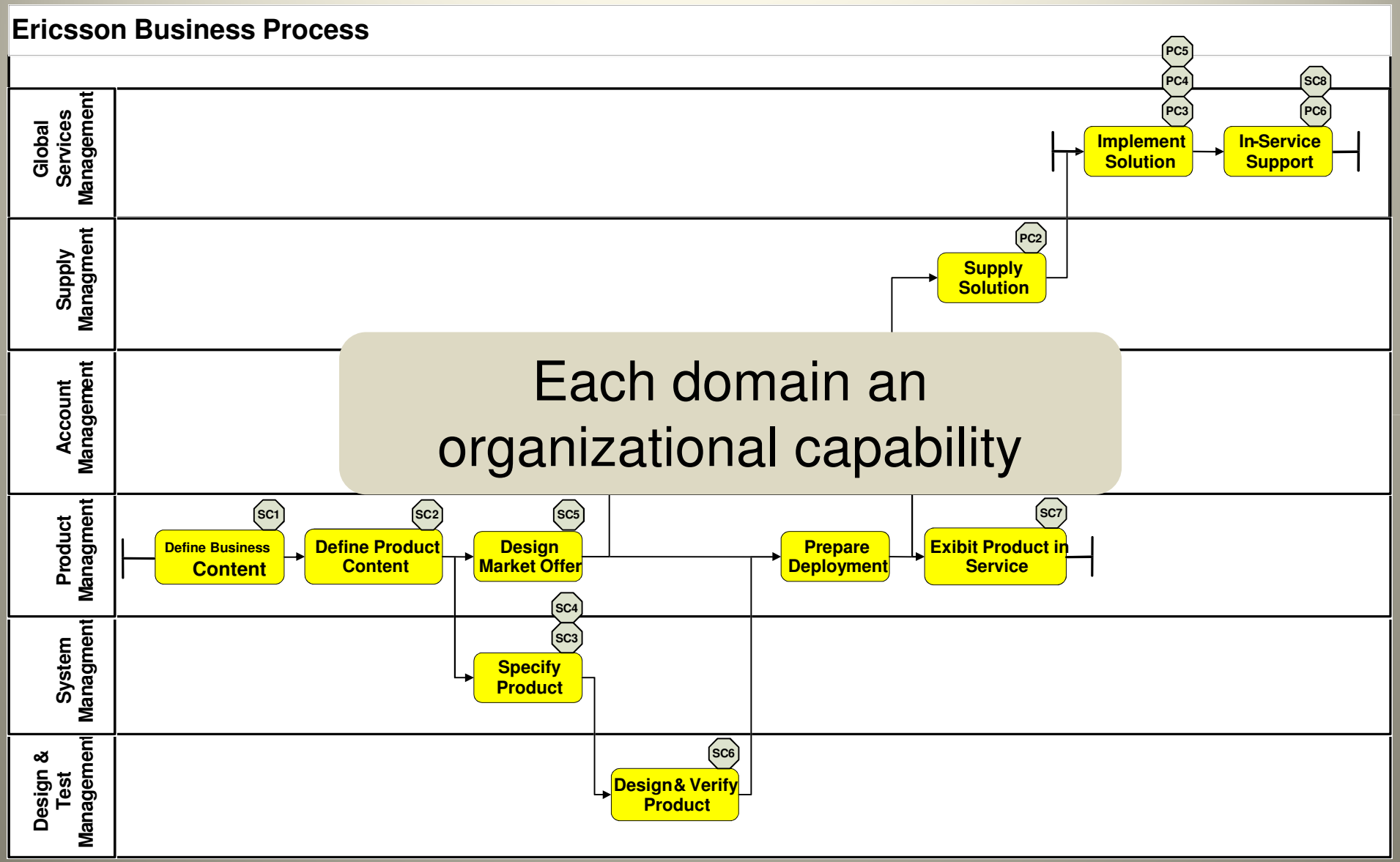
Paradigm shift – from activities to activity domains



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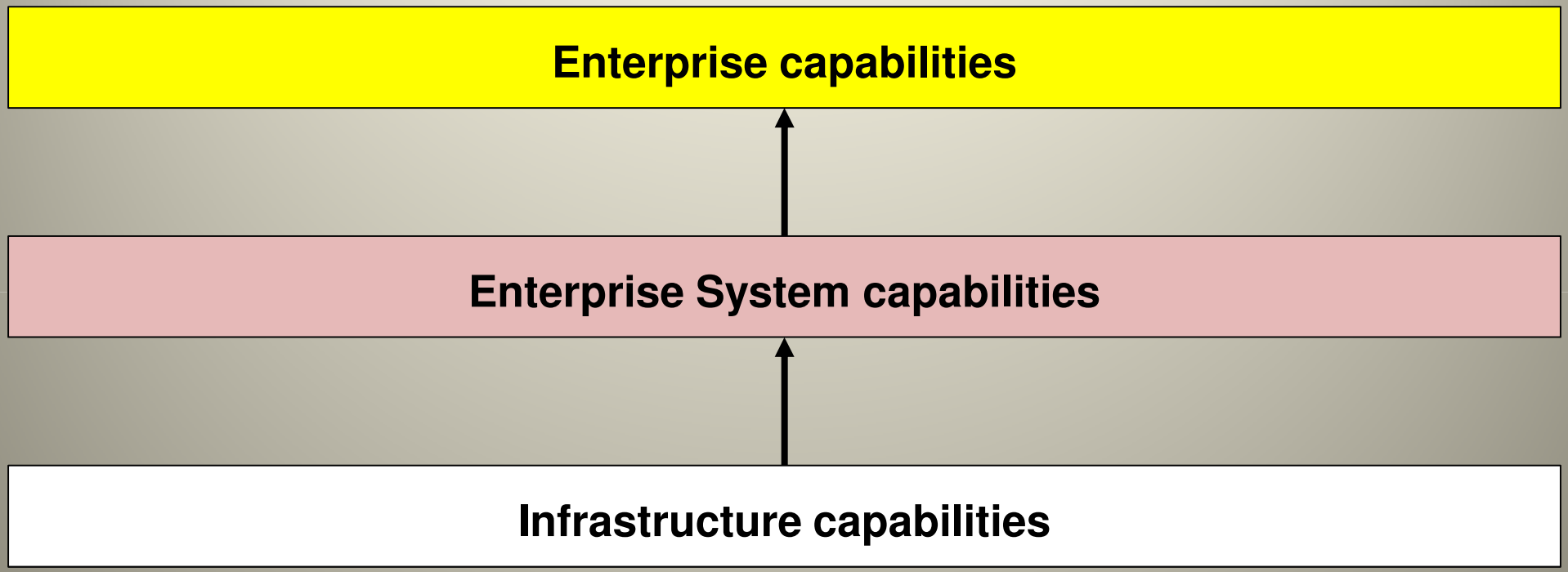
Capability perspective



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Anatomy

SW upgrade during traffic
Call path tracing
HW/SW info
Operation and Management
Traffic connection
DCH connection supervision
Softer handover
Soft handover
Start MMI
Hard handover
Element management platform
DCH Multi code
Multi DCH Radio link
Single DCH radio link
DCH Single code
Fast congestion control
Cell capacity supervision
Java execution platform
IP support
FACH/RACH connection
Fast power control
FACH Ack.
AAL5/IP packaging and encapsulating
DCH User data process
SMS broadcast
DCH Power control
RACH Transport
lub data stream setup/release
BCCH User data process
process
DCH Synchronization
BCCH Pow
wer control
DCH setup/release
BCCH setu
tup/release
AAL2 network connection control
Setup of RBS/RNC control link
Cell measurement report to RNC
Node synch.
RX diversion
SAAL layer
Cell processing setup/release
AAL2 layer
AAL5 layer
Resource auto configuration
Network synch. incl. Distr.
Node connection control
De-block HW (incl. Self test)
CMsupport
Scalable execution
SW key handling
System upgrade
Application SW load
FM support
Physical line termination
PM support
Distributed OS
LED handling
Local execution platform
Application hook
Power on

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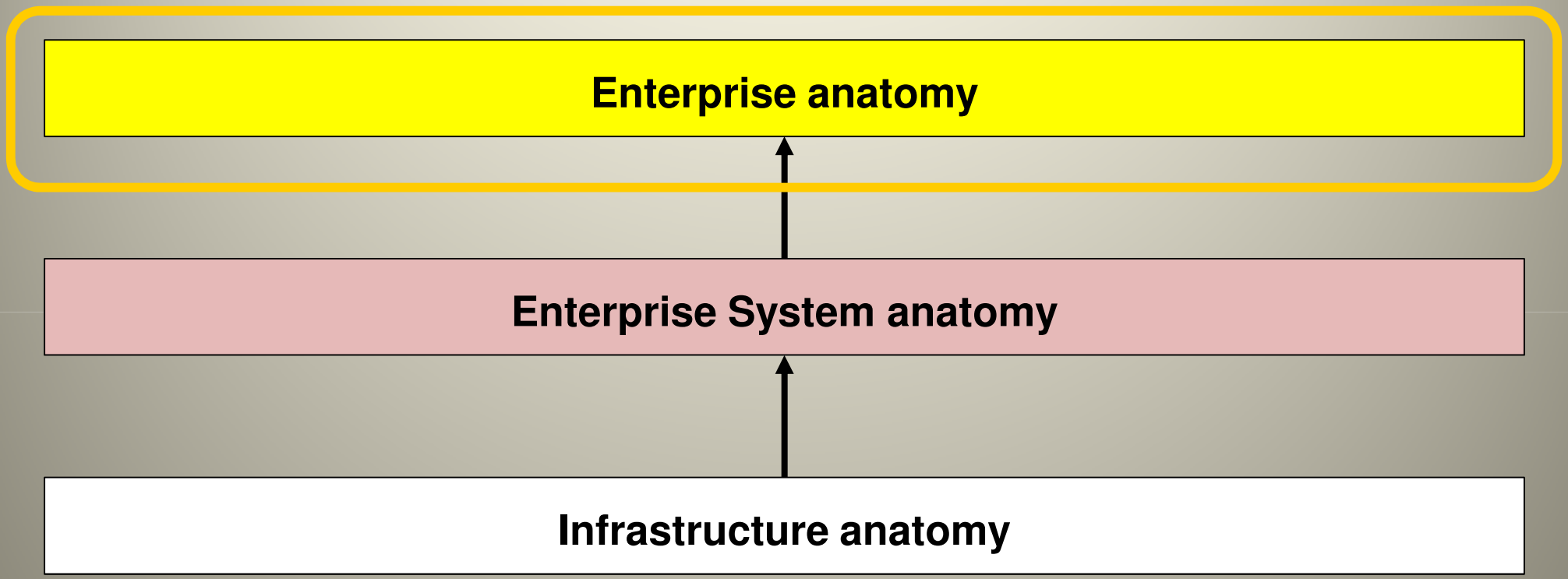
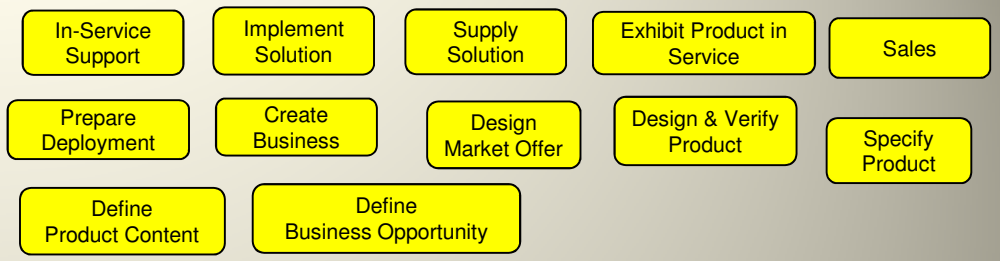
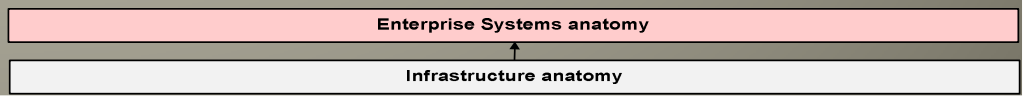
Uniform modeling – dependencies between capabilities



Enterprise anatomy

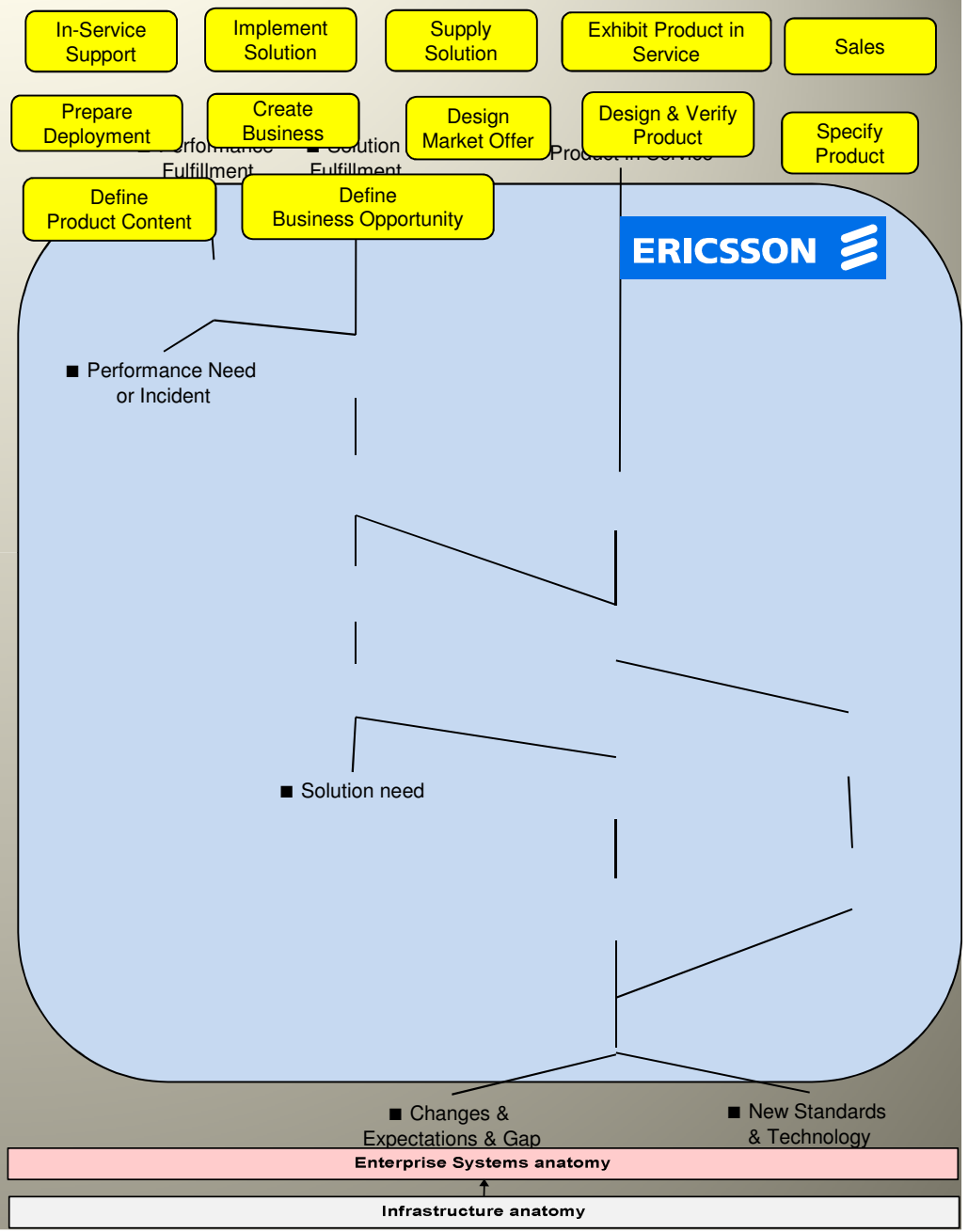
- **Activity Domains**
  - Object
  - Motive





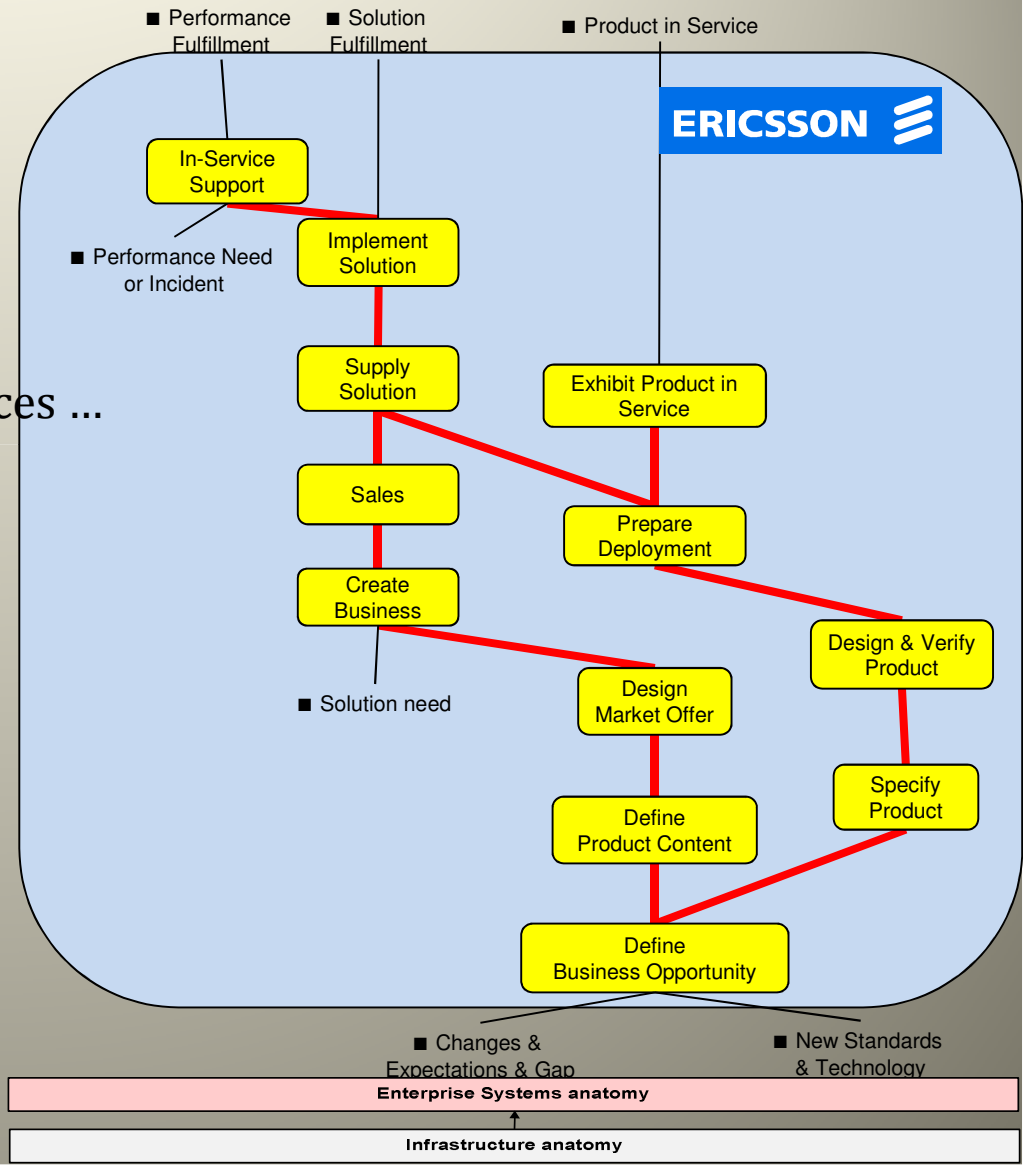
Enterprise anatomy

- **Activity Domains**
  - Object
  - Motive
- **Dependencies between domains**



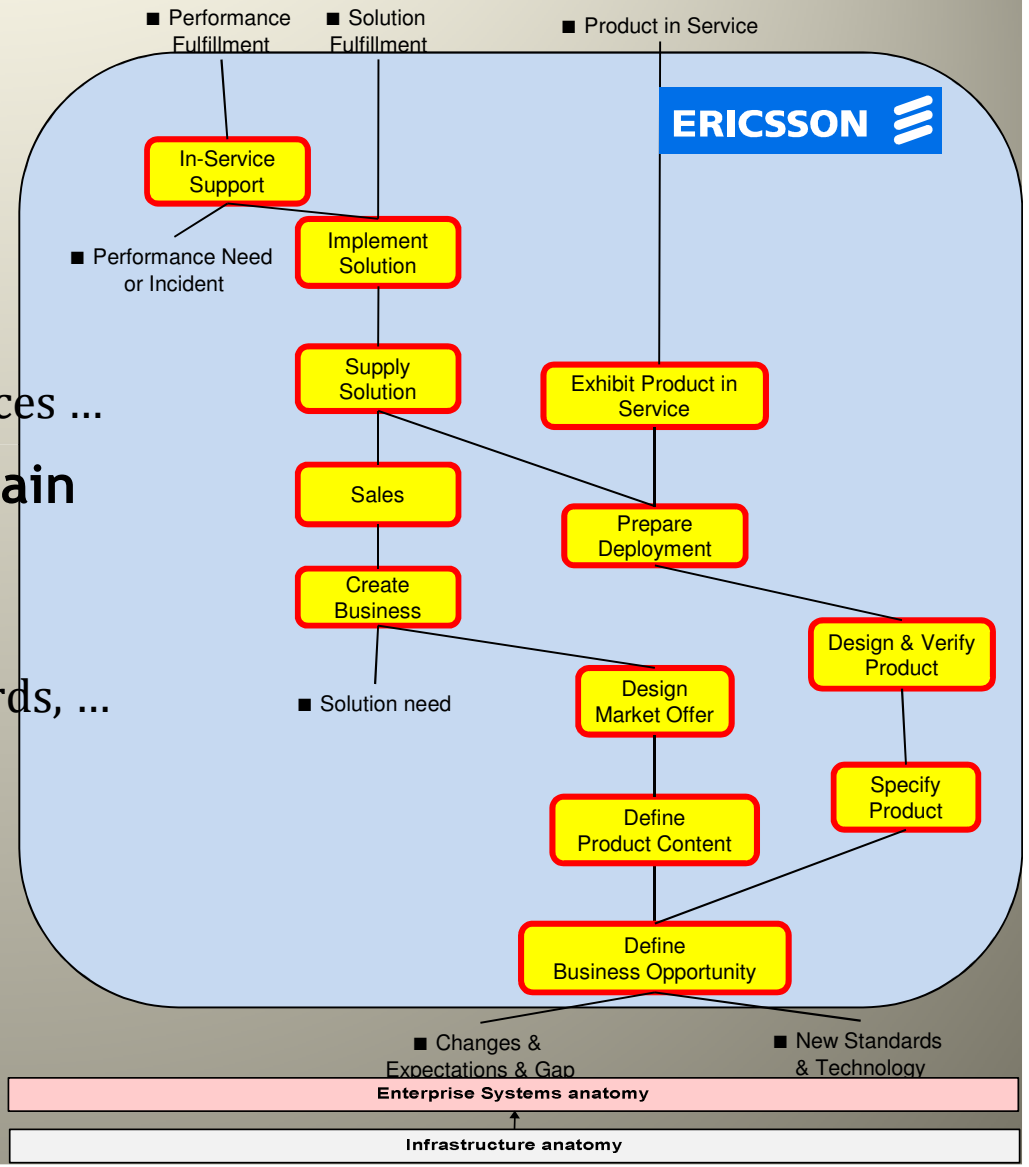
Enterprise anatomy

- **Activity Domains**
  - Object
  - Motive
- **Dependencies between domains**
- **Transitions between domains**
  - Mapping rules, translations, interfaces …



Enterprise anatomy

- **Activity Domains**
  - Object
  - Motive
- **Dependencies between domains**
- **Transitions between domains**
  - Mapping rules, translations, interfaces …
- **Activity modalities for each domain**
  - Data – Information Model
  - Actions – Process Models
  - Rules – business rules, standards, …
  - Systems – IS/IT, PLM, ERP, …



Enterprise System Implementation

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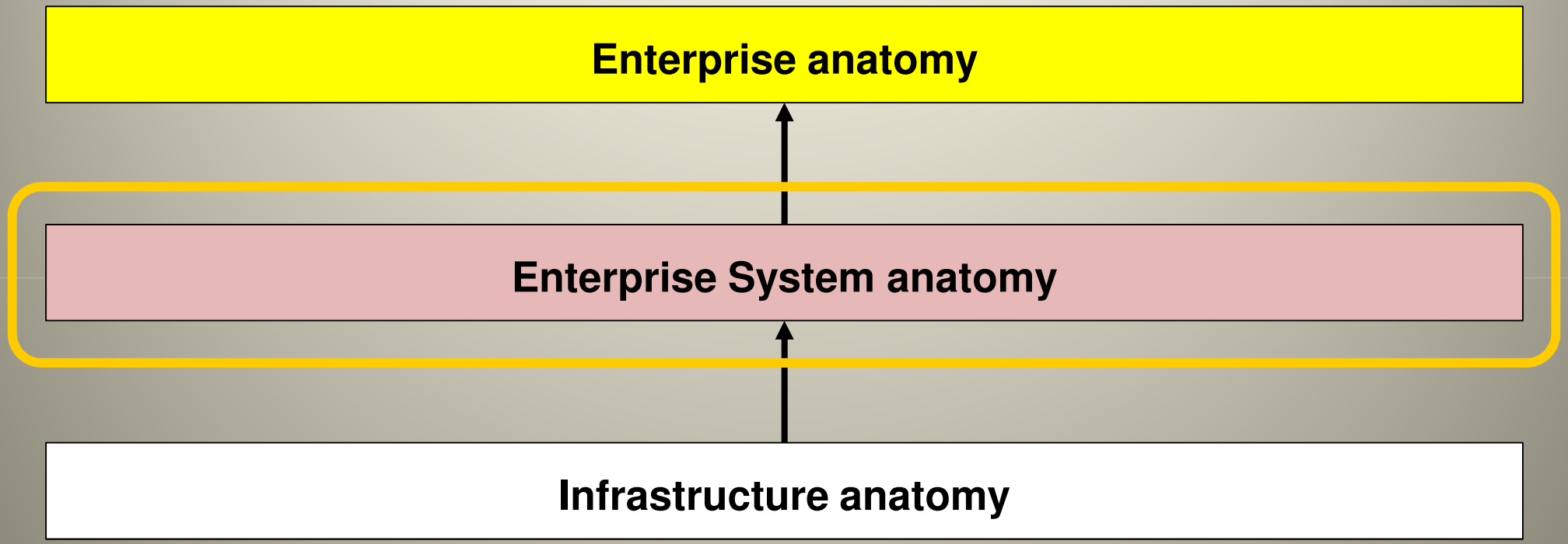
Uniform modeling – dependencies between capabilities



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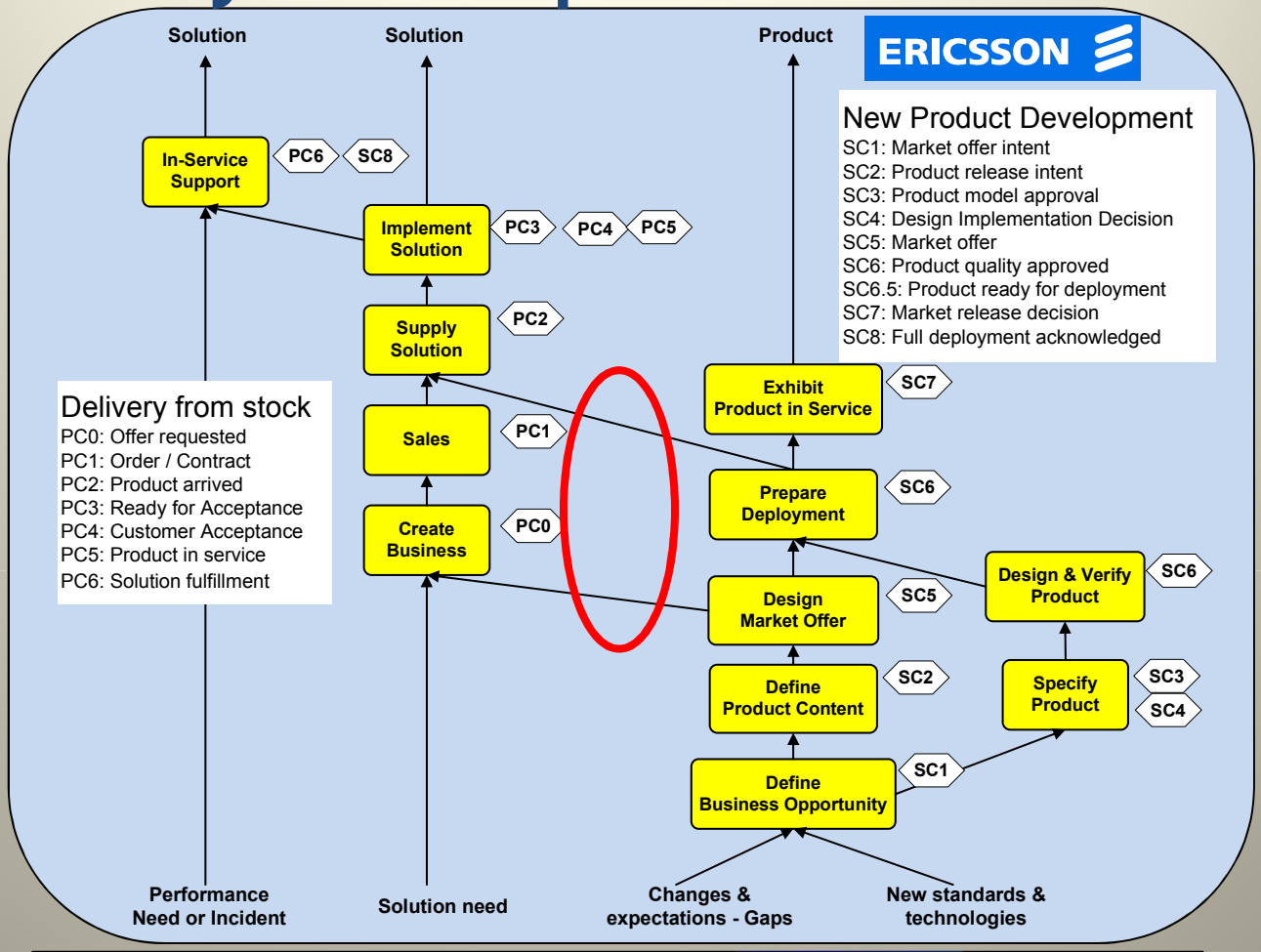
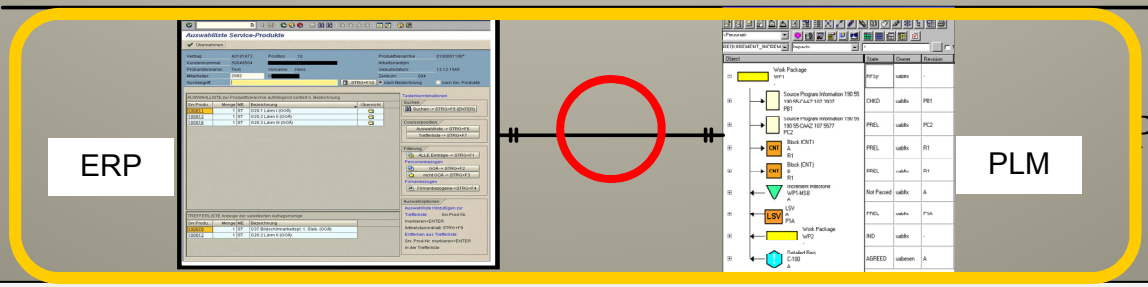
Enterprise System capabilities





Enterprise Resource Planning

Product Lifecycle Management

Infrastructure anatomy

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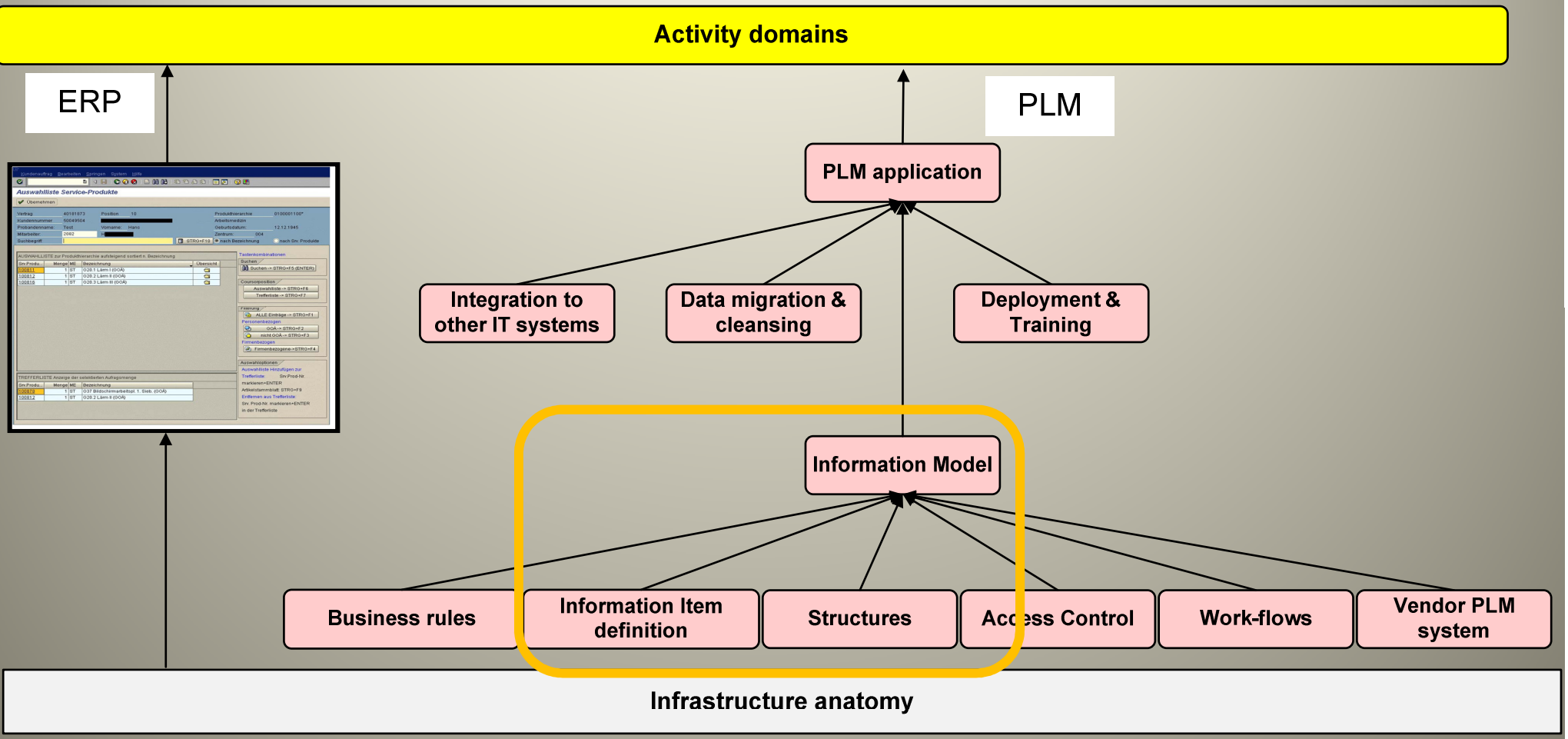
The Enterprise Systems anatomy (PLM)



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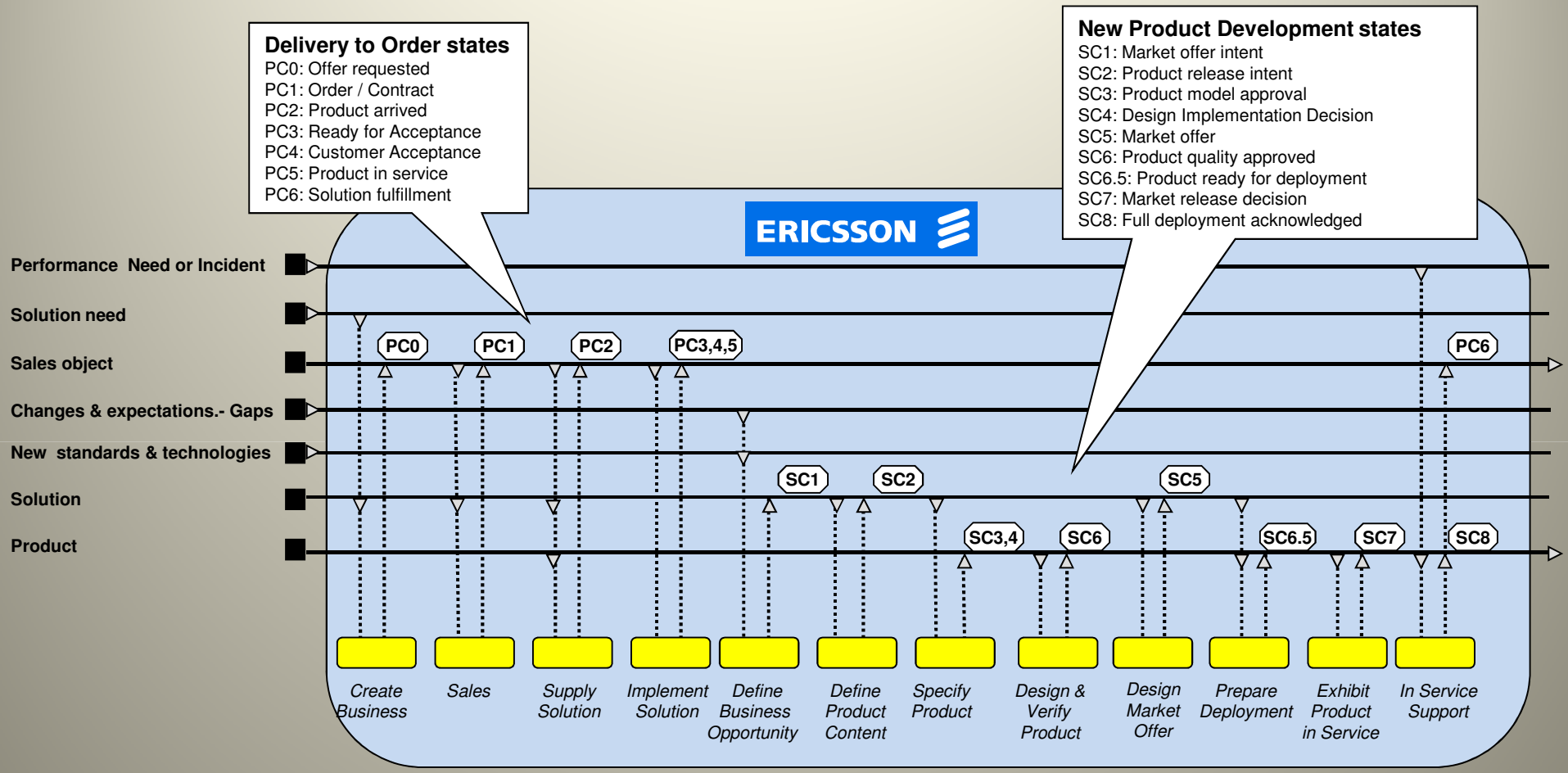
Dynamic view of information



Temporalization modality in focus

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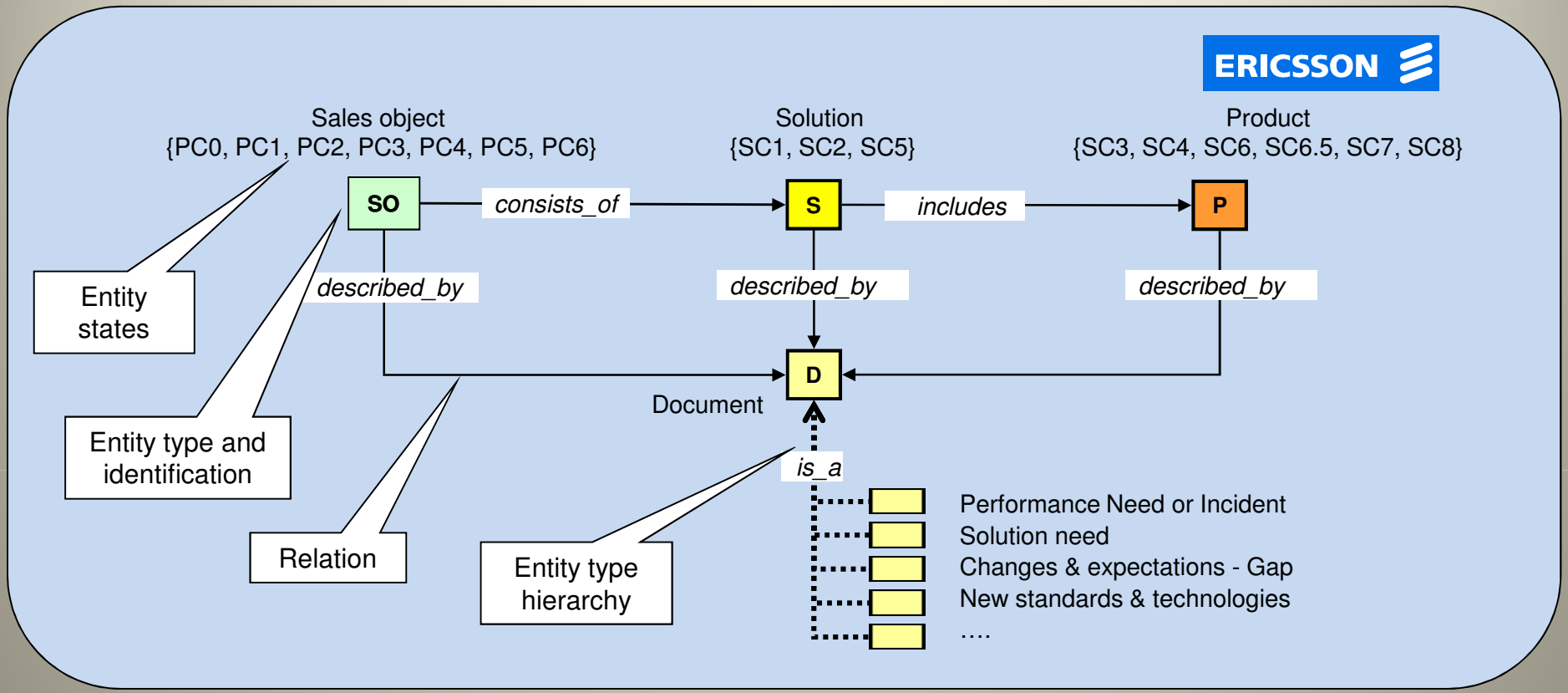
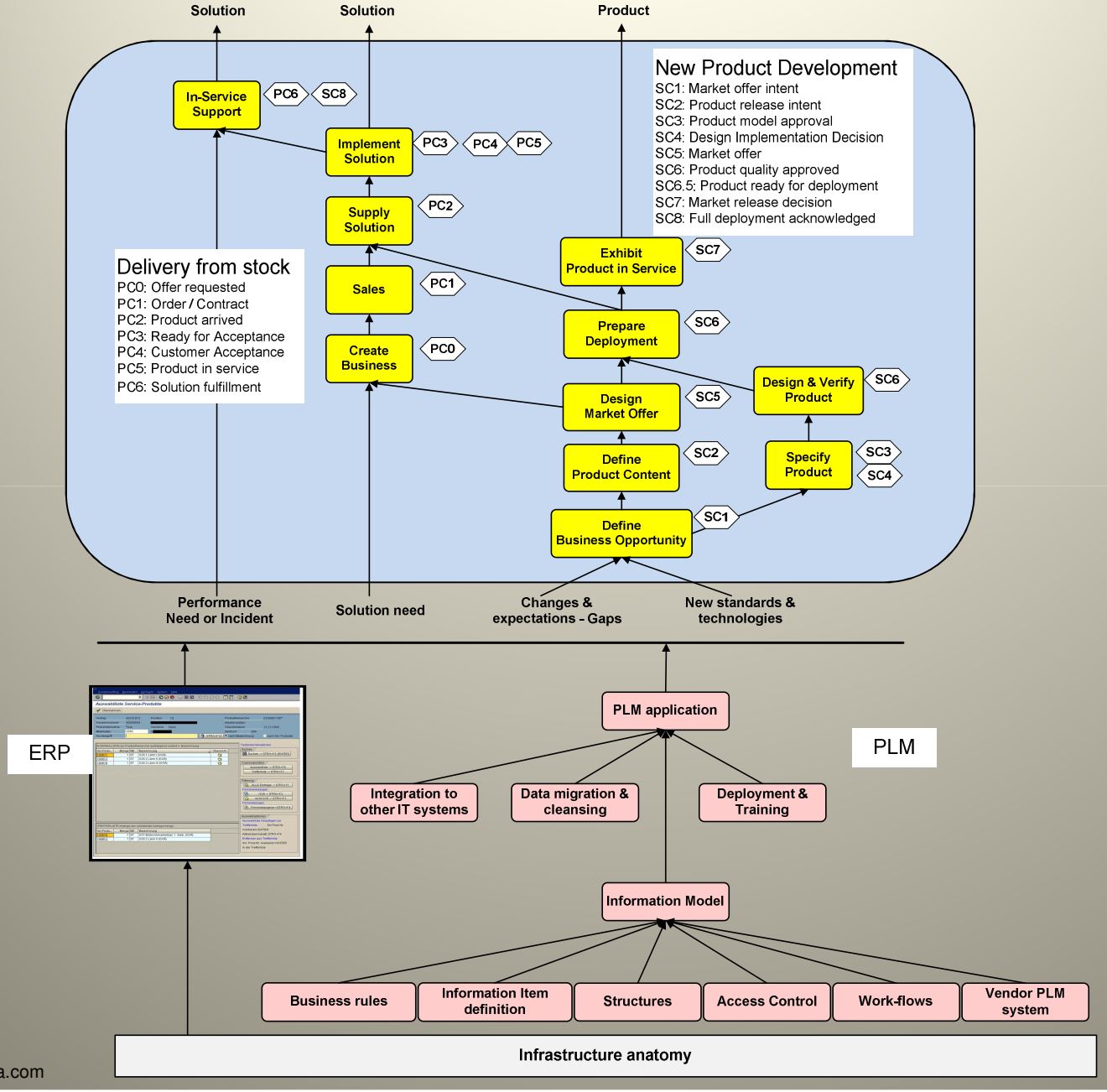
Static view of information



Spatialization modality in focus

Continue with other modalities

The overall anatomy



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Why bother?

Activity Domain

Activity in a process

- Constituted by motive and object
- Integrative perspective
  - Knowledge, information models, processes, rules, means, etc., internal to the domain
- All modalities considered
- Transition between domains
- Commonality

- Temporalization modality focus
- One-dimensional view
- Interdependencies between modalities may be ignored
- Commonality may be ignored

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The message

- **Business process modeling inadequate**
  - Captures only one dimension of a multi-dimensional complex
- **Our biological prerequisites must be acknowledged**
  - The activity modalities
- **Achieving commonality a foremost issue**
  - Anatomy - simple, yet powerful model
- **EA modeling approaches must be practical**
  - Model organizations and Enterprise Systems from the same perspective
- **The activity domain suggested as an alternative approach**