EE 4BI6

Lecture 2

Product Planning and Concept Generation

Generic Development Process

- Break project development into phases with a measurable milestone after each phase.
- Develop an overall timetable
- Make the timing of each phase as realistic as possible
- Identify role for each team member
- Identify when each member's contribution(s) is due

Development Steps

- Planning (precedes approval of project and creates mission statement, identifies target market and constraints)

- Concept Development (needs of target market identified, alternative product concepts generated, concept is a description of form, function and features including specifications, also analysis of competitive products and cost justification)

Development Steps (cont'd)

- System-Level Design (definition of product architecture, breakdown into subsystems and components, broad description of each component)

- Detail Design (complete specification, e.g. circuits, software subroutines, purchased components)

- Testing and Refinement (Alpha prototype with similar components, Beta with production line components; component and system tests to identify compliance with specifications or suggest improvements in detailed design)

Product Planning

- Identify possible areas of products
- Identify interests and skills of team (in industry identify development team skills, production capability and company technologies)
- Identify platforms and technologies to be utilized
- Identify realistic goals of product

Concept Development
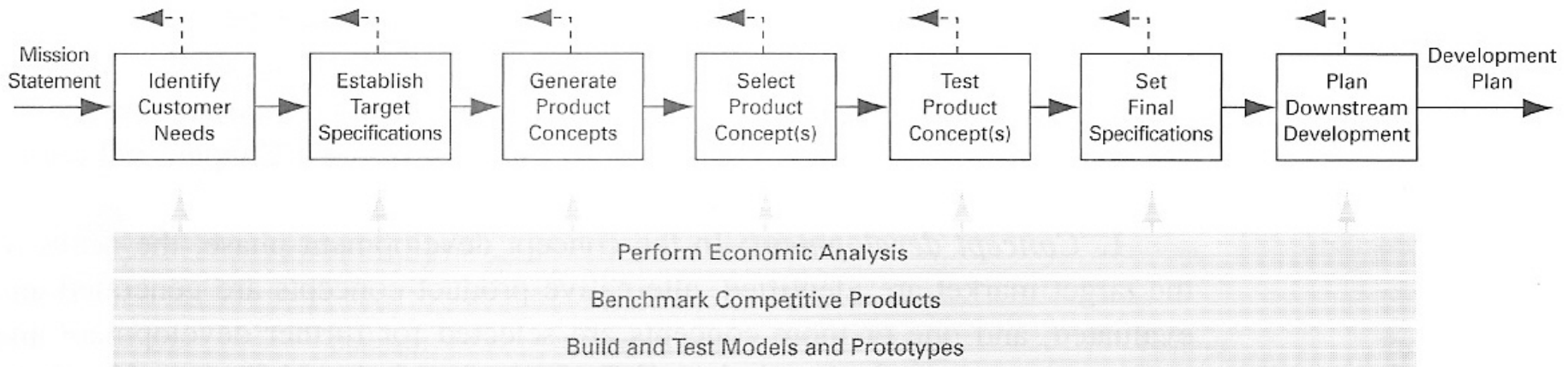
Identify Customer Needs

- What customer needs will your product fill?

- Organize the needs in a hierarchical list

- For 4BI6 determine what features or outputs your project should have

- Identify the "nice to have" features

Establishing Target Specifications

- Precise technical description of what project has to do (e.g. measure temperature with resolution .2 degrees C)

- Dependent on choice of product concept

- May not be the final specifications

Concept Generation and Selection

- What product concepts meet your specifications

- Explore a number of approaches and technologies that may do the job

- Internet search, asking experts, etc.

- Analyze select concepts to determine most suitable (cost, time, etc.)

- Eliminate all but one or several worth testing

- Iterative process

Concept Testing

- Preliminary tests of each concept (initial circuit tests, initial data acquisitions and analysis using virtual designs, e.g. Spice, Labview, 4BD4 systems)

- Identify problems and shortcomings that must be addressed in future design/development

- Early customer (subject) tests

Setting Final Specifications

- Consider target specs as ideal and develop realistic specs from the concept chosen

- Final specs a result of what your design can do rather than what you would like it to do

- Success is how well your design meets these specs

- Tradeoff of specs vs cost

Project Planning

- Detailed development schedule
- Strategy to minimize development time
- Identify resources required
- Establish budget
- Identify roles of team members