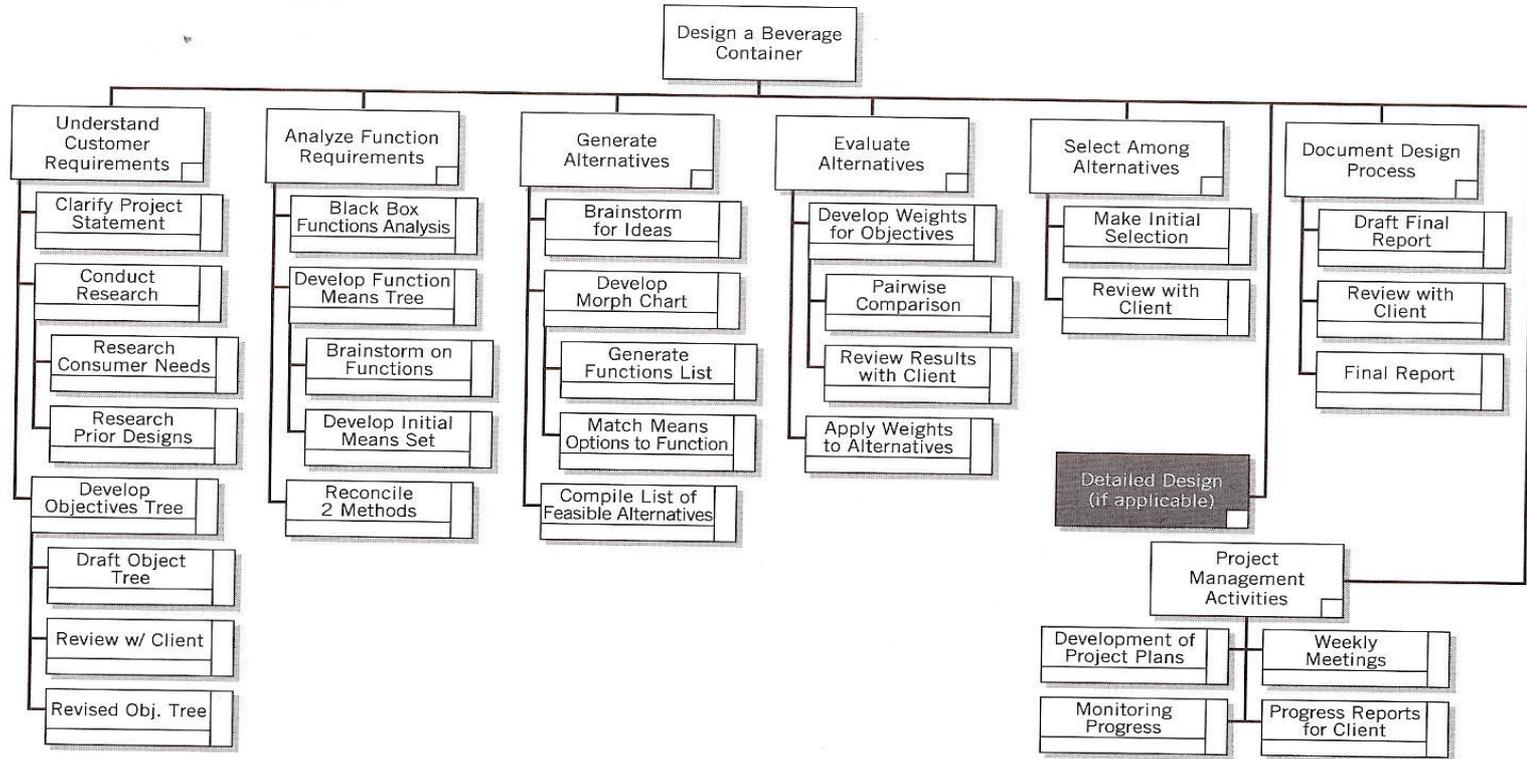


# Work Breakdown Structure

# Work Breakdown Structure (WBS)

- ▶ A hierarchical decomposition of all the tasks to be accomplished for a project to be completed.

# Beverage container WBS



**FIGURE 7.1** A work breakdown structure (WBS) for the beverage container design project. Because the design project is just beginning, the structure necessarily takes on a formal and somewhat generic framework. Note, however, that the designers are already aware of some details, such as the distinction between identifying consumer needs and prior designs.

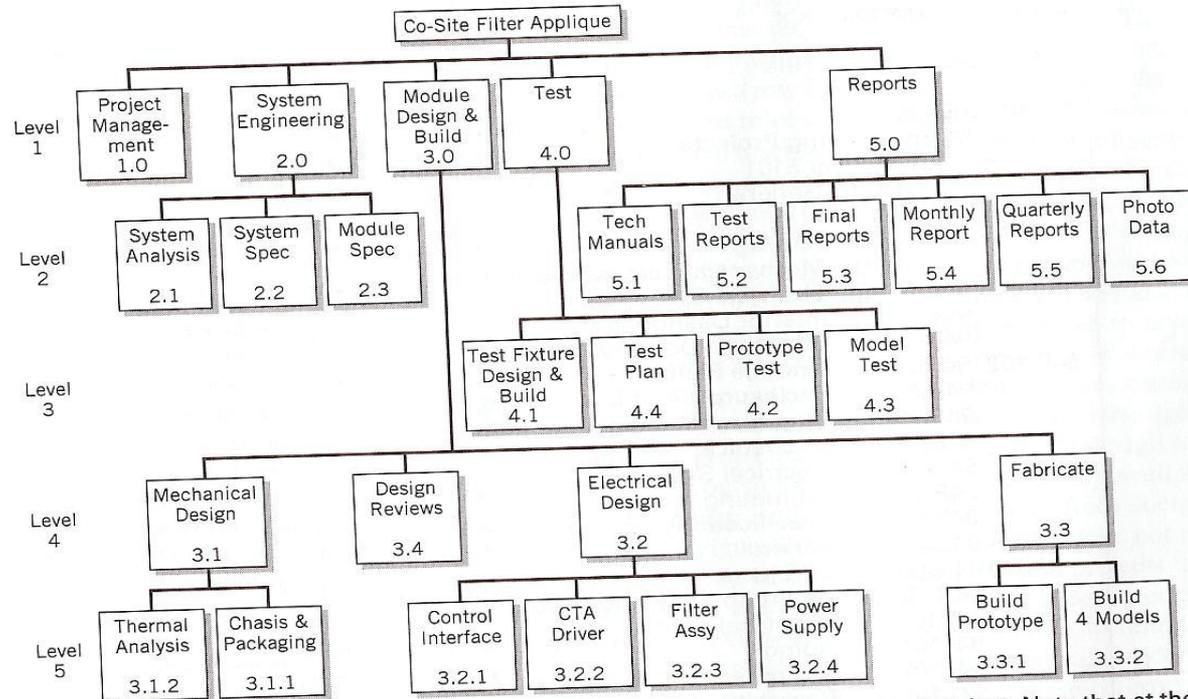
# WBS

- ▶ WBS always breaks tasks into two or more subtasks. There is no point in having a single lower level on a WBS.
- ▶ WBS should decompose tasks to manageable levels. If responsibility cannot be assigned easily, or time and other resources determined easily, then break the task down further.
- ▶ WBS should be complete. There should be no tasks which consume resources which is not on the WBS (at least by inclusion into another task.) Tasks such as reporting on or managing the project must be included.

# Criteria for complete WBS

- ▶ **Completeness:**
  - Does the WBS account for all the activities that consume resources or take time?
- ▶ **Adequacy:**
  - Are tasks broken down to an adequate level of detail, such that the project team can determine how much time will be required to complete them?

# Alternate WBS Format



**FIGURE 7.2** A work breakdown structure (WBS) for a hardware development project. Note that at the lowest level (Level 5), the electrical design tasks have been broken down to the level of the components to be designed. At this stage, the designer of the Power Supply might follow another WBS similar to Figure 7.1. (Adapted from Kezsbom, Schilling, and Edward, 1989.)

# Another alternate format

PRIMAVERA PROJECT PLANNER	
Date 08JAN98	-----WORK BREAKDOWN STRUCTURE-----
ENGR - Active Projects for the Fiscal Year	
Structure : xxx.xxx.xx.x	
WBS Code	Title
94	All Projects
94E	All Engineering Projects
94E.101	Project E101
94 E.101.A	General
94E.101.A7	
94E.101.B	Air Bag
94E.101.C	Mechanical Release System
94E.101.D	Electrical Systems
94E.101.E	Interior Dashboard
94E.101.F	Structural Door System
94E.102	Retrofit Automobile Plant
94E.102.A	Enclosure
94E.102.B	Structural System
94E.102.C	Mechanical System
94E.102.D	Electrical System
94E.102.E	Estimating
94E.102.F	Specifications
94E.102.G	General
94I	All Installation Projects
94I.101	Tooling & Equipment Installation
94I.101.A	Structural Slab
94I.101.B	Piping
94I.101.C	Equipment
94I.101.D	Electricity
94I.101.E	Interior Finishes
94I.101.F	Ventilation & Plumbing
94I.101.G	General

**FIGURE 7.3**

A work breakdown structure (WBS) for the engineering projects of an automotive firm. This nongraphical WBS organizes the firm's activities according to systems for the autos and overall factory installation projects. The level of detail is not very high, and presumably the firm would have supporting WBSs for some if not all these projects.

# Linear Responsibility Chart (LRC)

- ▶ Linear responsibility charts (LRC) show the responsibilities of each team member (and others associated with the project) in terms of the tasks and subtasks to be completed.

# LRC

- 1 Primary responsibility
- 2 Support/work
- 3 Must be consulted
- 4 May be consulted
- 5 Review
- 6 Final Approval

Linear Responsibility Chart	Team Member #1	Team Member #2	Team Member #3	Team Member #4	Team Member #5	Director of Design	Client Liaison	Client Research Director	Outside Consultant
1.0 Understand Customer Requirements	1								
1.1 Clarify Problem Statement	1	2	2	2	2		3	4	
1.2 Conduct Research	1	2		2	2		4	4	4
1.3 Develop Objectives Tree	1								4
1.3.1 Draft Objectives Tree			2	2		5	5	3	4
1.3.2 Review w/ Client	1		2			5	5	3	4
1.3.3 Revise Objectives Tree	1		2	2		6		4	
2.0 Analyze Function Requirements	2	2	1	2	2	5	4	3	3
3.0 Generate Alternatives				1					
4.0 Evaluate Alternatives	5	1	2	2	2				
4.1 Weigh Objectives	1	2				5	6		
4.2 Develop Test Protocol	5	1			2	5	4	3	3
4.3 Conduct Tests		1	2		2			5	3
4.4 Report Test Results	5	2	2		1	5	5	5	5
5.0 Select Preferred Design	1	2			2	5	6	4	4
6.0 Document Design Results		1							
6.1 Design Specifications	1			2		6			
6.2 Draft Final Report	5	1		2		5	5		4

# LRC cont

- ▶ LRC should account for at least every major task area in the WBS, and those subtasks that have different responsibility areas.
- ▶ The LRC can be used to gain “buy in” from team members and key client or other parties.
- ▶ LRC can and should be updated from time to time as workloads and responsibilities shift.

# Analysing Responsibility Charts identifies Risks

- ▶ Problem: Somebody is heavily committed.
  - Possible Project Management Issues: Not enough time to handle all duties, making too many key decisions, What if this person leaves during the project
- ▶ Problem: The project manager has no direct responsibilities
  - Issues: Will the project manager fully understand status reports?

# Analysing Responsibility Charts identifies Risks

- ▶ Problem: An activity requires many approvals
  - Issue: Does anyone else have to approve the activity. Are there too many people involved approvals? Is your estimated duration of the activity too optimistic, because the approval is out of your hands?
- ▶ After you identify an issue, you should address it in your risk management plan.