Concept of Operations
&
V-Model

Proyectos Integrados

Grado en Ingeniería Electrónica, Robótica & Mecatrónica

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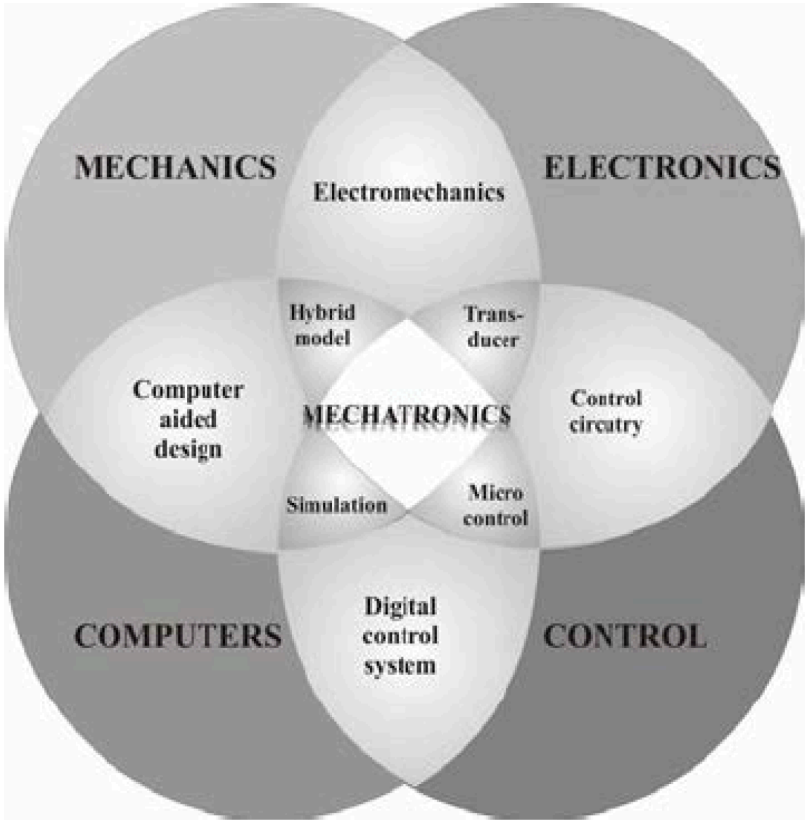
Mechatronics

Definition:

"Synergistic integration of mechanical engineering with electronics and intelligent computer control"



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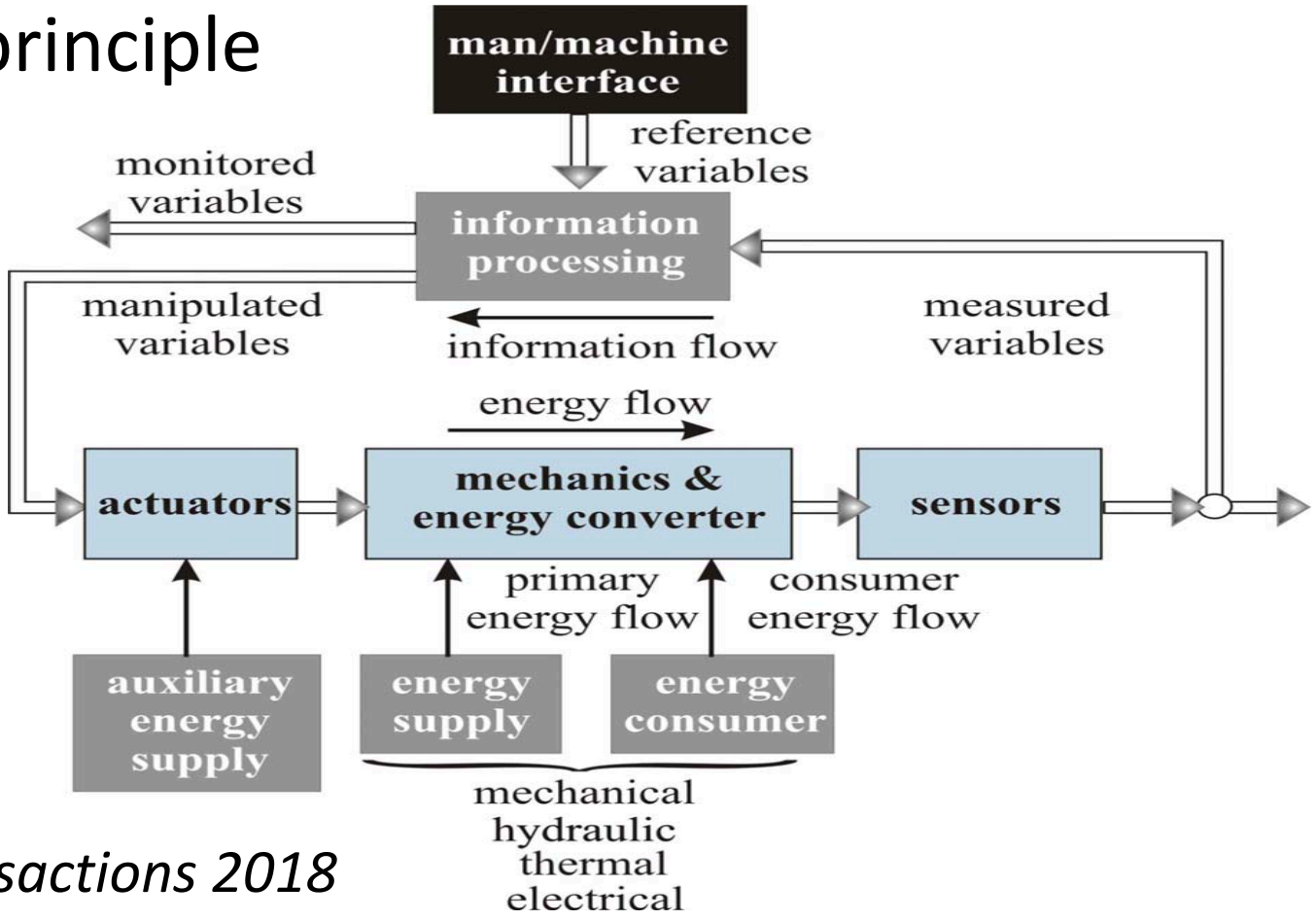
Mechatronics

Working principle



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Case of study - Pre-study

Project:

- Gather information
- Conditions of operation (ConOps)
- Environmental factors
- Quality
- Physical dimensions
- Cost
- Target market
- Target user (customer)
- Aesthetics

Concept of Operations (ConOps)

Main purpose:

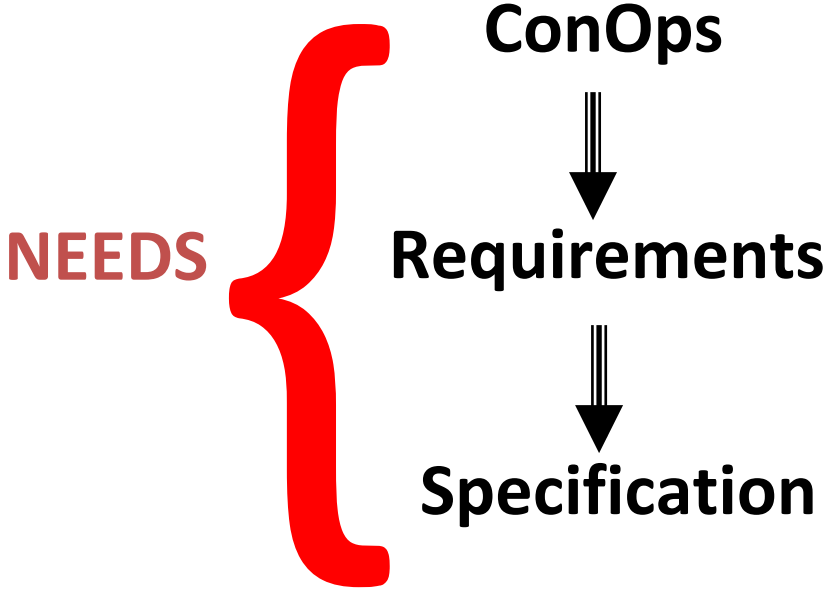
- To communicate the user's needs for and expectations of the proposed system to the buyer and/or developer
- To communicate the buyer's or developer's understanding of the users' need and how the system shall operate to fulfill those needs

"Building consensus among several users, buyers, organizations and developers"

Concept of Operations (ConOps)

Definition ConOps document according to IEEE Std 1362-1998 (software):

*"A **user-oriented** document that describes a system's operational characteristics from the end user's viewpoint"*



ConOps document outline

ConOps DOCUMENT - IEEE Std 1362-1998

Title page
Revision chart
Preface
Table of contents
List of figures and tables

1. Scope
1.1 Identification
1.2 Document overview
1.3 System overview

2. Referenced documents

3. Current system or situation
3.1 Background, objectives, and scope
3.2 Operational policies and constraints
3.3 Description of the current system or situation
3.4 Modes of operation for the current system or situation
3.5 User classes and other involved personnel
3.6 Support environment

4. Justification for and nature of changes
4.1 Justification of changes
4.2 Description of desired changes
4.3 Priorities among changes
4.4 Changes considered but not included

5. Concepts for the proposed system
5.1 Background, objectives, and scope
5.2 Operational policies and constraints
5.3 Description of the proposed system
5.4 Modes of operation
5.5 User classes and other involved personnel
5.6 Support environment
6. Operational scenarios

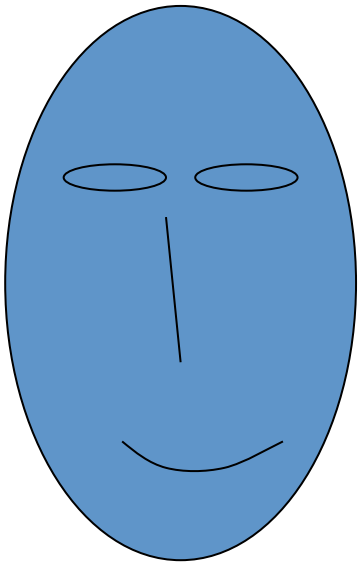
7. Summary of impacts
7.1 Operational impacts
7.2 Organizational impacts
7.3 Impacts during development
8. Analysis of the proposed system
8.1 Summary of improvements
8.2 Disadvantages and limitations
8.3 Alternatives and trade-offs considered

9. Notes
Appendices
Glossary

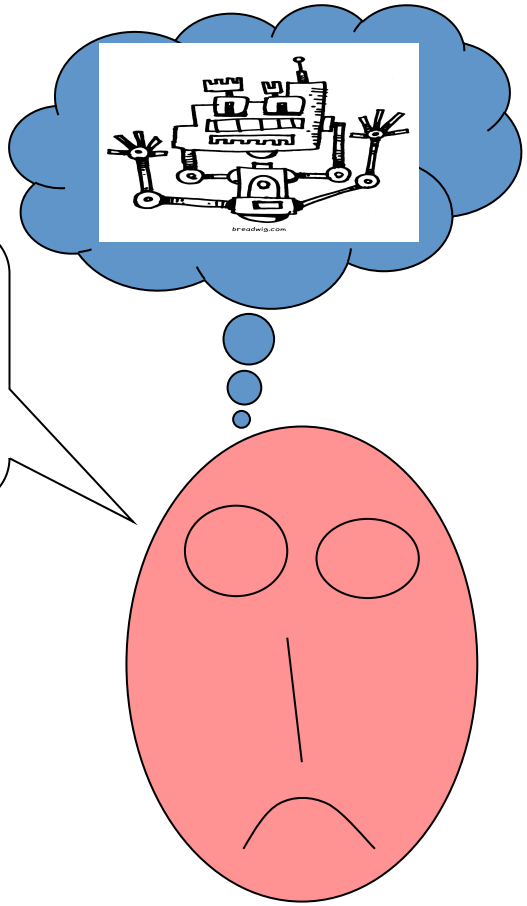
What about your Project!

Elicitation -> Requirements

What is your need ?



I need a system that works
OK
Robust and respond to my wishes



Elicitation -> Requirements

Elicitation (The Wish List):

- Process of identifying needs
- Front End to systems development
- Involves social, communicative and technical issues (Expected: unambiguous, complete, verifiable, consistent, modifiable, traceable)

Gather information:

- Documentation
- Interviews
- Questionnaires
- Scenarios
- Ethnography

What to do in your Project!

Requirements

User (Needs):

- Performance
- Usability
- Friendly
- Safe
- Reliability
- Availability
- Maintainability
- Consumption
- Aesthetics

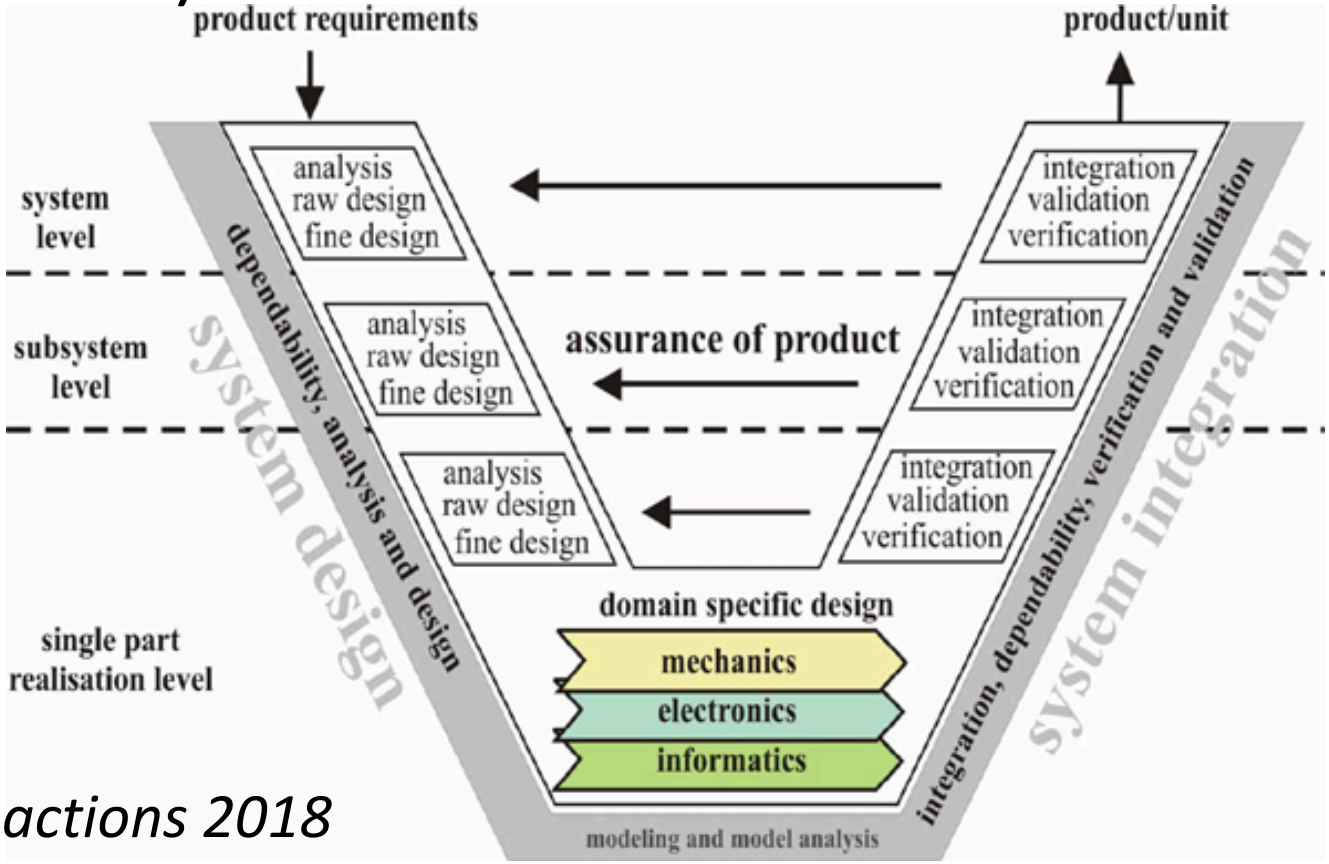
System:

- FROM Operational TO:
  - Specifications
  - Operation
  - Maintenance
  - Manuals
- HARD: minimal for users
- SOFT: trade-off proposed by engineers

Creativity/innovation: to exceed (NOT meet) expectations

The V-Model

VDI 2206 (2004)



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The V-Model

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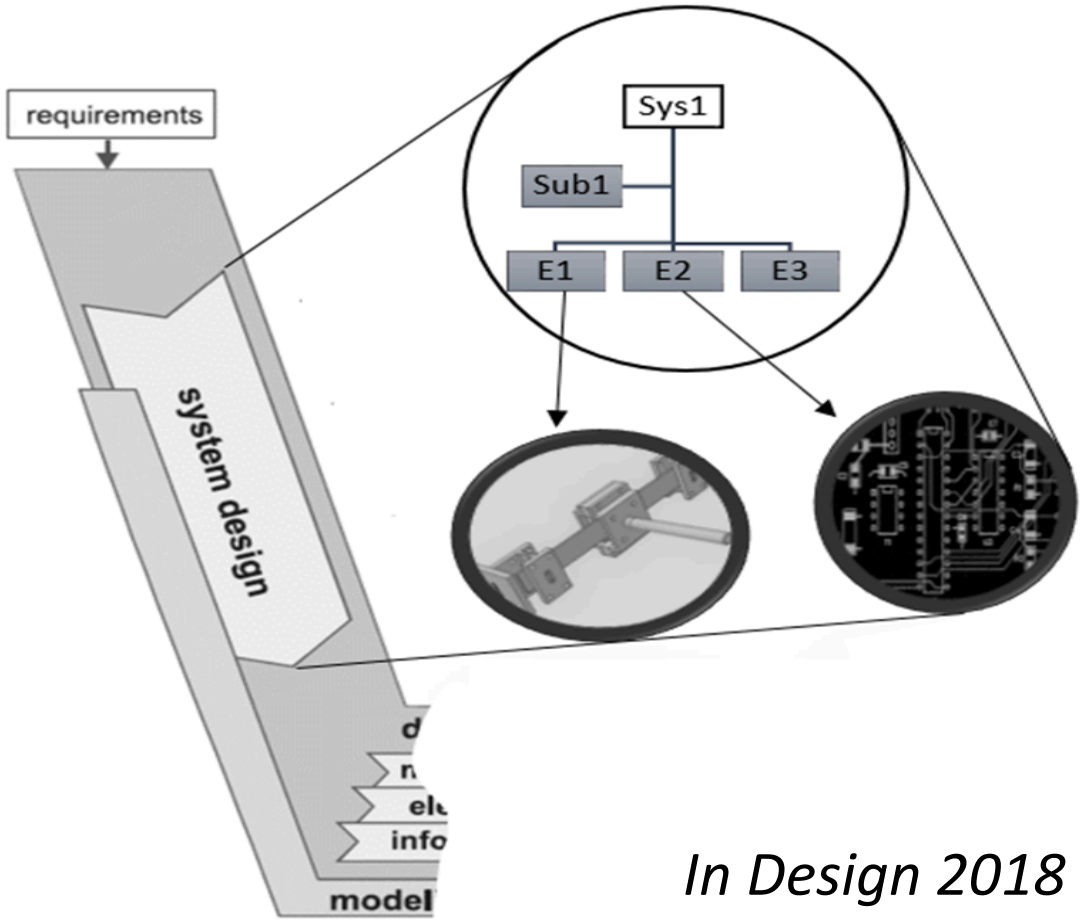

Holistic system architecture: sub-systems and components

In Design 2018

The V-Model

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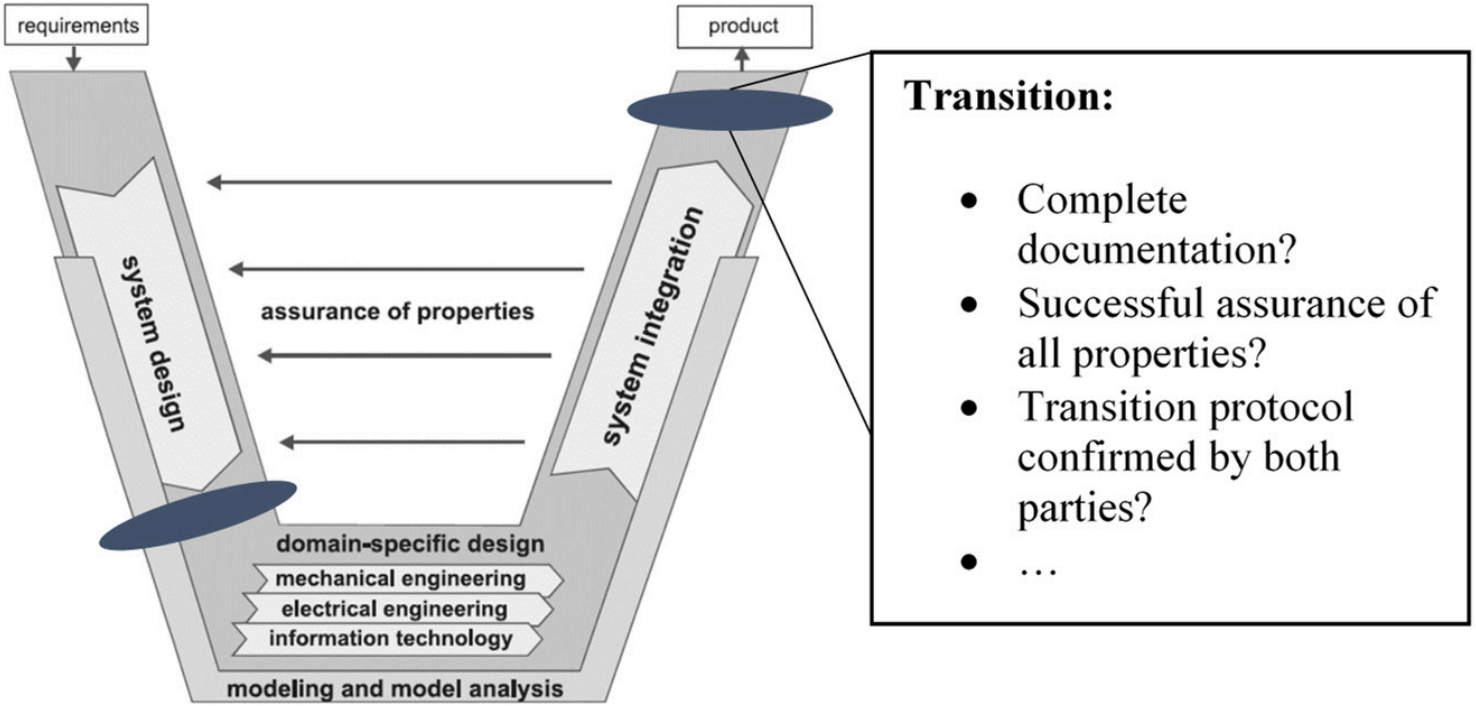

In-process status revision: milestone, gates