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ETSIIT Lecturer

Electronics Department, University of Granada - SPAIN

T.1 - Previous concepts

Concept, Design, Prototyping & Project Management

Printed Circuits Technologies 15

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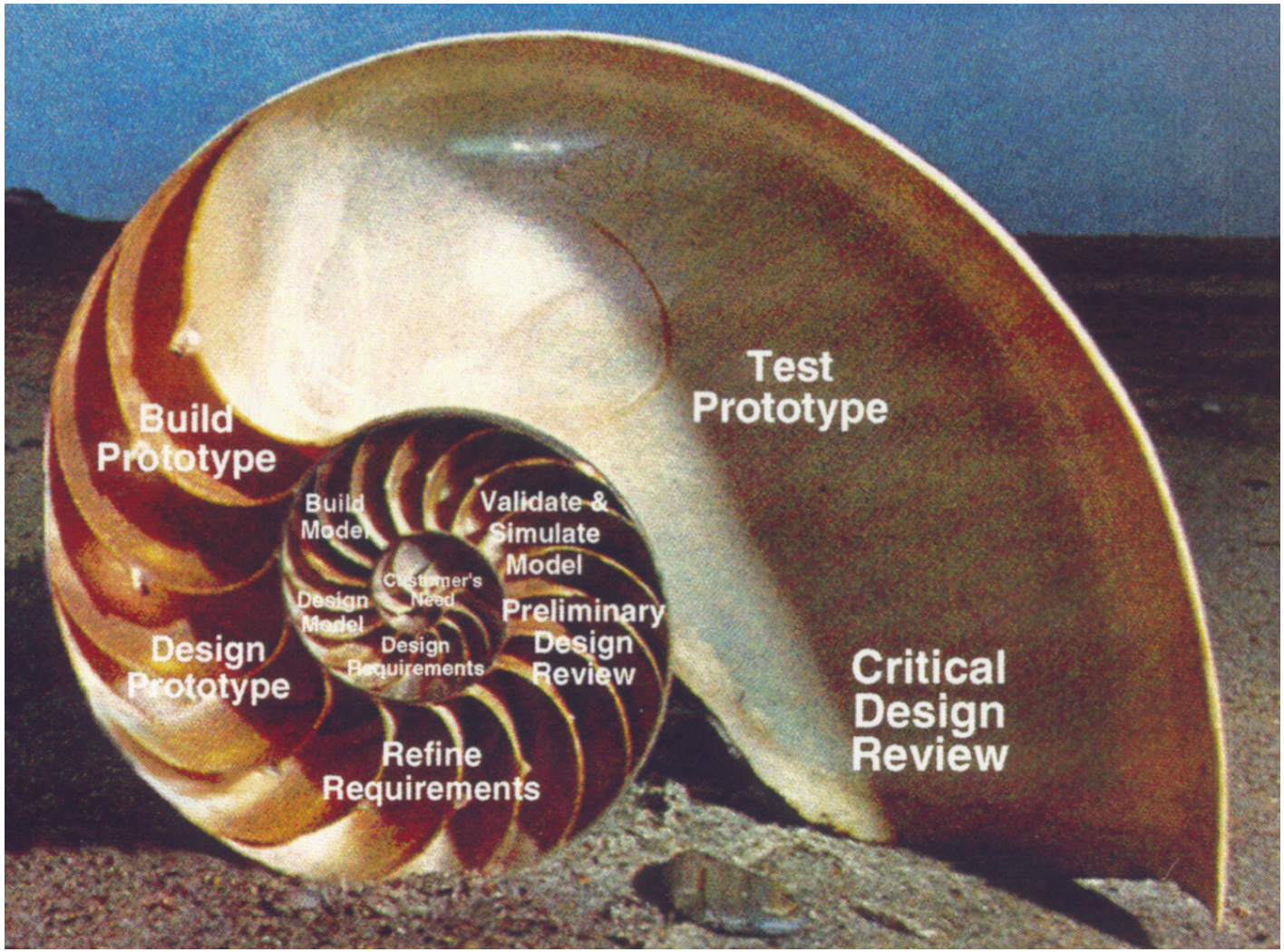
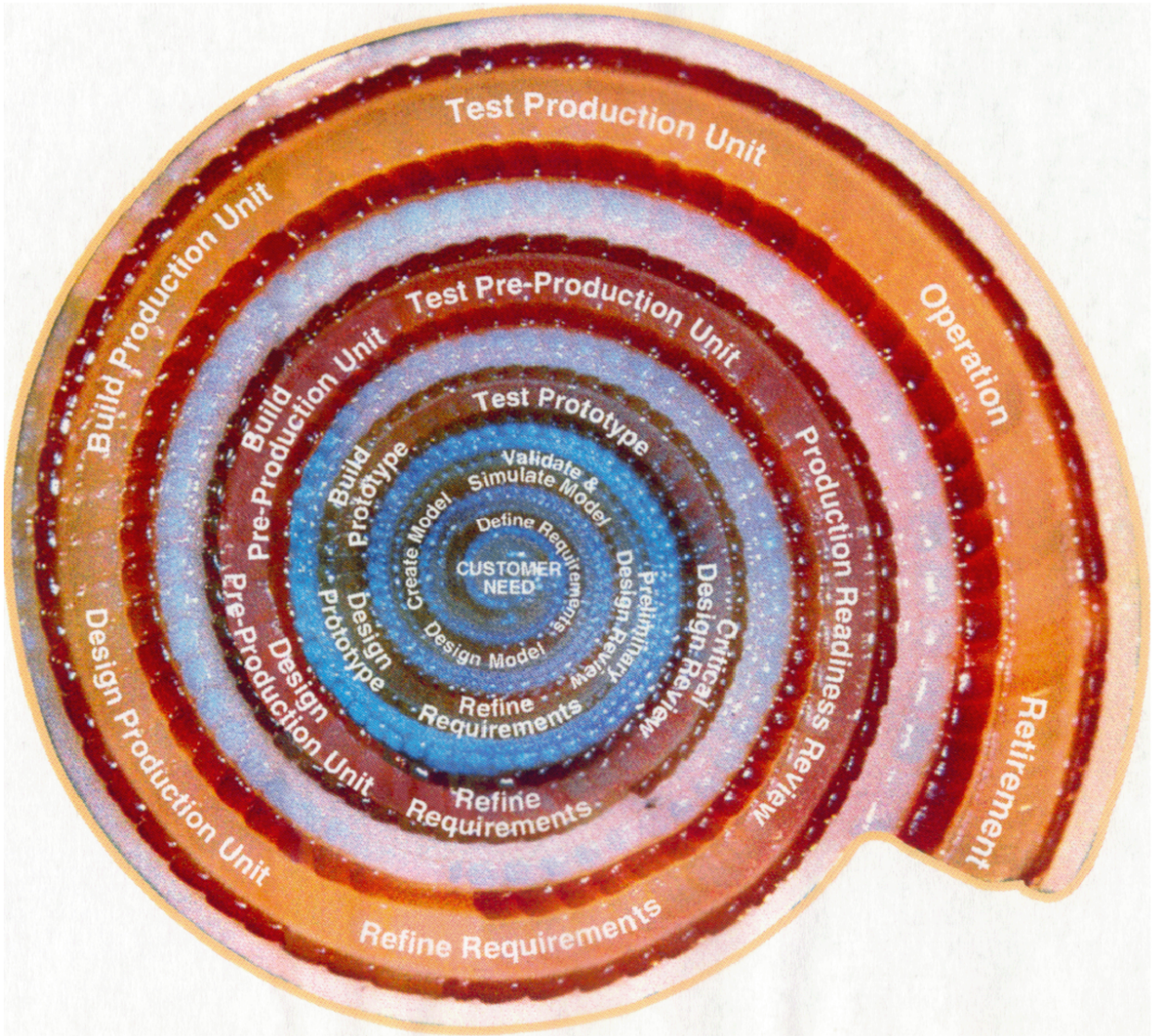
System design process (SDP)

First steps in the SDP

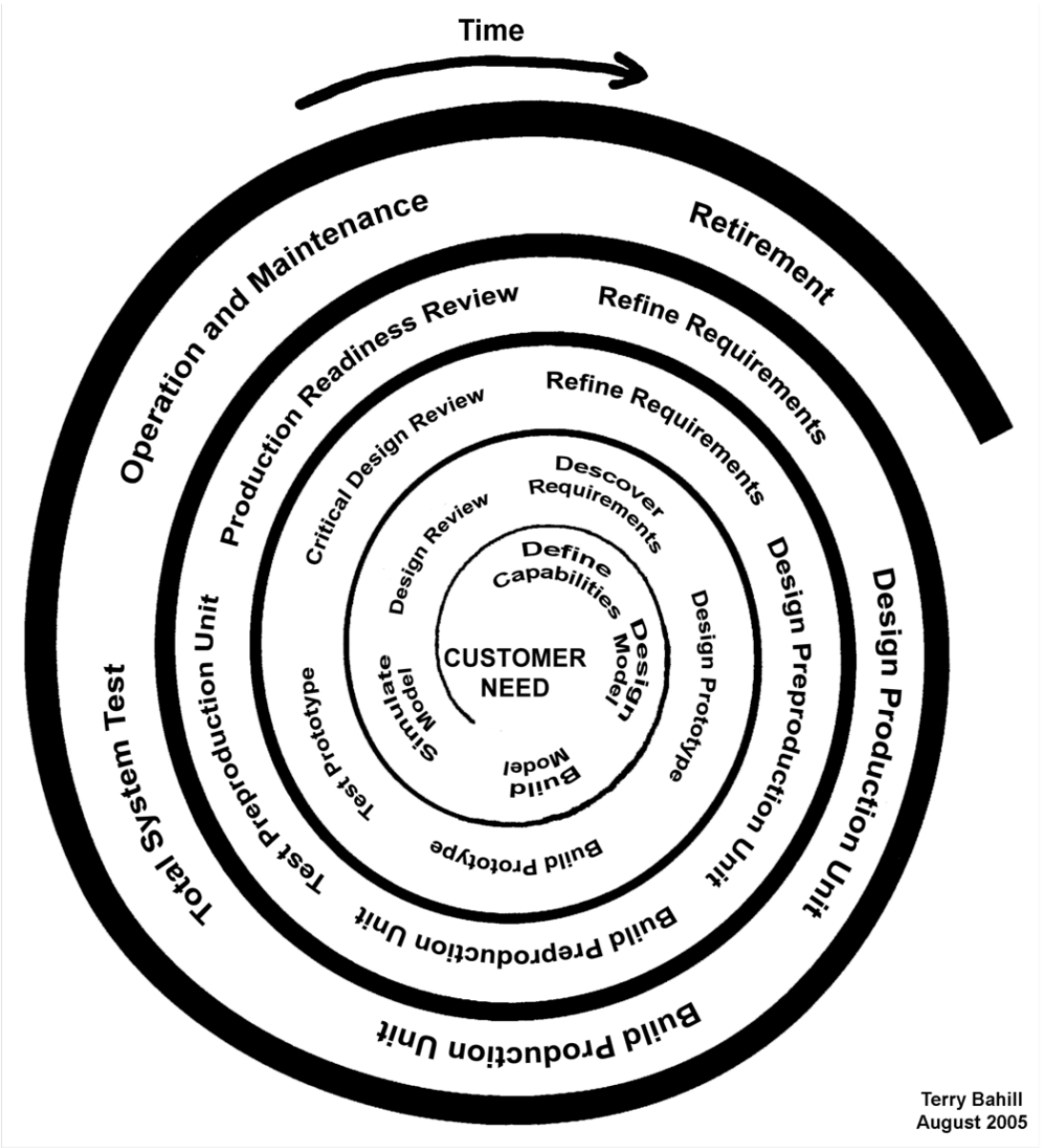


The System Design process

The hole process, from the beginning to the end



Spiral Lifecycle model



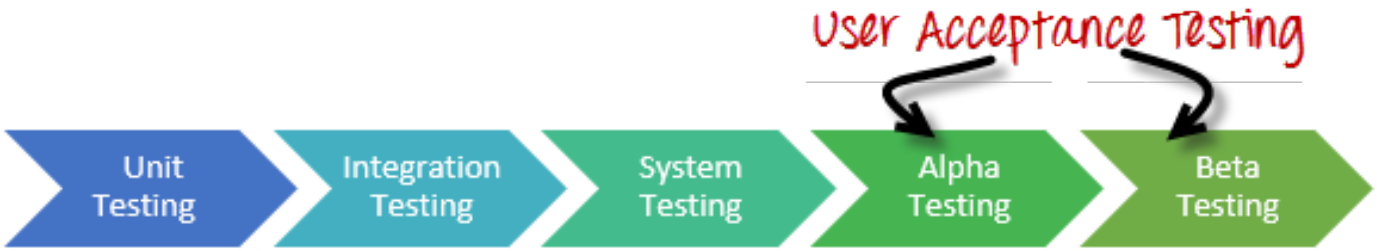
Alpha Beta Testing - DeMystified

α-test

Alpha testing is a type of acceptance testing; performed to identify all possible issues/bugs before releasing the product to everyday users or public. The focus of this testing is to simulate real users by using blackbox and whitebox techniques.

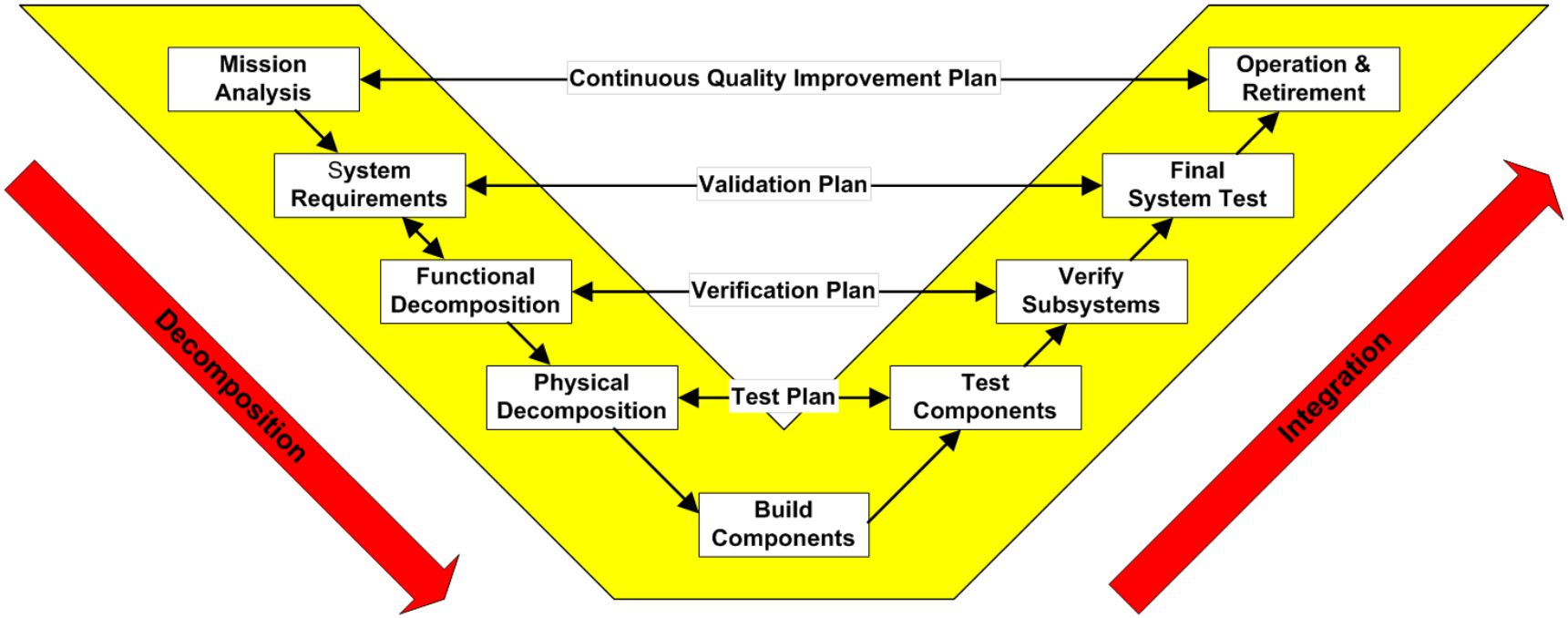
β-test

Beta Testing of a product is performed by "real users" of the software application in a "real environment" and can be considered as a form of external user acceptance testing.



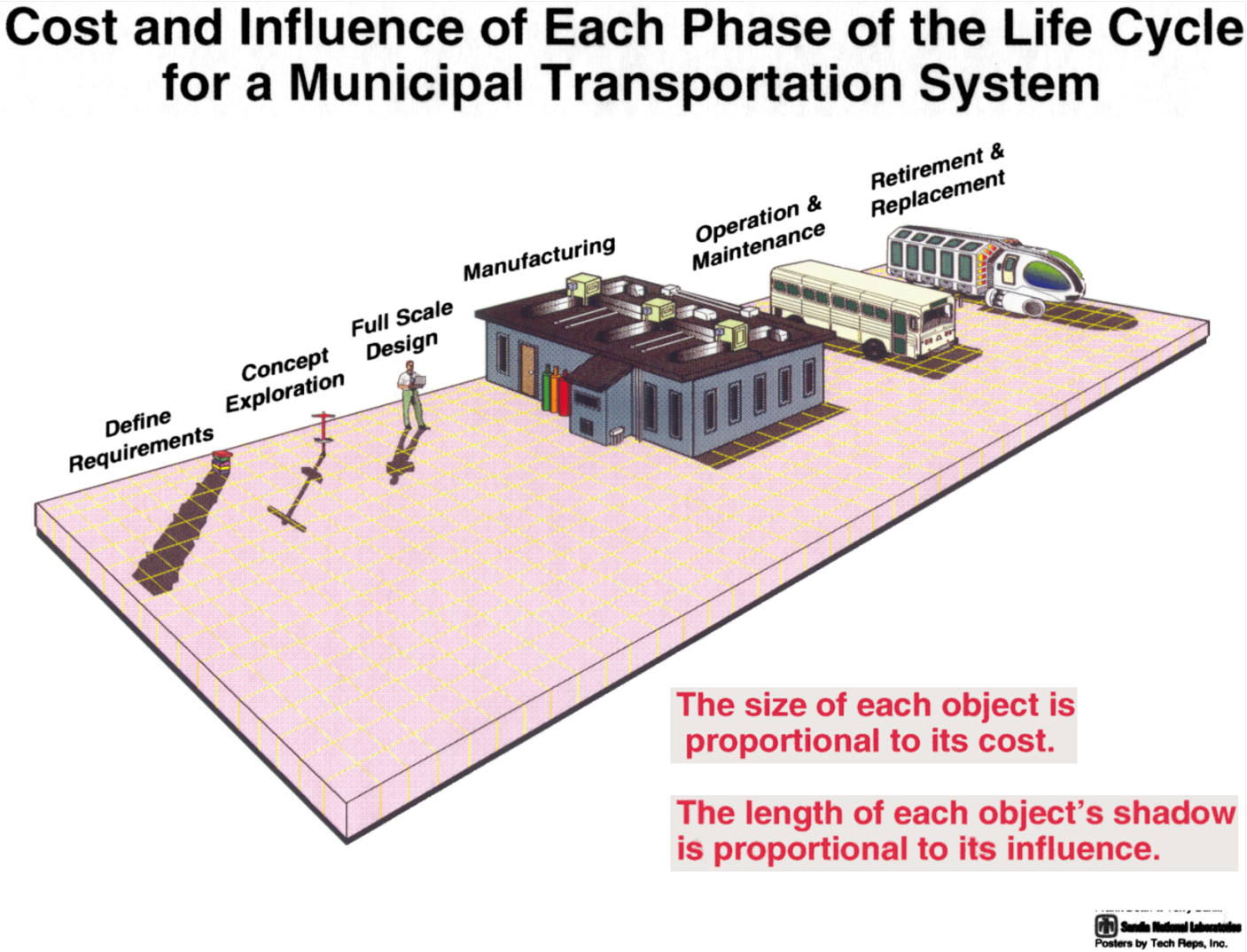
Vee Life cycle model

Other way of thinking

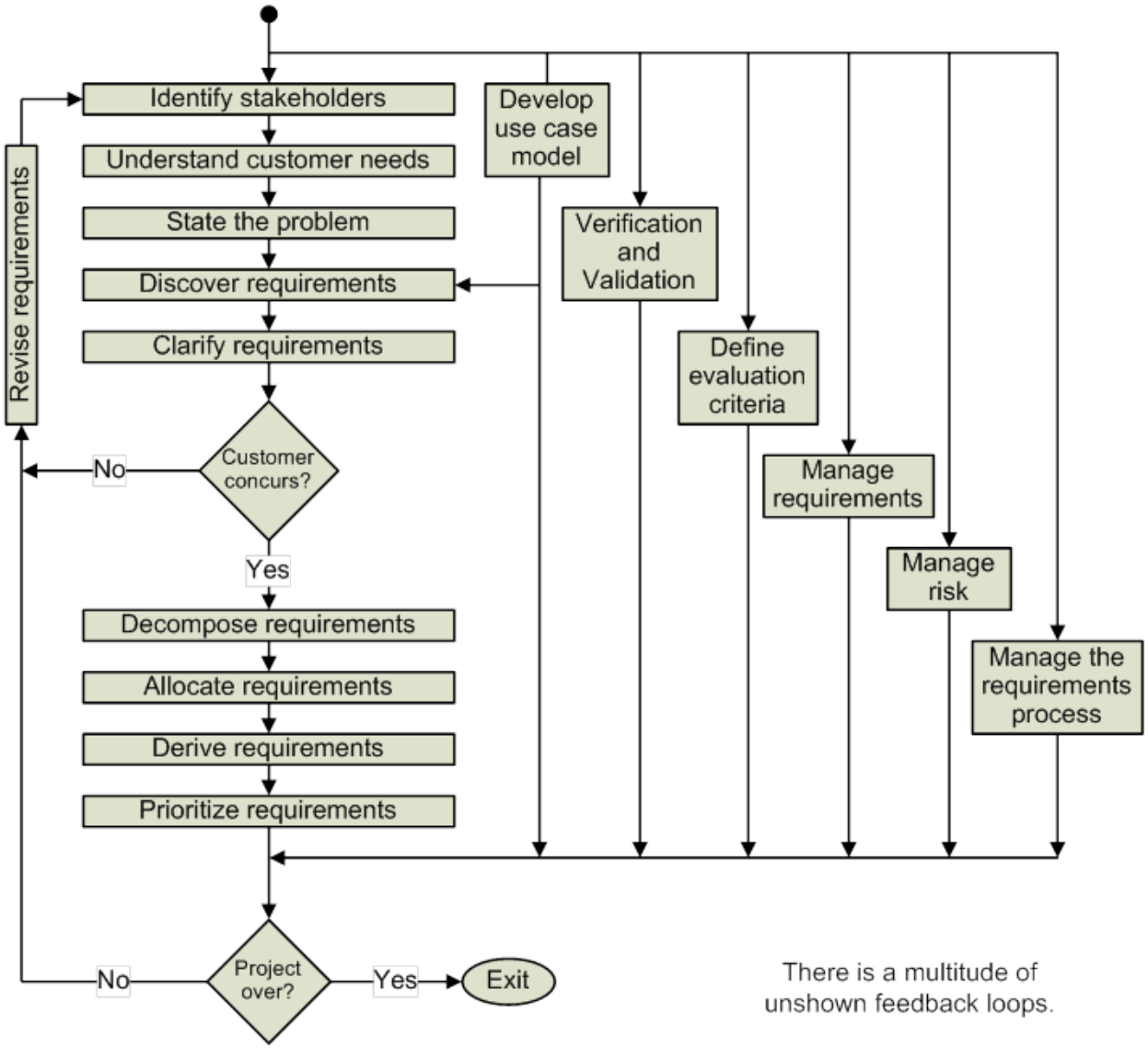


The design downstroke and the manufacturing upstroke

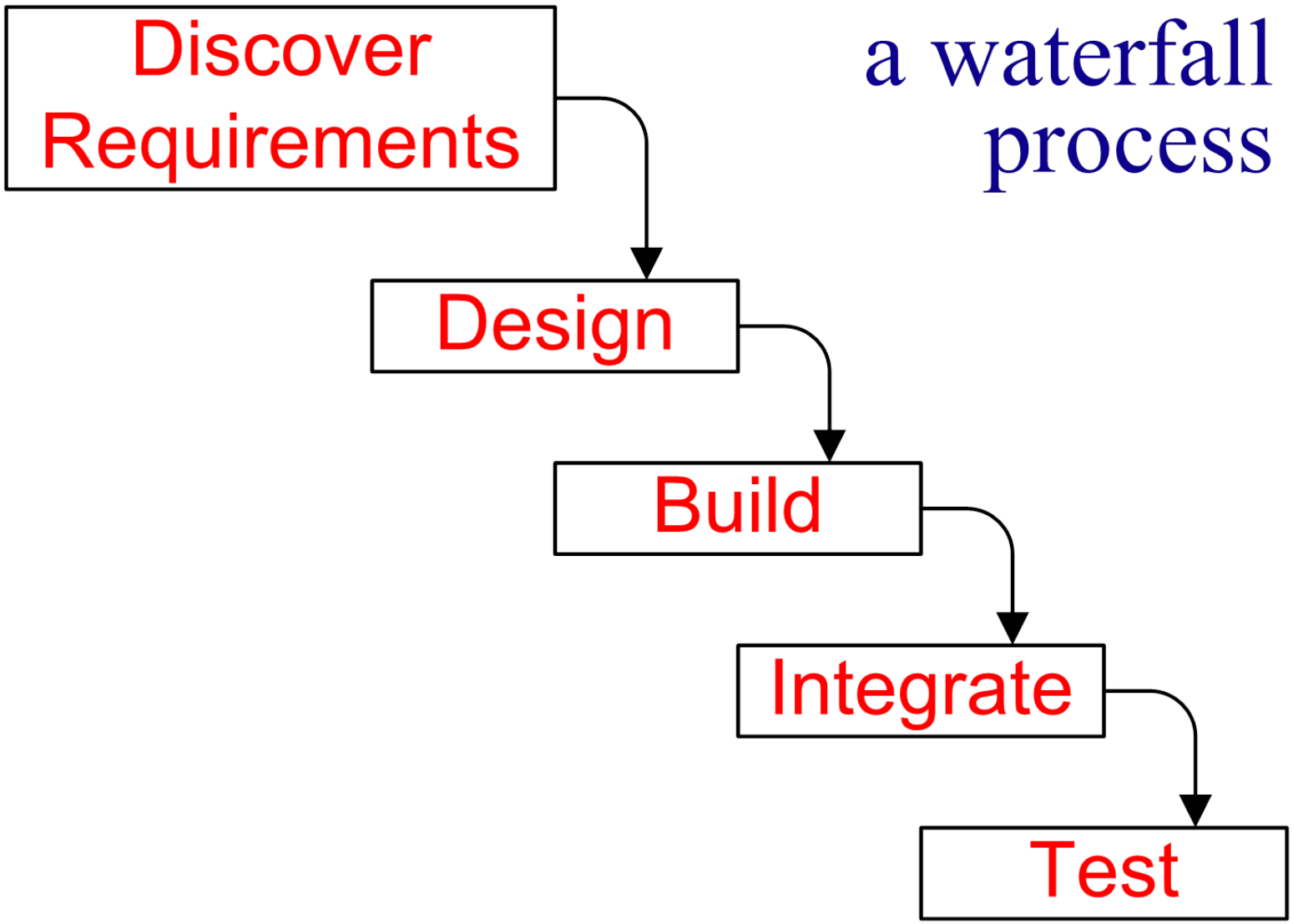
Cost & influence of each Phase of the Life Cycle



Requirements discovery process



Systems engineering is not !



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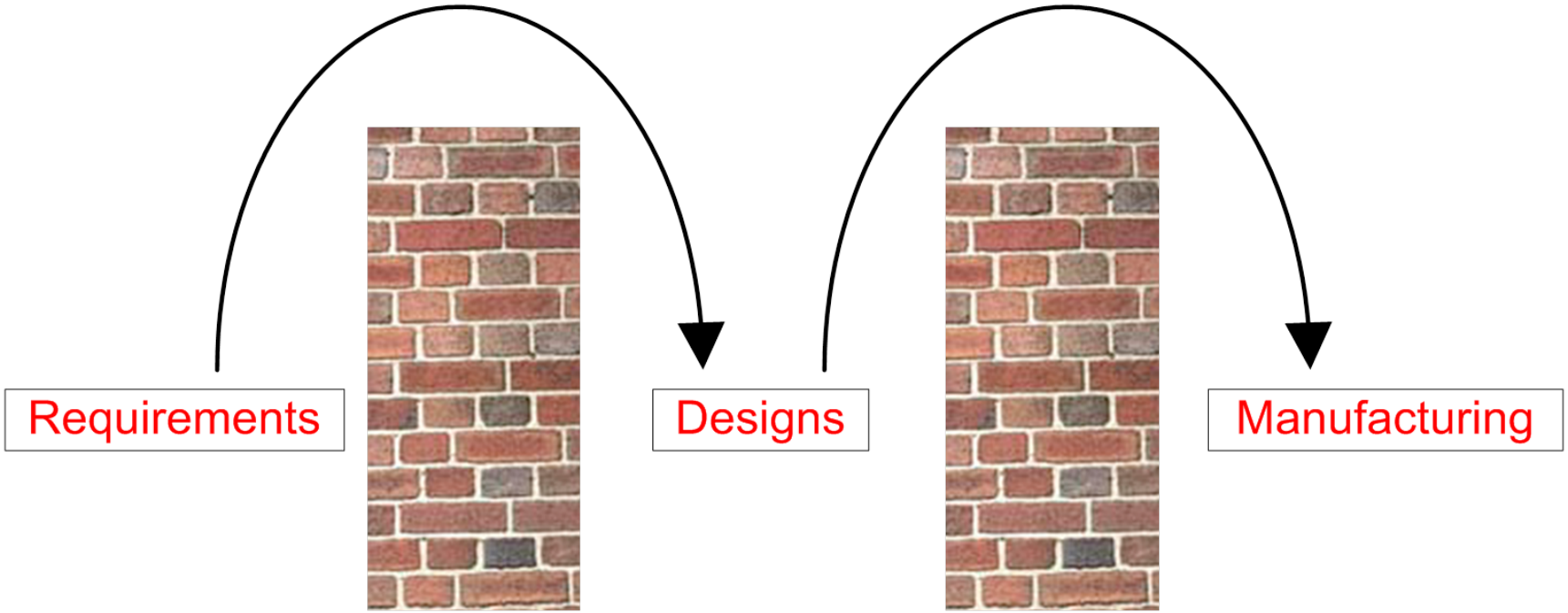
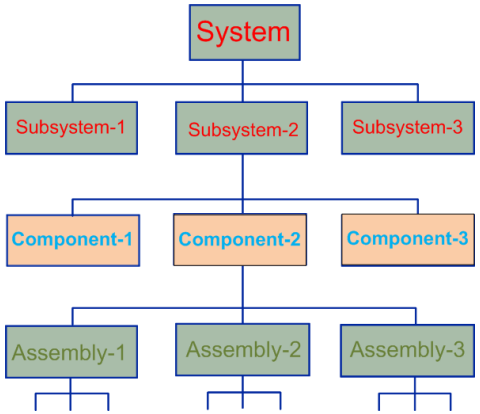
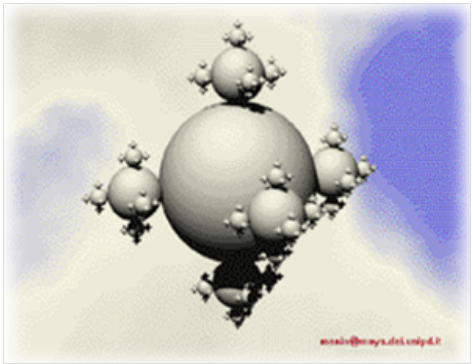


a throw it over the wall process

Systems engineering is a fractal process





The systems engineering process is applied at levels of greater and greater detail.

It is applied to the system, then to the subsystems, then to the components, etc.
Similarly for the *fractal pattern* above, the same algorithm was applied at the large structural level, then at the medium-scale level, then at the fine-detail level, etc.

Principles of good design
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Terry Bahill and Rick Botta, Fundamental Principles of Good System Design, *Engineering Management Journal, 20(4), 9-17, December 2008*.

- Use models to design systems
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- List functional requirements in the use cases

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Purpose of the principles

- Using these principles will increase the probability of producing good designs.
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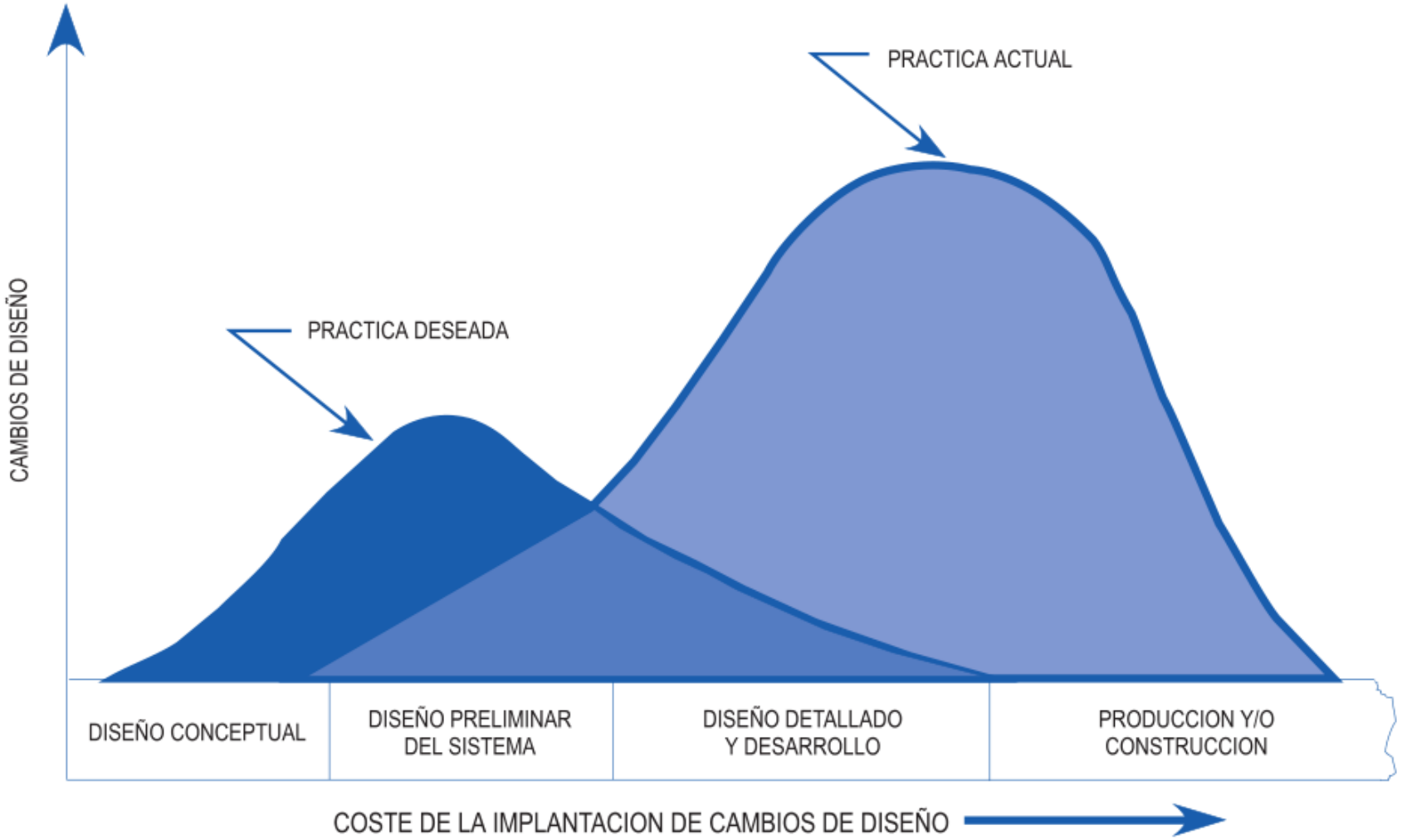
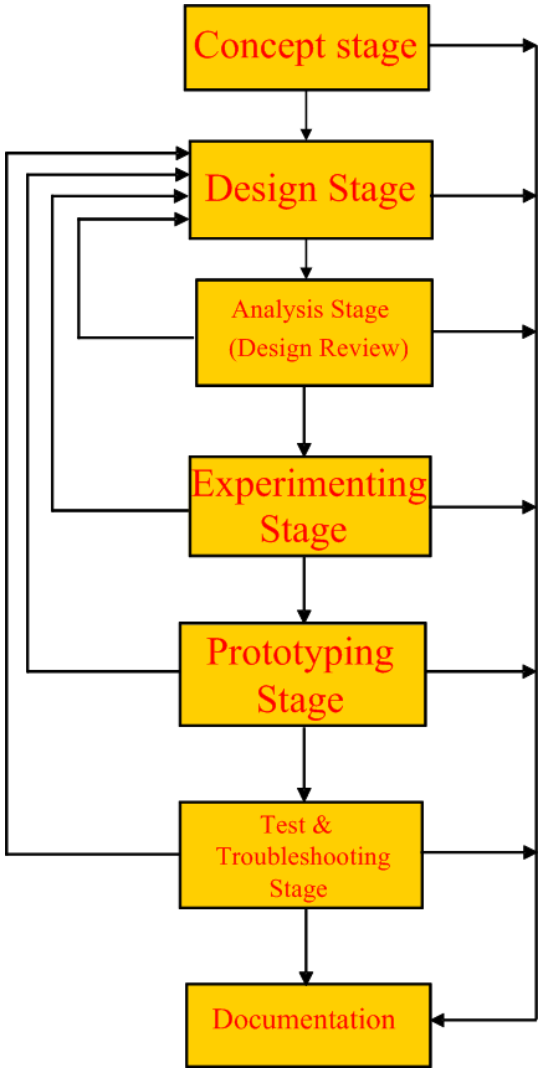
Impact of the changes introduced in the desing!

Why are we doing wrong?



Design Phases!

Designing algorithm



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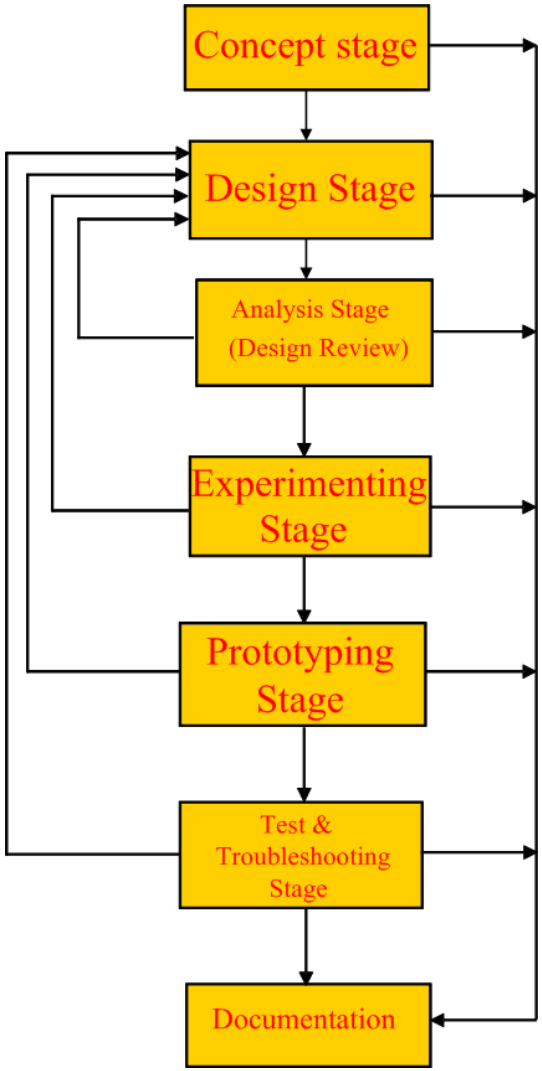

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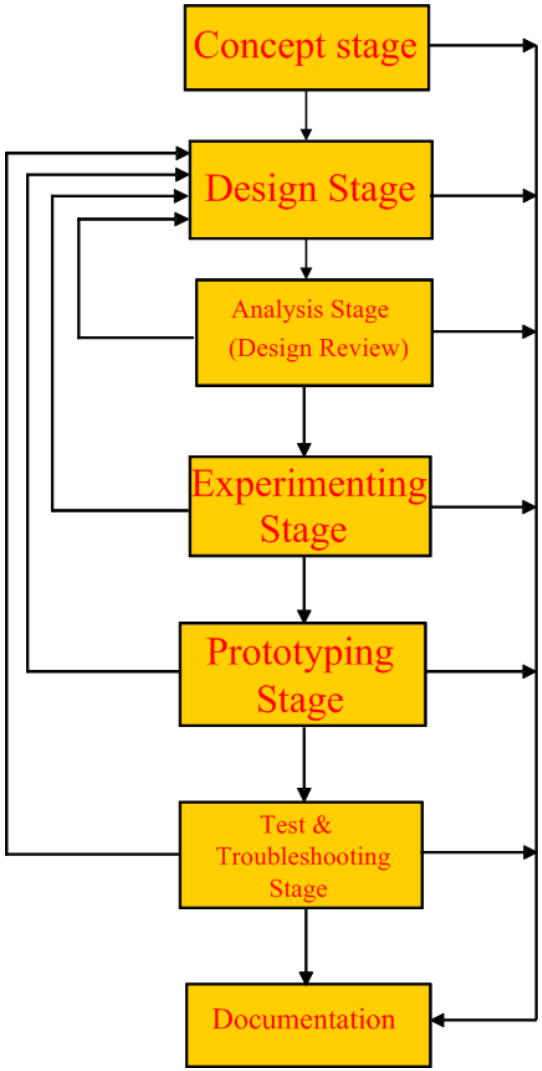

- Concept
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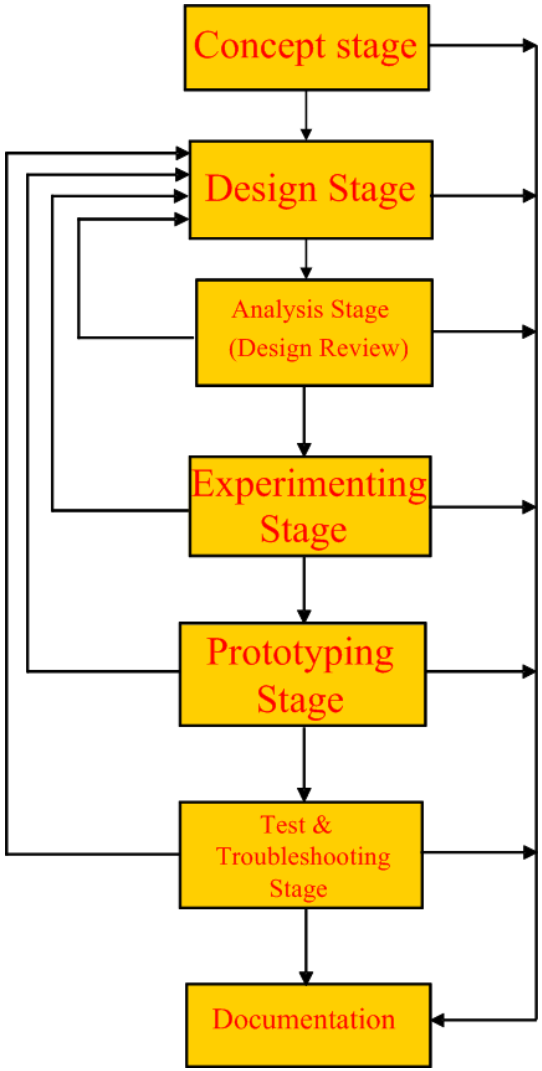

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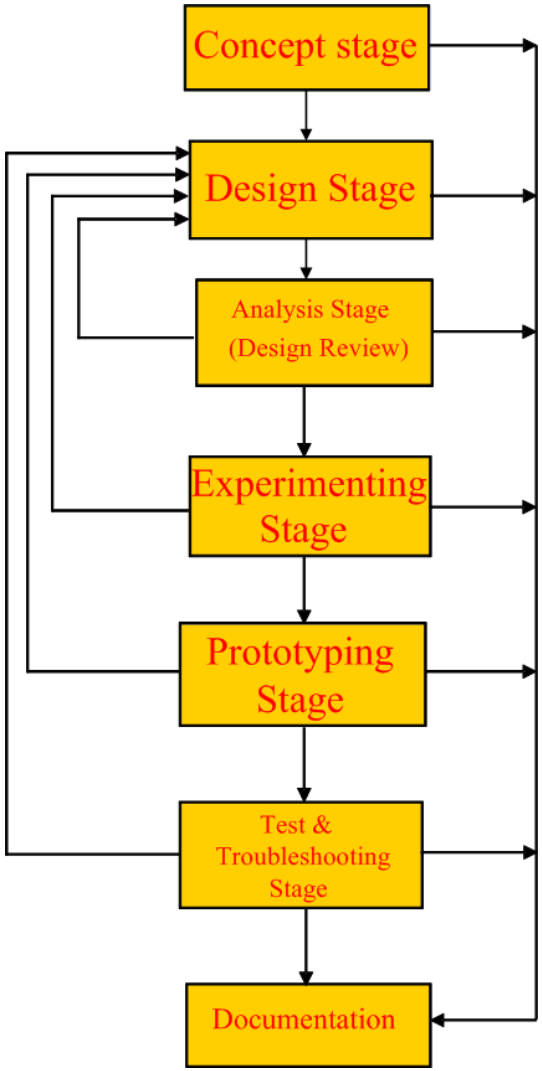

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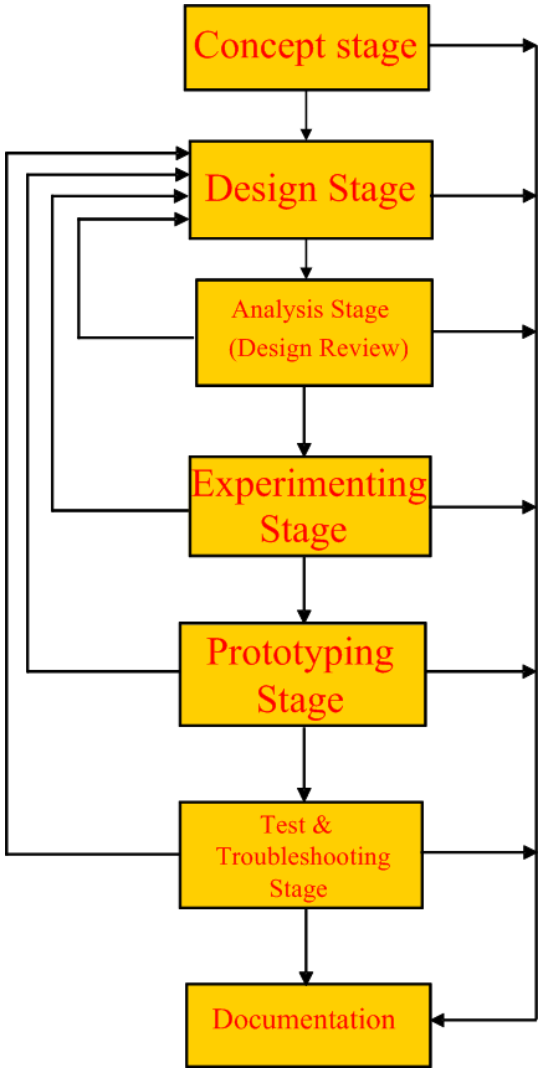

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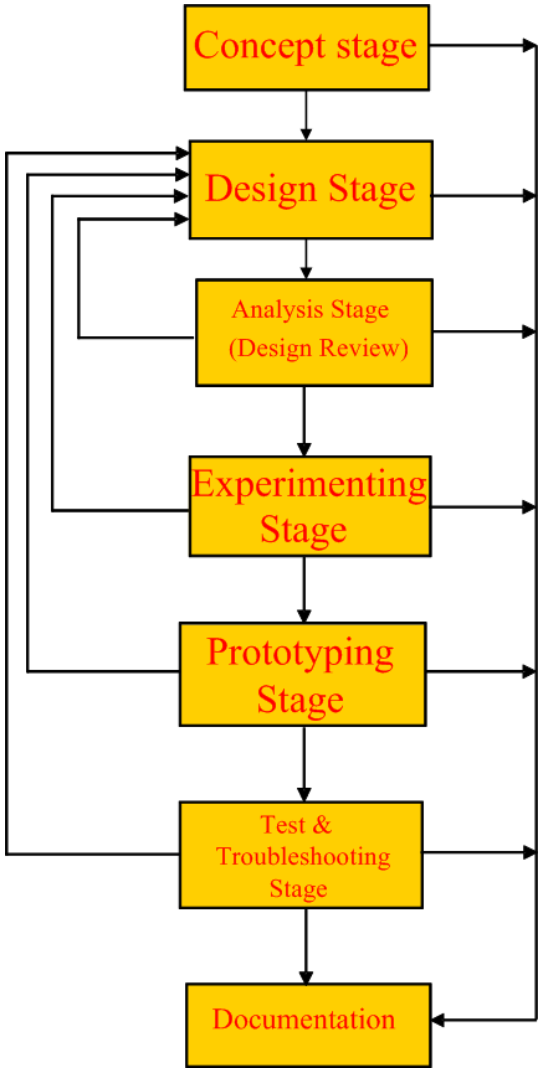

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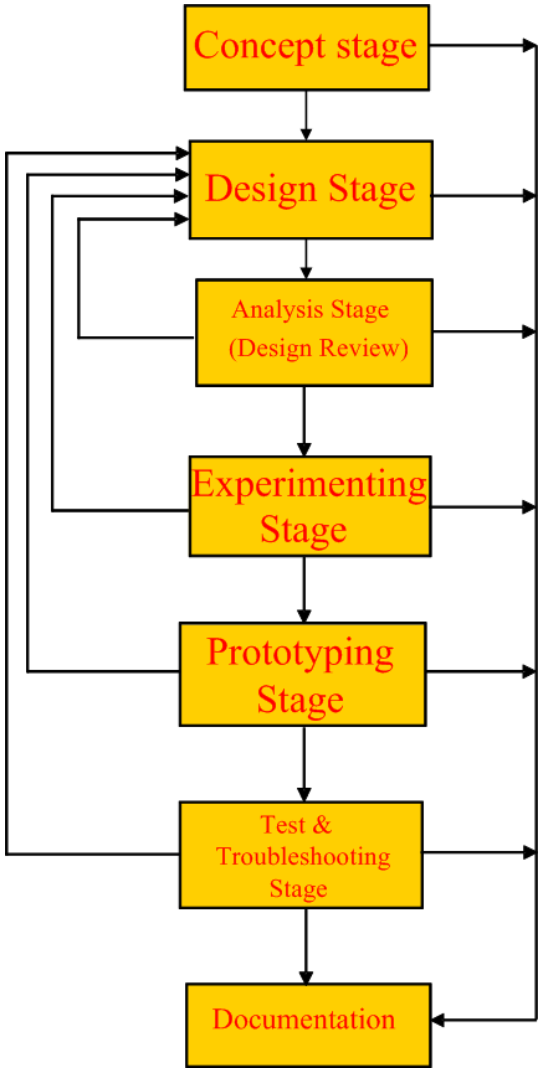

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Design

- System approach
  - Electronic Circuitry
  - Role of Input & Output Transducers
  - Product Packaging
  - User Needs
  - TQM- ▸ Total Commitment to Quality ▸ Vishay Tantalum Capacitor - Total quality Example

Design Review

- To check whether:
  - the requirements are met
  - the design is optimum
  - right components are selected
  - Quality aspects are taken in to
  - it is practical to go in for production
  - It is a time bound proposal

Experimentation

- To check whether the the circuit functions - Design Validation
- No concern with project lay out and packaging

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Prototyping

- PCB Design
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Testing & Troubleshooting a Prototype Project

- Preliminary testing
- Operational Testing

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- Preliminary testing
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- Performance testing

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Final Documentation

1. Test Results Documentation
2. Summary & Recommendations Document

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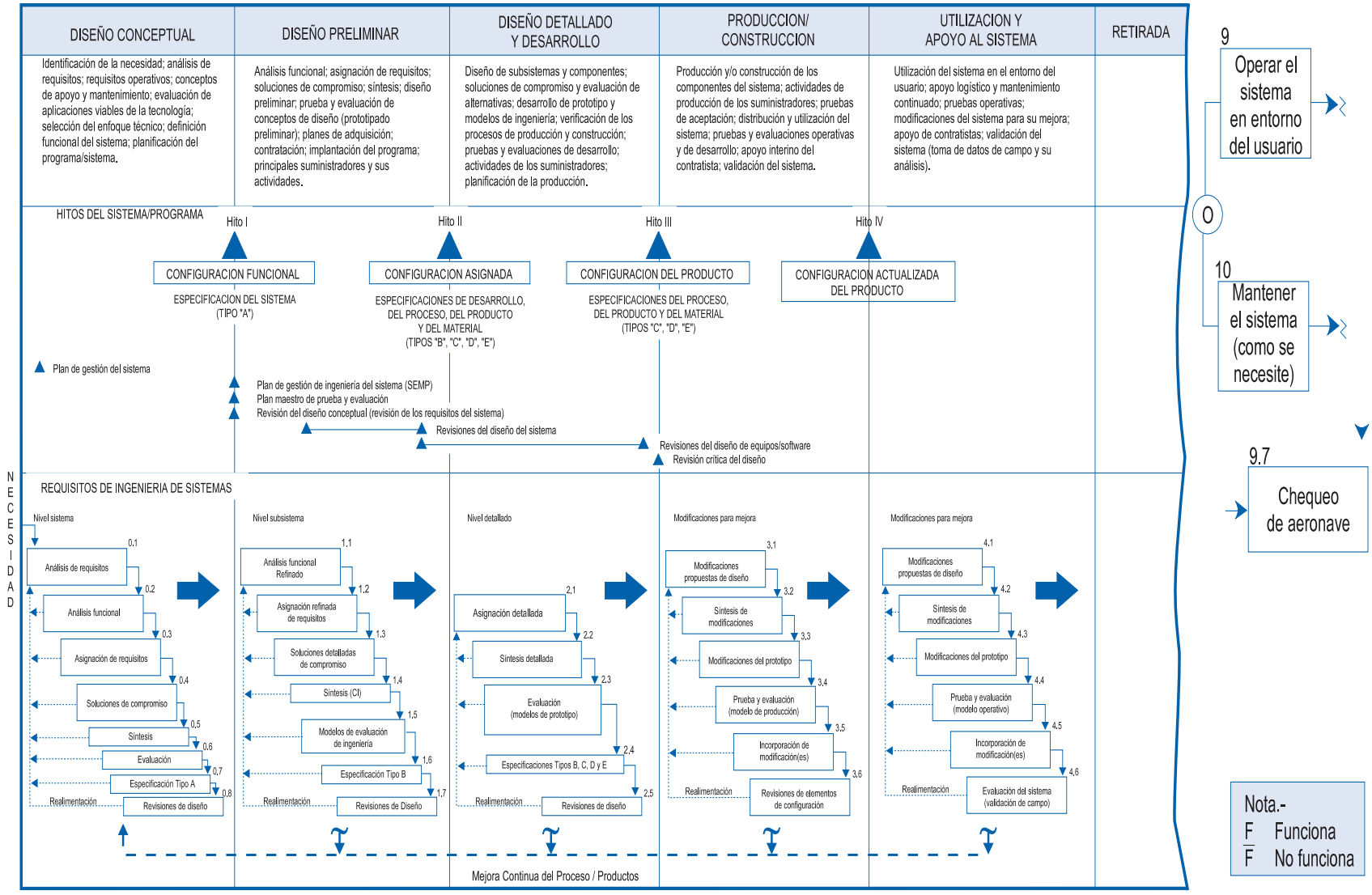

Figura 7. - EL CICLO DE VIDA DEL SISTEMA ("CONFIGURACION") -