The Need of Requirements Engineering for Achieving Success in MDD

Óscar Pastor López
The OLIVANOVA approach:

- Conceptual modelling
  - Object Model
  - Dynamic Model
  - Functional Model
  - Presentation Model
- Model compilation

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
  - Presentation Model
- Model compilation
Good practices in IS requirements Engineering:

- Offer external view of the IS.
- A communicational approach to IS analysis.
- Differentiate problem space vs. solution space.
- 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.

- Wise (stepwise) refinement of complex systems

L1. System / subsystems
L2. Process
L3. Communicative interaction
L4. Usage environment
L5. Operational environment
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)

Requirements structure and method activities
## Activity 1. Strategic description of organisation.

- 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.

### Requirements structure and method activities

**Requirements levels**

- L1. System/subsystems
- L2. Process
- L3. Communicative interaction
- L4. Usage environment
- L5. Operational environment

**Communication Analysis activities**

- Dynamic perception
- Static perception

- (1) STRATEGIC DESCRIPTION OF ORGANISATION
- (2) COMMUNICATIVE EVENT DIAGRAM
- (3) BUSINESS OBJECTS IDENTIFICATION
- (4) COMMUNICATIVE EVENT SPECIFICATION
- (5) BUSINESS OBJECTS SPECIFICATION
- (6) USAGE REQ., CAPTURE AND INTERFACE DESIGN
- (7) OBJECT CLASSES MODELLING

**Implementation**

- COMPONENT DESIGN
- LOGICAL DESIGN
Activity 2. Communicative event diagramation

- **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.
Illustrative example

Photographer
Photography Agency, Inc

Communicative event diagram of Photography Agency, Inc.

### 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)
- Business forms are catalogued.

### Business indicators at the process level.
- Production department: productivity and profitability indicators
  - Delivery performance to customer
  - Photographer productivity

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### Requirements structure and method activities

<table>
<thead>
<tr>
<th>Requirements levels</th>
<th>Communication Analysis activities</th>
<th>Dynamic perception</th>
<th>Static perception</th>
</tr>
</thead>
<tbody>
<tr>
<td>L1. System/subsystems</td>
<td>PROBLEM DECOMPOSITION</td>
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<td>L2. Process</td>
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<td>L4. Usage environment</td>
<td>USAGE REQUIREMENTS Interface Design</td>
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<td>L5. Operational environment</td>
<td>OBJECT CLASSES MODELLING</td>
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<tr>
<td></td>
<td>IMPLEMENTATION</td>
<td></td>
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</tr>
</tbody>
</table>

**Legend:**
- Activity
- Influence
- Outcome
- Production

- Template structure

```
<table>
<thead>
<tr>
<th>L1. System/ subsystems</th>
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<tbody>
<tr>
<td>L2. Process</td>
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</tr>
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</tr>
</tbody>
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- Header
- Contact requirements
- Communicational content requirements
- Reaction requirements

```
<table>
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<tr>
<th>SENDER</th>
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<tbody>
<tr>
<td>CONTACT</td>
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<tr>
<td>MESSAGE</td>
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</table>

INFORMATION SYSTEM

RECEPTION

RECEIVER

RECEIVER
```
**Activity 4. Communicative event specification.**

**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.

Communication Structure of event PHO 3

<table>
<thead>
<tr>
<th>FIELD</th>
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<th>DOMAIN</th>
<th>BUSINESS OBJ</th>
<th>EXAMPLE VALUE</th>
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<tbody>
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<td></td>
<td>Valencia</td>
</tr>
<tr>
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<td>d</td>
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<td></td>
<td>9638700000 ext 83534</td>
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<tr>
<td>Phone # +</td>
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<td>text</td>
<td>Canon A1 w. telemacro</td>
<td>N/A (sample of work)</td>
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**Proposal**

- Activity 4

**Communication Structure:**

<table>
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<td>Sergio Pastor Gonzalez</td>
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<tr>
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<td>Camino de Vera s/n 46522</td>
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**Motivation**

- Requirements structure and method activities

**Requirements levels**

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**Legend**

- Activity
- Influence
- Outcome
- Production
- Challenge
- Alternative
- Selection
- Aggregation
- Iteration
- Dynamic perception
- Static perception
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!