Centro de Investigación en Métodos de Producción de Software

The Need of Requirements Engineering for Achieving Success in MDD

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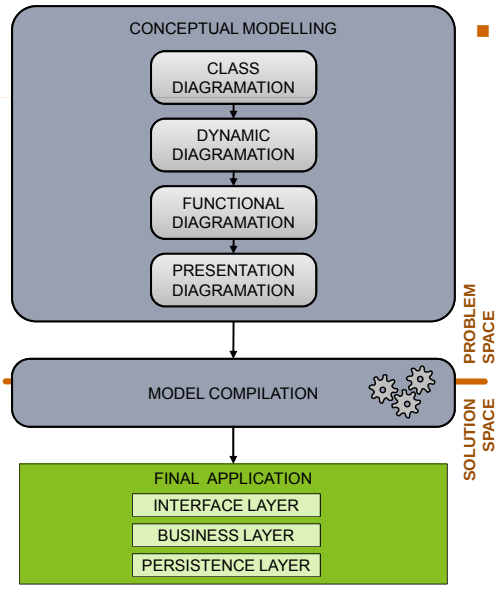
OLIVANOVA



- The OLIVANOVA approach:
  - Conceptual modelling
    - Object Model
    - Dynamic Model
    - Functional Model
    - Presentation Model
  - Model compilation

3

The method
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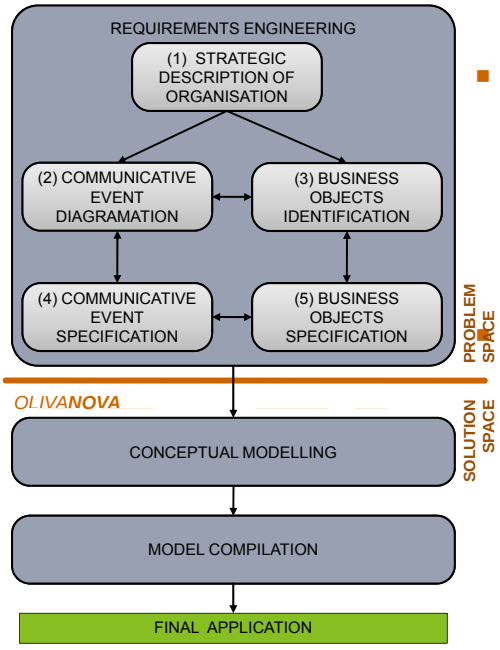
Communication Analysis



- Communication Analysis:
  - Requirements engineering approach for information systems
  - Provides a **requirements structure**
  - Provides a **flow of activities**

- The OLIVANOVA approach:
  - Conceptual modelling
    - Object Model
    - Dynamic Model
    - Functional Model
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  - Model compilation

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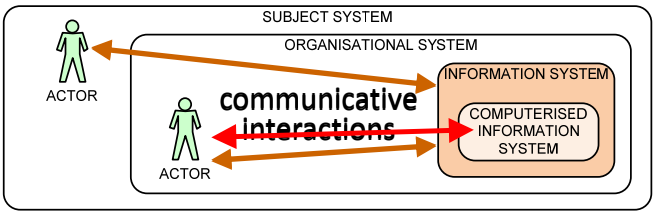
Motivation

- Good practices in IS requirements Engineering:
  - Offer external view of the IS.
  - **A communicational approach to IS analysis.**

requirements specification



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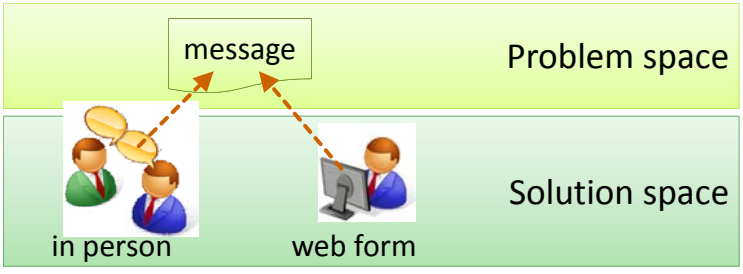
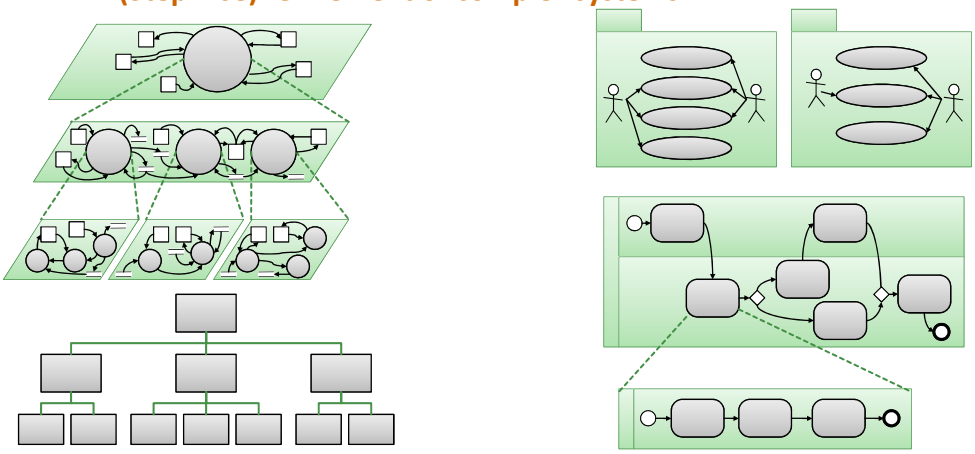
- Good practices in IS requirements Engineering:
  - Offer external view of the IS.
  - A communicational approach to IS analysis.
  - **Differentiate problem space vs. solution space.**



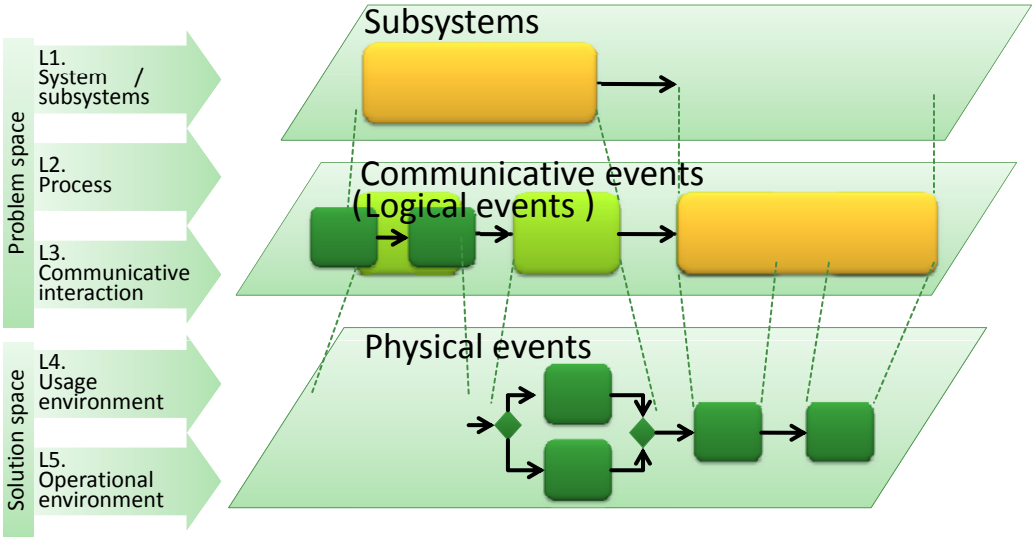
Motivation

- Good practices in IS requirements Engineering:
  - Offer external view of the IS.
  - A communicational approach to IS analysis.
  - Differentiate problem space vs. solution space.
  - **(Stepwise) refinement of complex systems.**



Motivation

- **Wise** (stepwise) refinement of complex systems



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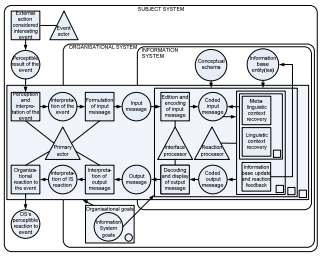
- Conception of Communication Analysis
  - Stems from research on IS fundamental concepts
    - Extension of the FRISCO report.



  - Evolves in collaboration with industry
    - Valencia Port Authority
    - Infrastructure and Transport Ministry of the Valencian Regional Government
    - Anecoop S. Coop. (2nd grade cooperative that aggregates +100 agricultural cooperatives)

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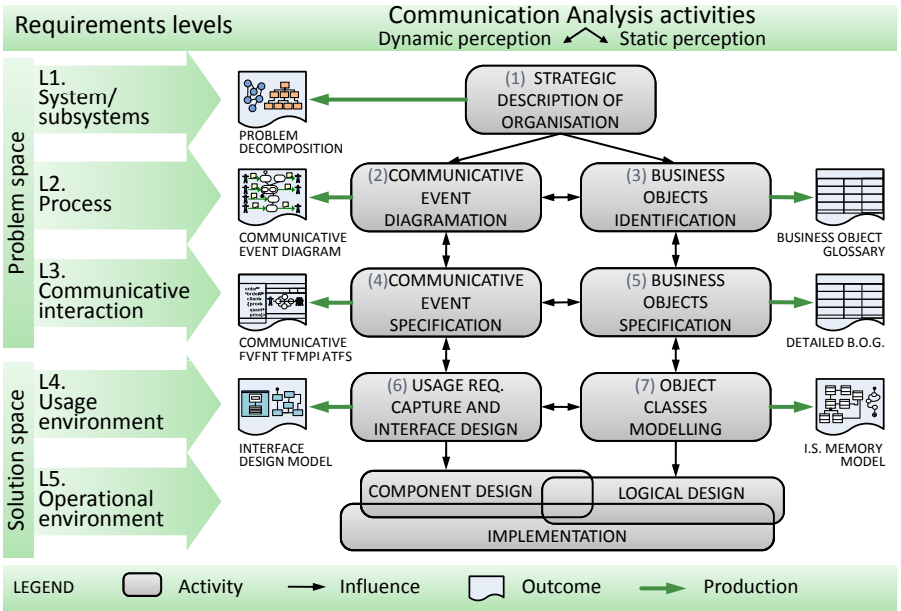
- Requirements structure and method activities



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- Activity 1. Strategic description of organisation.

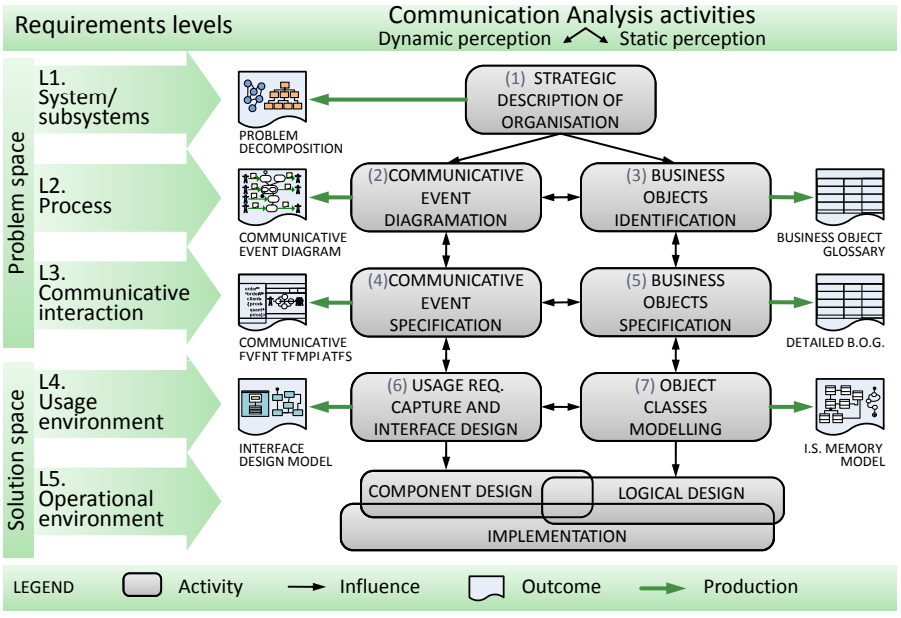
Problem space
- L1. System/ subsystems
- L2. Process
- L3. Communicative interaction

Solution space
- L4. Usage environment
- L5. Operational environment

- Describe the Organisational System from a strategic p.o.v
- Decompose the problem
  - Customer Service Departments (salesmen)
  - Production Department (clerks)
  - Accounting Department (accountant)
  - Management Board
- Strategic business indicators
  - Increase in the number of photographers
  - Increase in the number of exclusives
  - Cash flow
  - etc.

Proposal

- Requirements structure and method activities



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- Activity 2. Communicative event diagramation

Problem space
- L1. System/ subsystems
- L2. Process
- L3. Communicative interaction

Solution space
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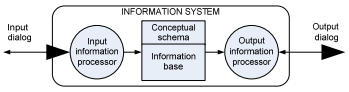
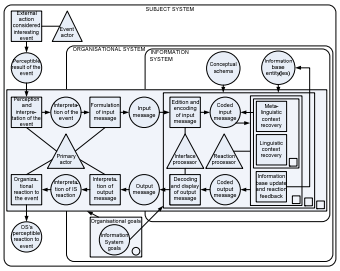
- **Communicative interaction**. Interaction between actors in order to exchange information.
  - **Ingoing communicative interaction** primarily feed the IS memory with new meaningful information.
  - **Outgoing communicative interaction** primarily consult IS memory.
- **Communicative event**. An ingoing communicative interaction that fulfils the following unity criteria.



[ISO 1982]



Extended from [FRISCO 1998]

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- **Communicative event**. An ingoing communicative interaction that fulfils the following unity criteria.

UNITY CRITERIA FOR BUSINESS PROCESS MODELLING	
TRIGGER UNITY	Trigger responsibility is external. The event occurs as a response to an **external interaction.** Some actor establishes contact with the IS and triggers organisational reaction.
COMMUNICATION UNITY	Each and every event involves providing **new meaningful information**. Input messages are representations of something that happens in the IS environment.
REACTION UNITY	The event triggers IS reaction, which is **a composition of synchronous activities**. Events are asynchronous among each other.

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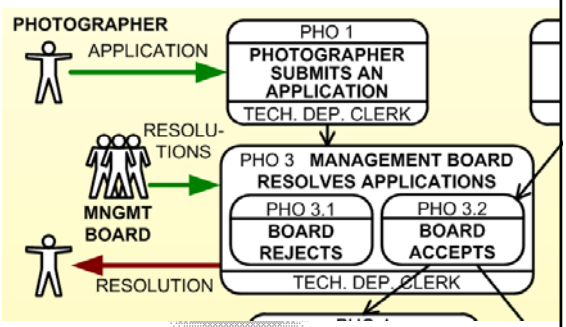
- Illustrative example

Photographer

Photography Agency, Inc



- Communicative event diagram of *Photography Agency, Inc.*

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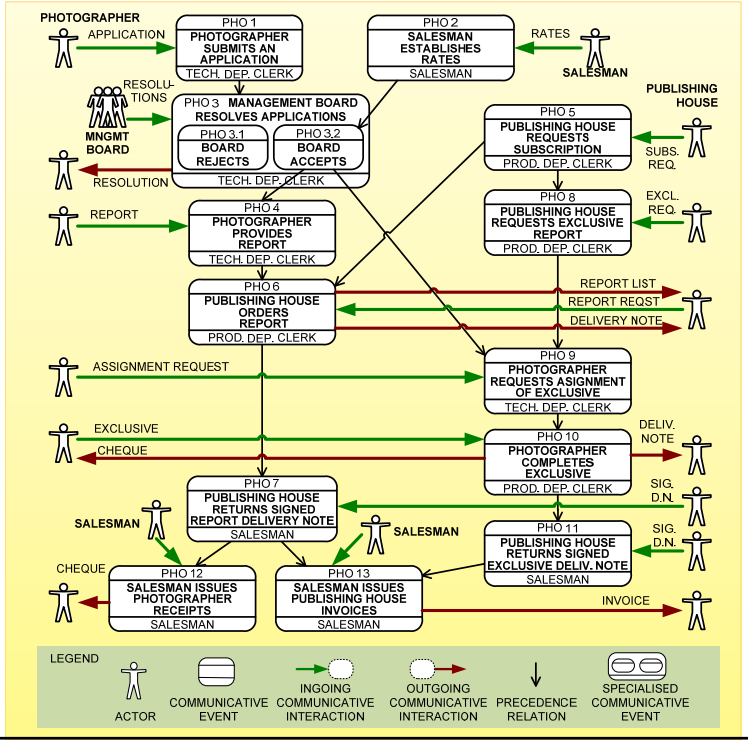

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- Activity 3. Business objects identification.
  - **Business Object Glossary**. Structure that specifies business objects.
    - Business objects are conceptions of entities of the Subject System in which the Organisational System is interested.
      - Complex aggregates of properties (not o-o fragmentation)

        • Report record
        • Photographer record
        • Report delivery note
    - Business forms are catalogued.
  - Business indicators at the process level.

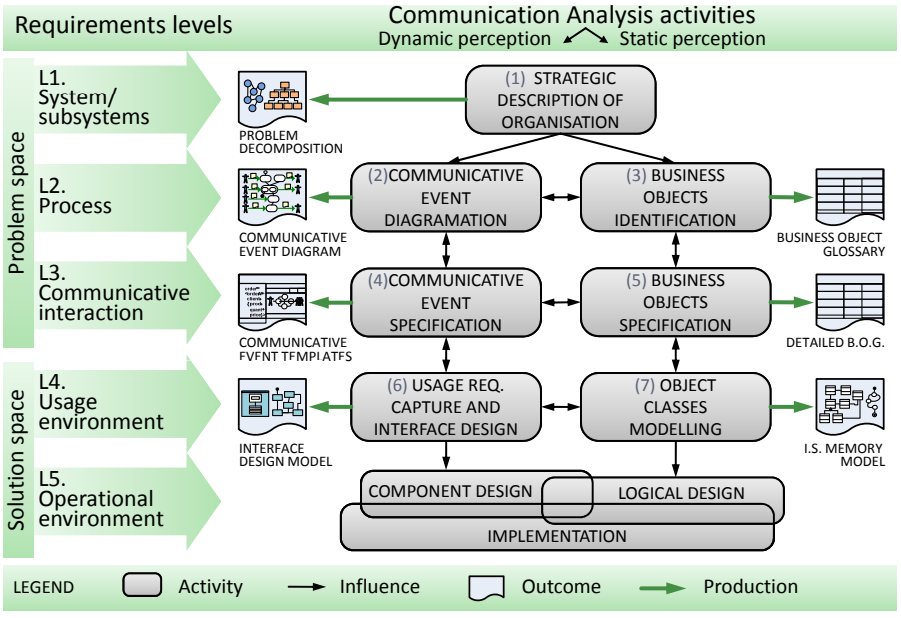
    •Production department: productivity and profitability indicators
    • Delivery performance to customer
    • Photographer productivity

Problem space: L1. System/ subsystems; L2. Process; L3. Communicative interaction

Solution space: L4. Usage environment; L5. Operational environment

Proposal

- Requirements structure and method activities



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- Activity 4. Communicative event specification.
  - Template structure

Header
Contact requirements
Communicational content requirements
Reaction requirements

Problem space
- L1. System/ subsystems
- L2. Process
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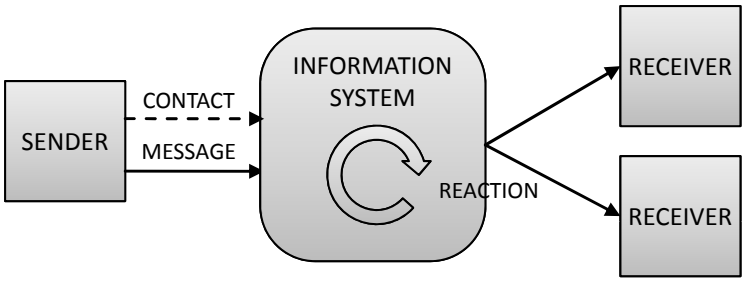

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PHO 3. Management board resolves applications

Goals: The IS aims to obtain a response to outstanding photographer applications.

Description: Monday mornings, the management board holds a meeting. A member of each department is present. A Production Department clerk has prepared a list of outstanding (pending) photographer applications and a résumé of each applicant. Management board proceeds to evaluate and resolve each application. Depending on the documentation, a photographer is either accepted or rejected. Accepted photographers are classified into a quality level (this level will determine their rates). After the meeting, the list of resolved applications is returned to Production Department.

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- Activity 4

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Contact requirements
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Problem space
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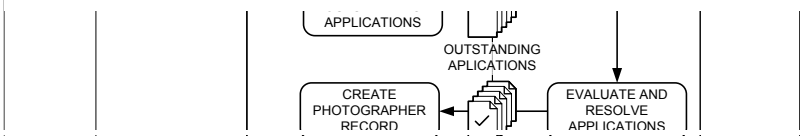

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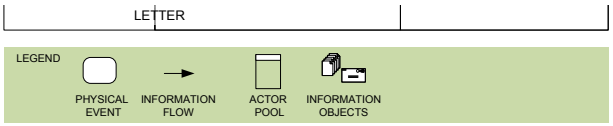

Contact requirements

Primary actor: Management board. **Communication channel**: In person.
Temporal restrictions: This communicative event occurs Monday mornings.
Frequency: Of the 10-20 monthly applications, around 5 are accepted.

Communicational content requirements

Support actor: Production Department clerk
Communication Structure:

FIELD	OP	DOMAIN	BUSINESS OBJ.	EXAMPLE VALUE

LEGEND

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- Activity 4. Communicative event specification.
  - Communication Structure of event PHO 3

Header
Contact requirements
Communicational content requirements
Reaction requirements

FIELD	OP	DOMAIN	BUSINESS OBJ.	EXAMPLE VALUE
RESOLUTIONS =			PHOTOGRAPHER	
{ Application()=			(ID card #)=	
< ID card # +	i	text	<	19.345.631-Q
Name +	d	text		Sergio Pastor González
Address +	d	text		Camino de Vera s/n
Postcode +	d	text		46022
City +	d	text		Valencia
Phone # +	d	text		9638700000 ext 83534
Equipment +	d	text		Canon A1 w. telemacro
Experience +	d	text		Worked for Mangum Ph
Portfolio +	d	document		N/A (sample of work)
Resol. date +	i	date	resol date +	November 21, 2008
Decision +	i	[acc|rej]	decision +	acc
[Accepted =		Decision=acc		
< Level >]	i	Rate<level>	level	1 (highest quality level)
>			>	
}				

LEGEND

CSs Primitives

<+> aggregation
{ } iteration
[|] alternative
( ) selection

Information aquisition operations

d derivation
i input

Proposal

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- Activity 4

Header
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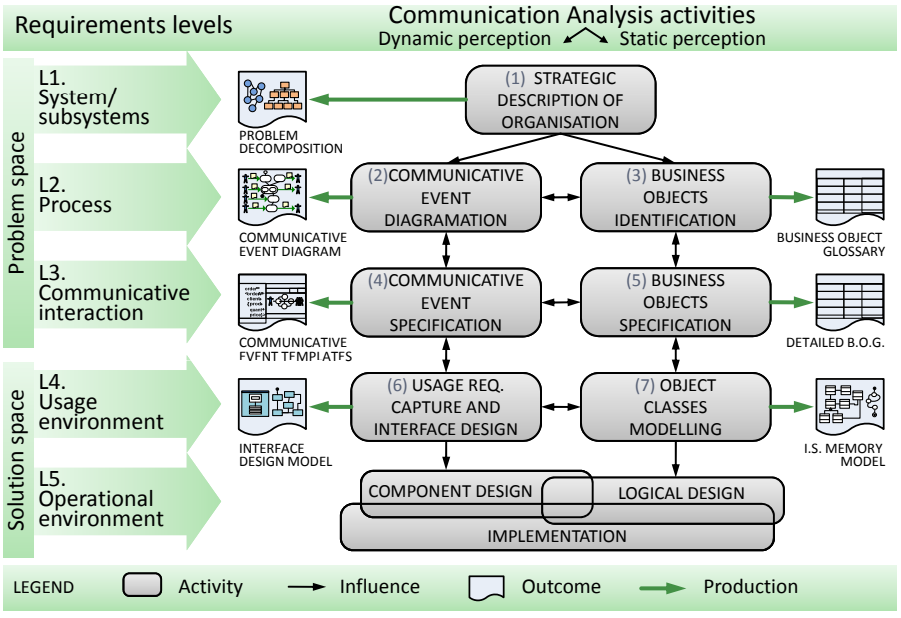
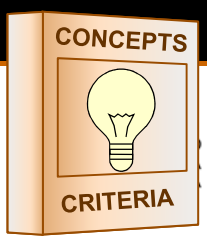


Conclusions and future work

- Communication Analysis offers a systemic way to structure requirements
- Specific techniques for IS analysis
  - Communicative Event Diagram.
    - Communicational perspective on business process modelling
    - Unity criteria to deal with encapsulation (granularity of processes)
  - Communication Structures
    - Specifies messages related to communicative events
    - Derivation of IS memory from communication structures
- Future work
  - Propose precise guidelines to derive IS memory
  - Design user interface from communication structures
  - Report industrial case studies in the use of Communication Analysis
  - Take advantage of MDD and code generation frameworks
  - Extremely long etcetera (I hope)

Thanks for your attention!



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