

ELG2336

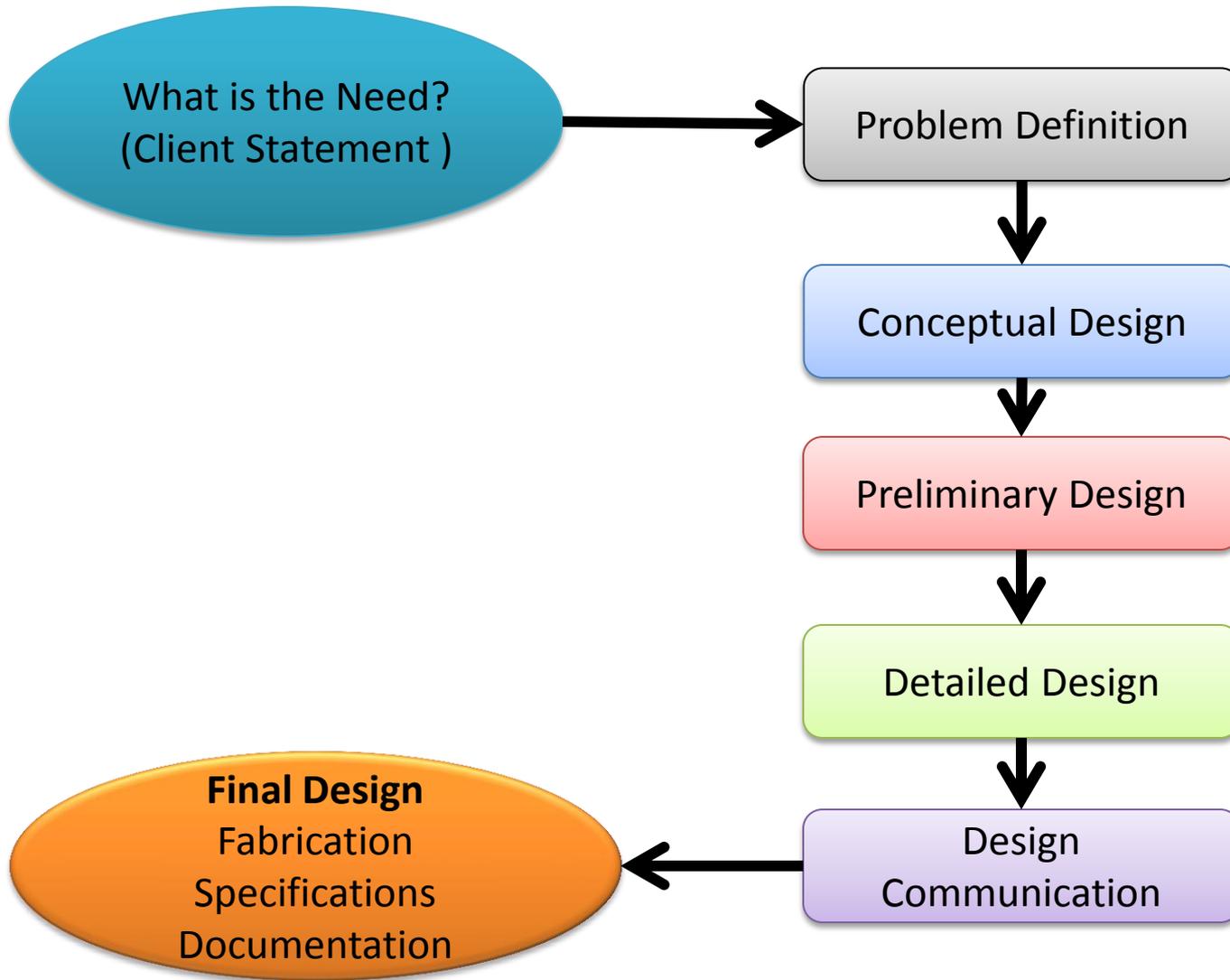
Introduction to Engineering Design

Both the engineer and scientist are thoroughly educated in the mathematical and natural sciences, but the scientist primarily uses this knowledge to acquire new knowledge, whereas the engineer applies this knowledge to design and develop usable devices, structures and processes. In other words. The scientist seeks to know, the engineer aims to do”.

Eddie, Jenison, Mashaw and Northup, Engineering Fundamentals and Problem Solving.

I hear... I forget
I see... I remember
I do... I understand

— *Confucius c. 500 B.C*



Phases of the Engineering Design Process

Problem Definition

Identify the Problem

Information

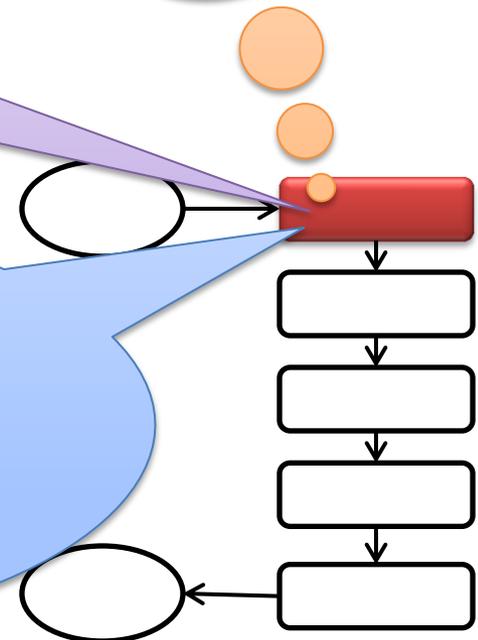
Literature on the state-of-the art!
Experts!
Standards!
Regulations!

Techniques

Objectives tree!
Function-means tree!
Requirements matrix!

Means

Literature review!
Brainstorming!
User surveys and questionnaires!
Interviews!



Conceptual Design

Select the Best Design Parameters

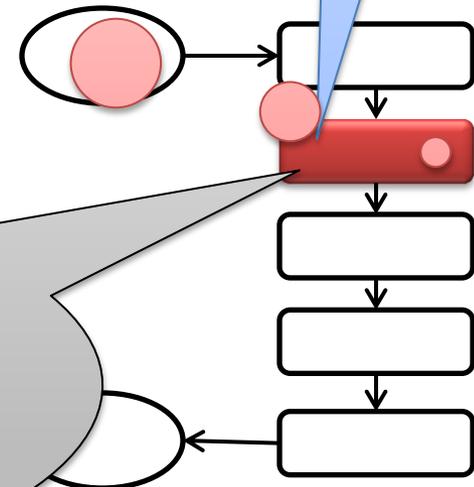
Sources of Information
Other competitive products!

Techniques

Quality function deployment!
Morphological chart!

Means

Brainstorming!
Benchmarking!
Reverse engineering!



Preliminary Design

Information

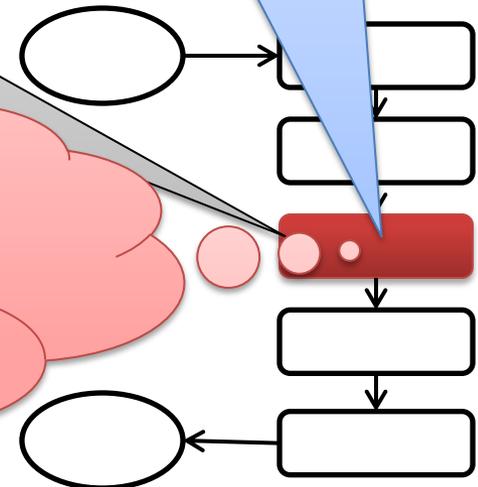
Rules of thumb!
Simple and clear models!
Physical relationships!

Means

Laboratory experiments!
Prototype development!
Simulation!

Techniques

Refined objectives tree!
Comparison charts!



Detailed Design

Means

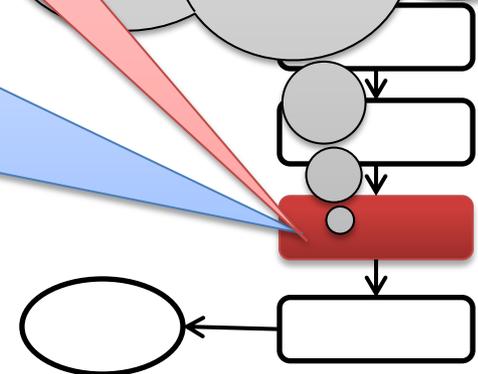
Formal review!
Public hearing!

Information

Design algorithms!
Handbooks!
Local regulations!
Suppliers specifications!

Techniques

Computer graphs and
Drafs



Design Communication

Information

Feedback from clients!

