

Problem Definition

- **Where do problems/opportunities come from?**
- **Why do we need to revisit the problem definition given by the client/sponsor/manager?**
- **Problem definition is the key**
 - Work on the wrong problem => get wrong solution
 - Too big of a problem => never finish
 - Assuming a solution in the problem statement => may not get the best design
- **Other pitfalls**
 - Dive in w/o looking back
 - Jump on first solution w/o considering alternatives
 - Experience (too much or too little)

Examining Problem Definitions

- **“Before the end of the decade, to land a man on the moon and bring him back safely”, President Kennedy, 1961.**
- **Develop a means of escape for wheelchairs bound individuals caught in University Hall during a fire.**
- **Develop a means of insuring the safety of handicapped individuals who might be in University Hall during an emergence.**

Problem Definition: A concise, qualitative statement of WHAT the client's problem is, with primary reference to the client's real needs and with NO reference as to how you solve it.

The Objective Tree Method (Chapter 5)

- **Prepare a list of design objectives**
 - can be generated simply at random
 - ask why? How? What?(Why do we want to achieve this objective? How can we achieve it? What does the client mean by X?)
- **Order the list into sets of higher-level and lower-level objectives**
 - group the objectives into sets
 - identify higher and lower levels in a set (a lower-level objective is a means to achieve a higher level one)
- **Draw a diagrammatic tree, showing hierarchical relationships and interconnections**
 - Some of the sub-objectives are means of achieving more than one higher-level objective.

Procedure for Preparing an Objective Statement

- **Compose a draft statement of the problem (based on the client story)**
- **Expand objectives in qualitative form**
- **Create an objective tree**
- **Specify what are the constraints and what are the criteria**
- **Set limits/targets for constraints/criteria**
- **Compose an objective statement (technical brief)**