

## Work Breakdown Structure (WBS)

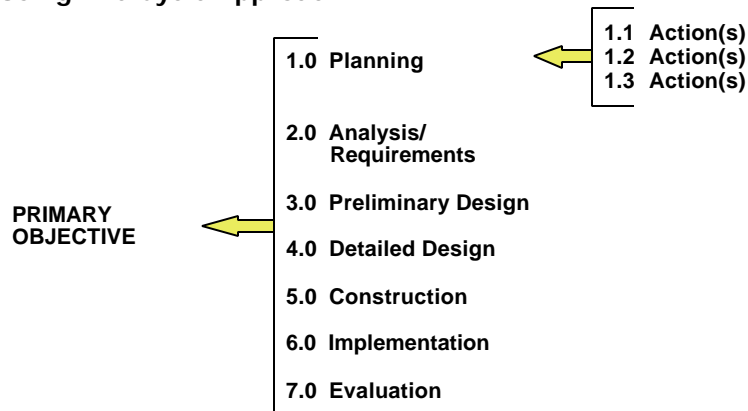
Start with the end task/prime objective  
Decompose the project into activities/events.

### ITEMS ON THE WBS ARE:

Products that must be completed before work can begin on a subsequent tasks  
Milestone deliverables to the user/client  
Project management tasks

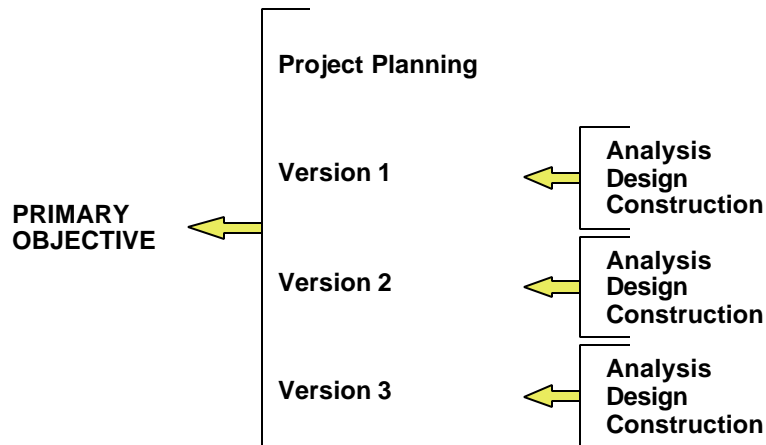
## Work Breakdown Structures

### Using Life Cycle Approach



### Using version or stage then life cycle step

- This methodology is used for projects of extended duration.

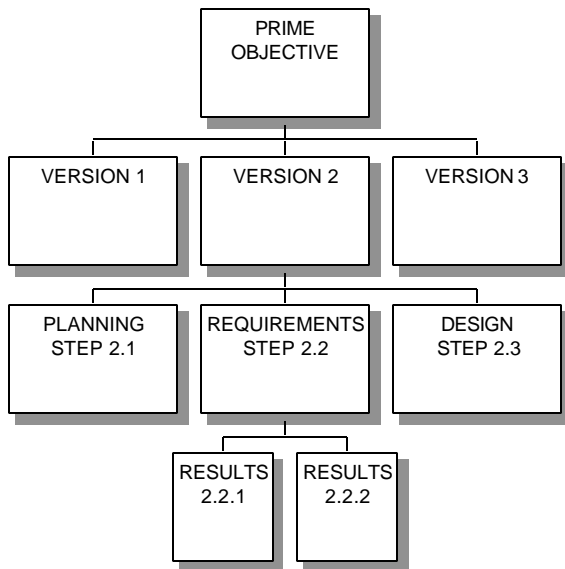


## Work Breakdown Structure Alternatives

**WORK BREAKDOWN  
STRUCTURE  
ALTERNATIVES**

1. HIERARCHY
2. OUTLINE
3. WARNIER

**ALTERNATIVE #1 – HIERARCHICAL**

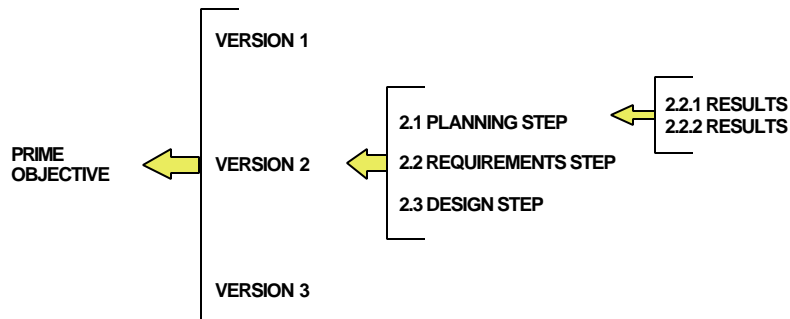


**ALTERNATIVE #2 - OUTLINE**

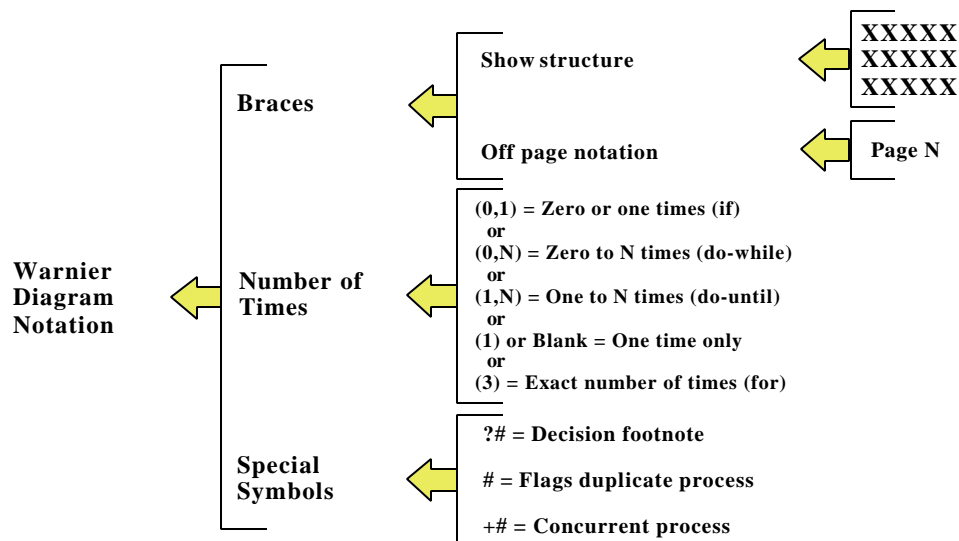
PRIME OBJECTIVE

1. VERSION 1
2. VERSION 2
  - 2.1 Planning Step
  - 2.2 Requirements Step
    - 2.2.1 Results
    - 2.2.2 Results
  - 2.3 Design Step
3. VERSION 3

**ALTERNATIVE #3: WARNIER**



## Warnier Diagram Notation



## Rules for Tools: Warnier Diagram

1. Process NAME appears to the left of the brace.
2. Process ACTION appears at the lowest level of breakdown at the right of the brace.
3. If a process breaks down into lower level processes or sub-processes, those are listed to the right.
4. The process BREAKDOWN continues until the item to the right of the brace is the ACTION that will occur.
5. The individual action or "work package" should be of sufficient detail to allow for monitoring and controlling later.
6. The Warnier Diagram is read left to right; top to bottom, in sequence. If a process has a brace to the right, the actions within that brace are completed in sequence.
7. Use Warnier Notation where appropriate to show concurrency, duplicate processes, repetition, etc.

## WBS Exercise

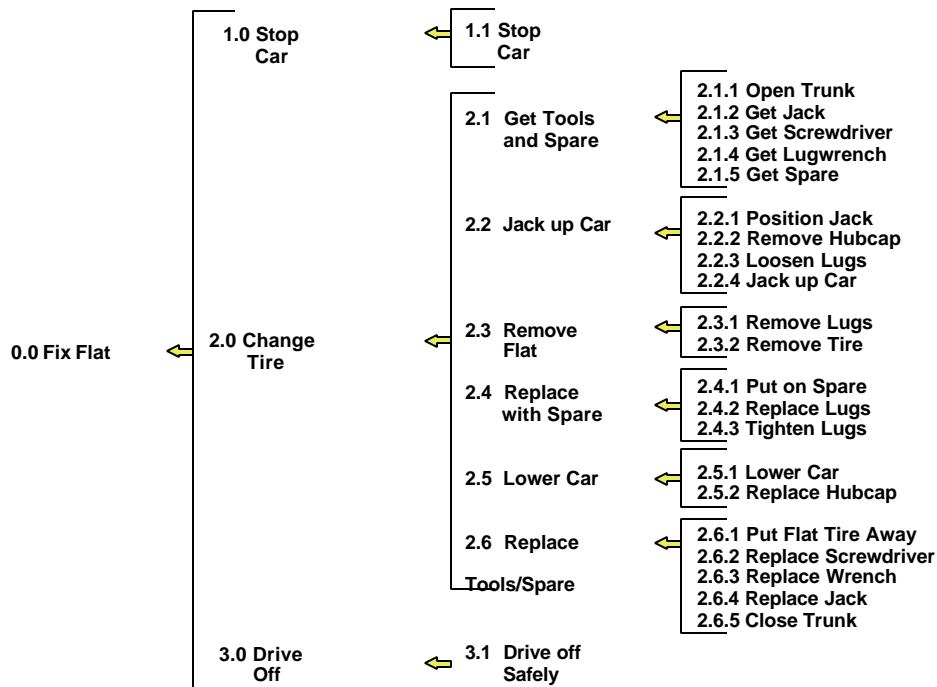
SITUATION:

You are driving a car and have just had a "blow-out". Your problem/objective is to FIX THE FLAT (change the tire) and continue on your journey safely.

Given the individual tasks/steps listed below, develop a work breakdown structure to accomplish your objective. Assume unlimited resources.

stop car	get spare tire
replace lugs	open trunk
get jack	loosen lugs
get screwdriver	position jack
put flat in trunk	remove hub cap
jack up car	remove tire
put on spare	lower car
drive off safely	tighten lugs
replace screwdriver	replace hub cap
get lug wrench	remove jack
close trunk	remove lugs
replace wrench	

### ***Flat Tire WBS Exercise - Solution***



### ***The Need for Work Breakdown***

- The Project Manager usually cannot organize or keep track of more than three (3) or possibly four (4) levels within the Work Breakdown Structure.
- The Project Leader must divide up the project, negotiate and assign the pieces to the project leaders of the organizational units which will actually do the work.
- It is the responsibility of the organizational units to detail the Work Breakdown Structure to the lowest level possible.
- The people, or unit to do the work, should finish the structure. (Don't tell them what you want here!)

### ***Tasks, Deliverables & Milestones***

Work Breakdown Tasks:

- Work packages which accomplish objective(s)

Deliverables or Results:

- Physically measurable accomplishment from a task
- Should be tied directly to walkthroughs or reviews
- Identified in the product schedule

Milestones:

- Major project dates
- Identify critical points in the projects
- Are not scheduled as frequently as deliverables
- Generally occur at the end of a series or activities

### ***Rules for Tools: Work Breakdown Structure***

1. SELECT THE WBS FORMAT OF YOUR CHOICE.
  - 1.1 Hierarchy
  - 1.2 Outline
  - 1.3 Warnier
2. DETERMINE WHAT APPROACH YOU WILL TAKE IN BREAKING DOWN YOUR PROJECT:
  - 2.1 Phased delivery or sequential order
    - 2.1.1 Project Life Cycle
    - 2.1.2 Natural Order Sequence
    - 2.1.3 Sub-objective or Major Piece
3. IDENTIFY YOUR PROJECT'S MAJOR OBJECTIVE
4. BREAKDOWN (DECOMPOSE) THE PROJECT INTO SUCCESSIVELY LOWER LEVELS OF DETAIL.
  - 4.1 Names of processes appear at the higher level.
  - 4.2 Actions only appear at the lowest level in the detailed plan.
5. REVIEW YOUR WBS:
  - 5.1 For concurrency - what tasks or actions could be done simultaneously?
  - 5.2 For dependencies - in what order or sequence must particular tasks or actions be accomplished?
6. REMEMBER THAT THE PROJECT MANAGER CAN ONLY BE KNOWLEDGEABLE OF 3 TO 5 LEVELS OF THE WBS. MORE DETAILED LEVELS MUST BE DONE BY THE PEOPLE (PERSON) RESPONSIBLE FOR, OR EXPECTED TO, ACCOMPLISH THE TASK.