Software Project Management

Lecture 9

Words of Wisdom

- Accept yourself in totality, with all the goods and evils, strengths and weakness, physique, traits, etc.
- *He it is who hath placed you as viceroys of the earth and hath exalted some of you in rank above others, that He may try you by (the test of) that which He hath given you. Lo! Thy Lord is swift in prosecution and lo! He is Forgiving, Merciful. Al-Quran (6:15).*

Tailoring A Project Plan

- The 1058 template should be tailored for each project
- All relevant parts of the plan should be covered
- Tailoring activities include:
  - deleting unneeded parts (e.g. subcontractor management)
  - modifying parts
  - including additional parts (e.g. other plans)
  - scaling plans (up / down)
    - For larger projects (> 25 people), different groups may be responsible for defining & tailoring their process plans
    - For small and medium projects, it is not a matter of what to omit, but how to scale all necessary processes to cost-effective proportions (all essential project roles and processes must be addressed, even on small projects, perhaps in a less formal way)

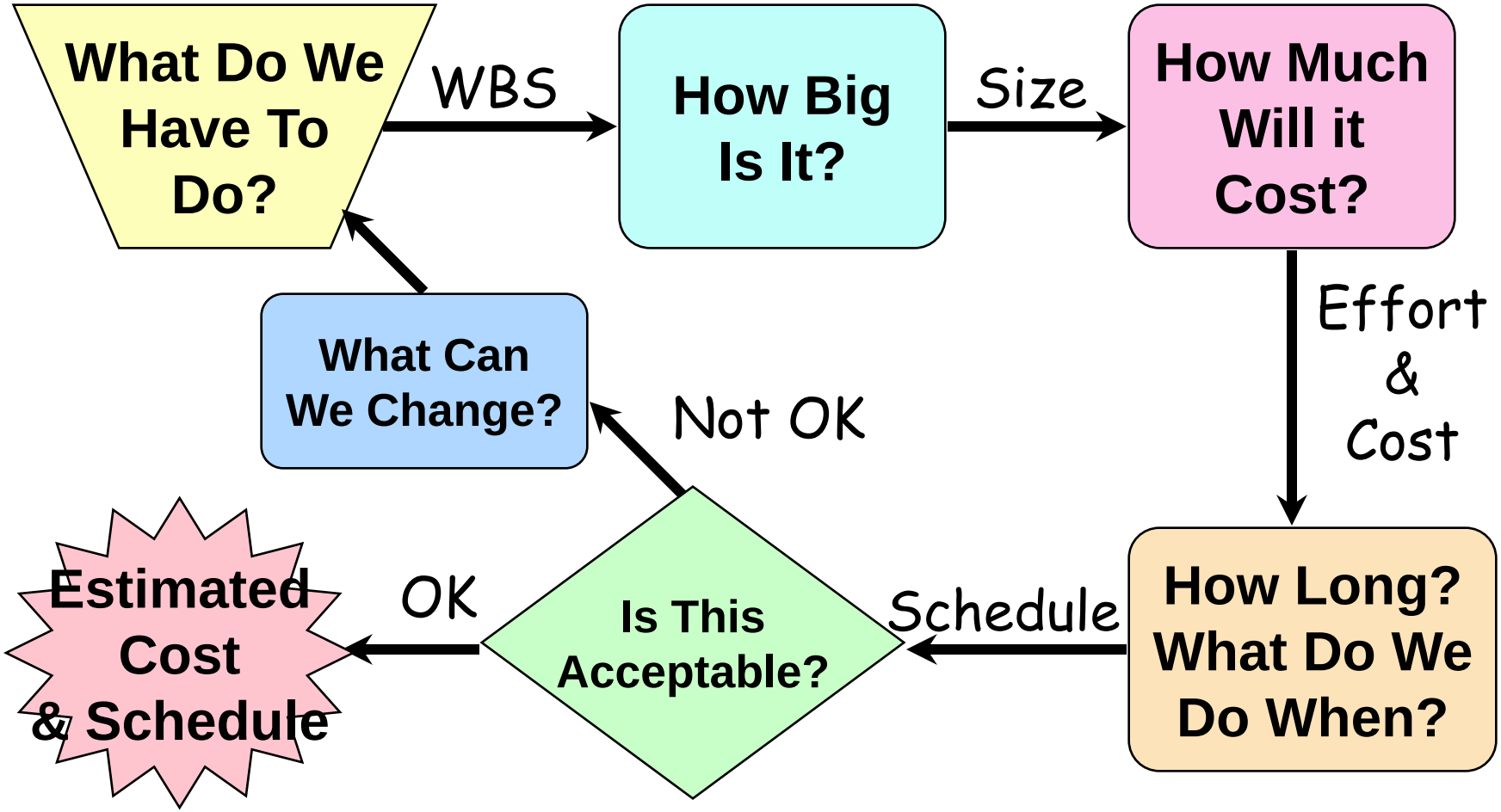
An outline of Step Wise planning activities (Huges & Cotterell)

- 1. Identify project scope and objectives
  - Identify objectives and measures of effectiveness in meeting them
  - Establish a project authority
  - Identify stakeholders
  - Modify objectives in the light of stakeholder analysis
  - Establish methods of communications with all parties
- 2. Identify project infrastructure
  - Establish relationship between project and strategic planning
  - Identify installation standards and procedures
  - Identify project team organization

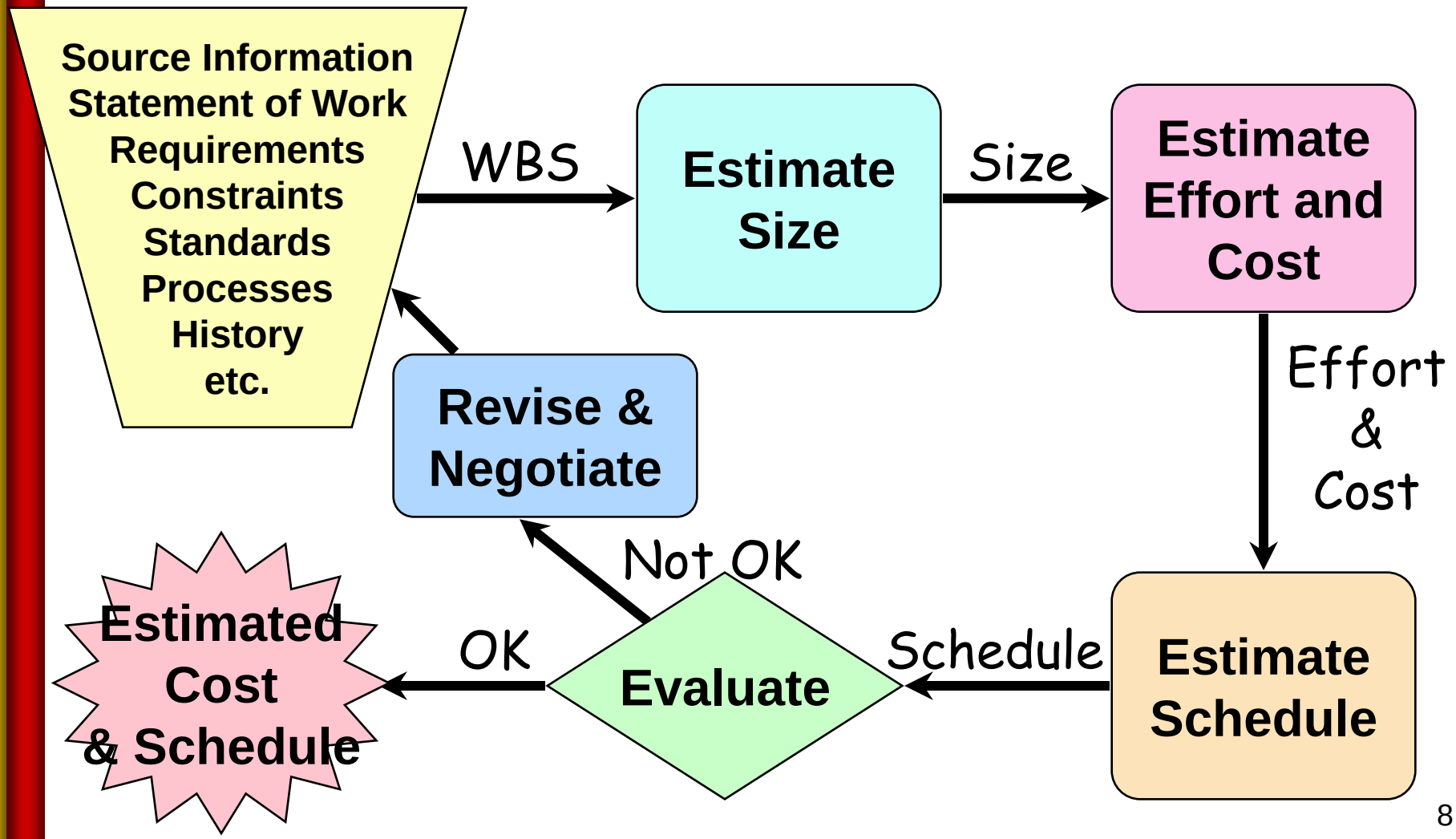
- 3. Analyze project characteristics
  - Distinguish the project as either objective or product driven
  - Analyze other project characteristics
  - Identify high-level project risks
  - Take into account user requirements concerning implementation
  - Select general life cycle approach
  - Review overall resource estimates
- 4. Identify project products and activities
  - Identify and describe project products (including quality criteria)
  - Document generic product flows
  - Recognize product instances
  - Produce ideal activity network
  - Modify ideal to take into account need for stages and checkpoints

- 5. Estimate effort for each activity
  - Carry out bottom-up estimates
  - Revise plan to create controllable activities
- 6. Identify activity risks
  - Identify and quantify activity-based risks
  - Plan risk reduction and contingency measures where appropriate
  - Adjust plans and estimates to take account of risks
- 7. Allocate resources
  - Identify and allocate resources
  - Revise plans and estimates to account for resource constraints
- 8. Review/publicize plan
  - Review quality aspects of project plan
  - Document plans and obtain agreement

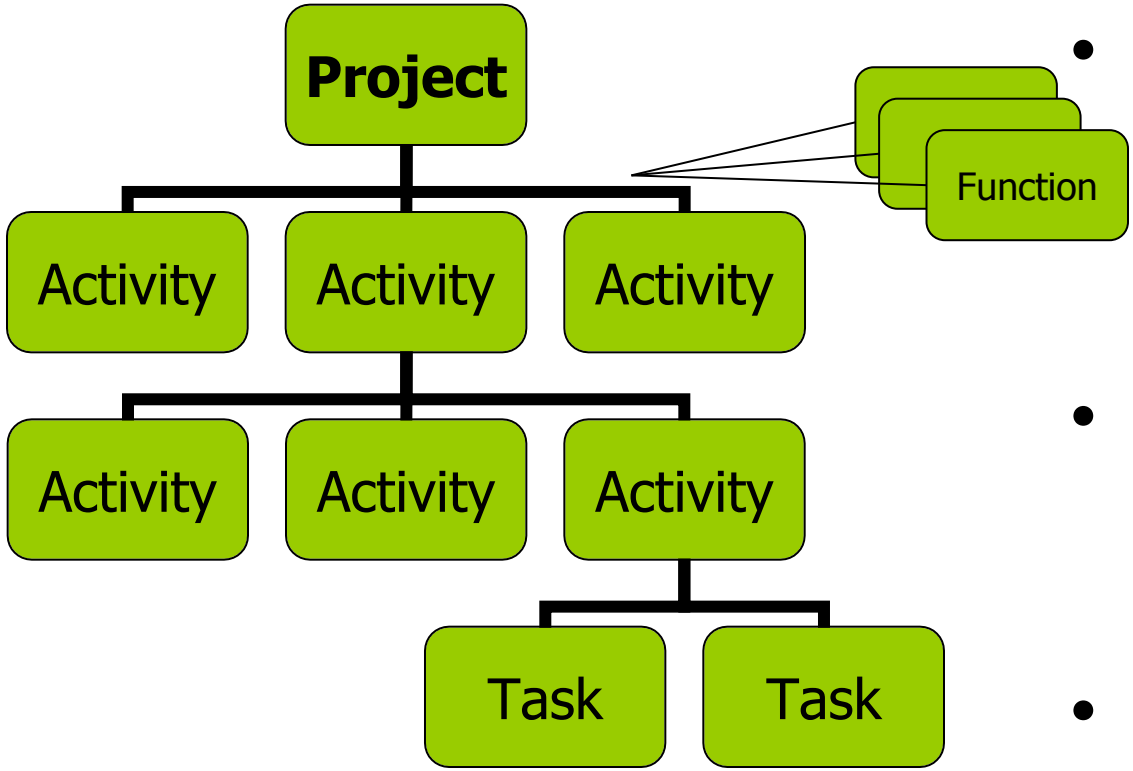
Planning Questions



Planning – Estimates & Schedule



Project Elements

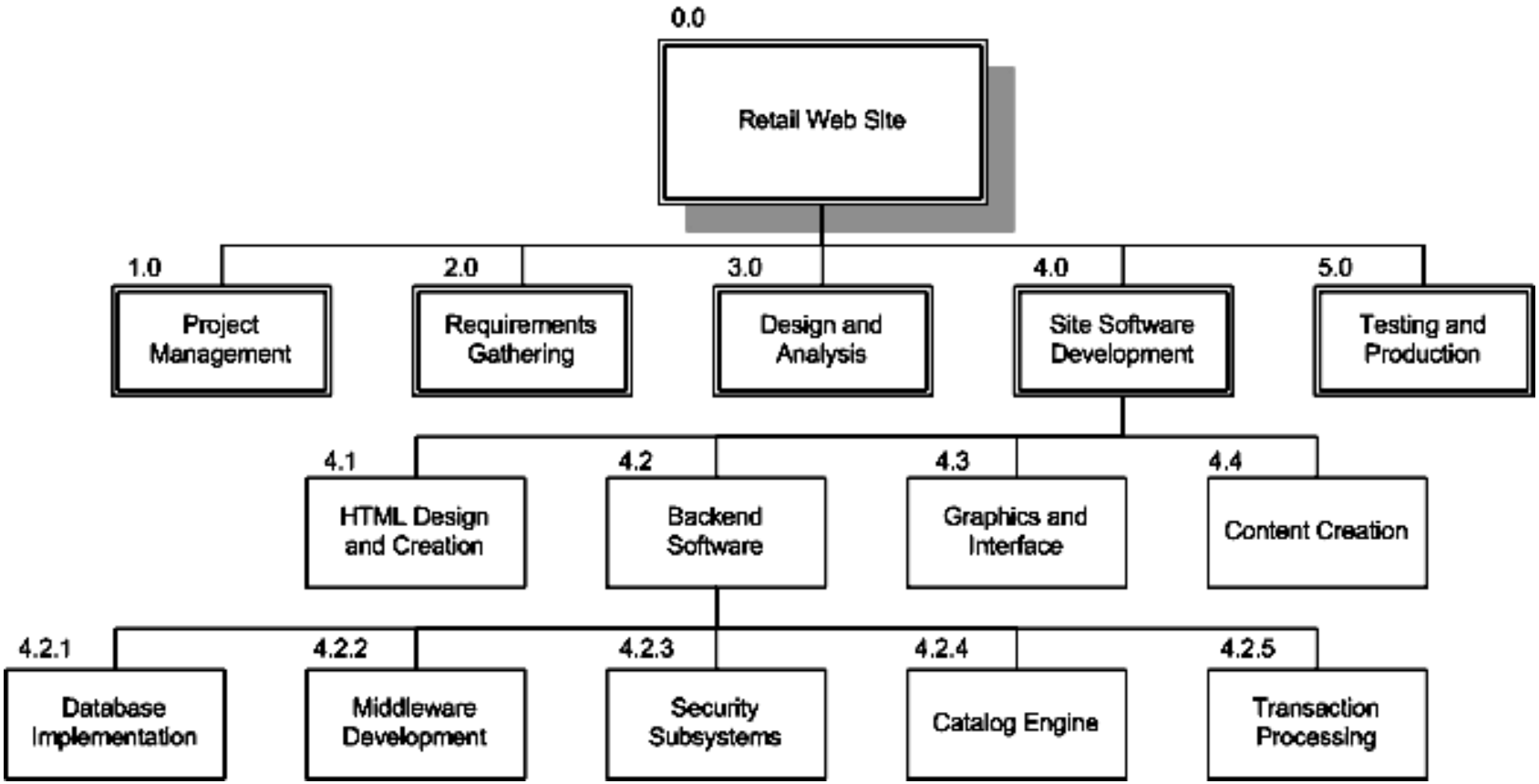


- **Function**
  - **Management Activity**
  - **Duration – Project Life**
    - **Risk Management**
    - **Configuration Management**
- **Activity**
  - **An element of work with expected duration, cost, and resources**
- **Task**
  - **Lowest level of work**
  - **No shown on WBS**

Work Breakdown Structure: WBS

- Hierarchical list of project's work activities
  - List of Activities, not Things
- 2 Formats
  - Outline (indented format)
  - Graphical Tree (Organizational Chart)
- Uses a decimal numbering system
  - e.g., 3.1.5
  - 0 is typically top level
- Includes
  - Development, management, and project support activities
- Shows "is contained in" relationships
- Does not show dependencies or durations

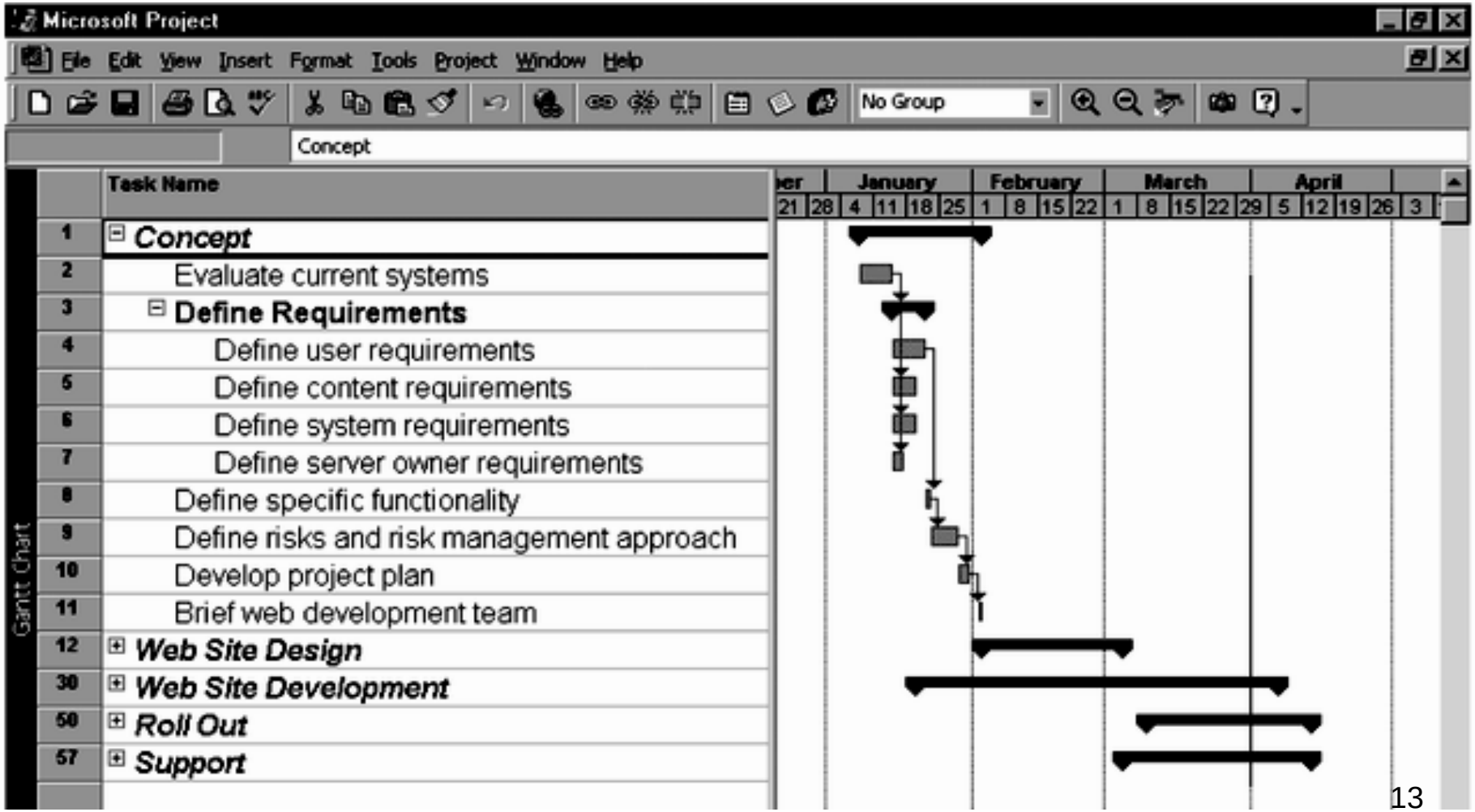
WBS Chart Example



WBS Outline Example

0.0 Retail Web Site
1.0 Project Management
2.0 Requirements Gathering
3.0 Analysis & Design
4.0 Site Software Development
    4.1 HTML Design and Creation
    4.2 Backend Software
        4.2.1 Database Implementation
        4.2.2 Middleware Development
        4.2.3 Security Subsystems
        4.2.4 Catalog Engine
        4.2.5 Transaction Processing
    4.3 Graphics and Interface
    4.4 Content Creation
5.0 Testing and Production

Outline WBS w/Gantt



Why do we require a Work Breakdown Structure?

- To organize the work to be done
- To illustrate the work to be done
- To assure that all necessary work has been identified
- To divide the work into small, well defined tasks
- To facilitate planning, estimating and scheduling of the project
- To provide a basis for data monitoring and historical data collection
- To identify contractual tasks and deliverables

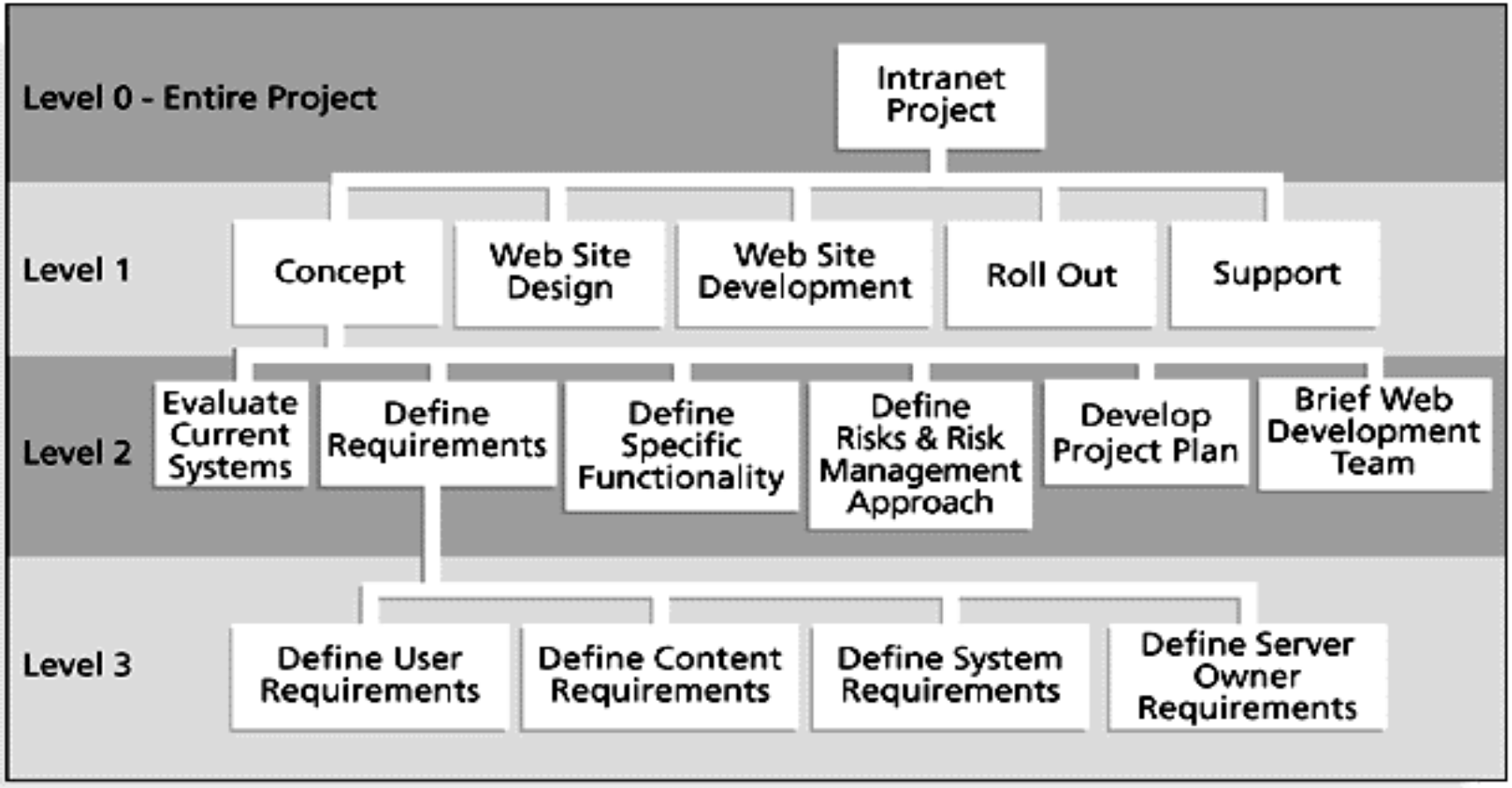
Why WBS

- Cost estimating
  - To make sure all activities get estimated
  - To make sure that each element of the estimate corresponds to a necessary activity
  - To “roll up” costs of individual elements into total costs for sub-elements and for the system as a whole
- Cost accounting
  - To assign work and “charge it” to appropriate cost centers based on specific WBS elements
  - To determine the actual cost of each element
- Schedule performance
  - To monitor which activities are complete
  - To measure project progress

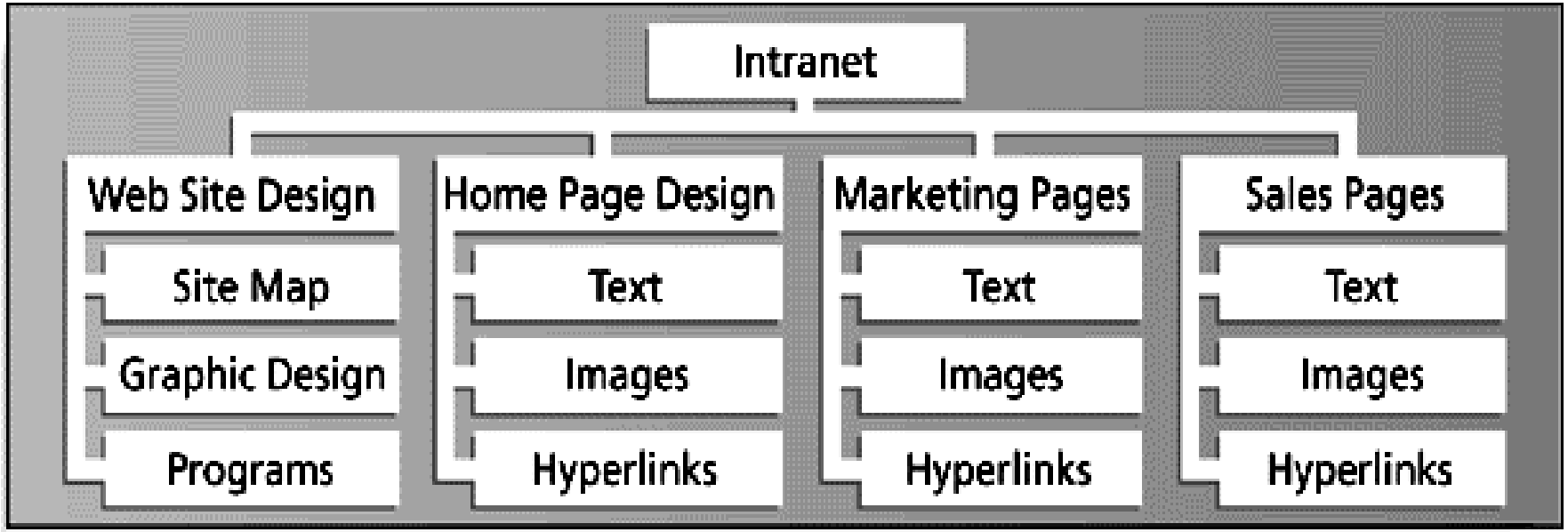
WBS Types

- Process WBS
  - a.k.a. Activity-oriented
  - e.g., Requirements, Analysis, Design, Testing
  - Typically used by PM
- Product WBS
  - a.k.a. Entity-oriented
  - e.g., Financial engine, Interface system, DB
  - Typically used by engineering manager

Process WBS


Level 0 - Entire Project
Intranet Project
Level 1
Concept
Web Site Design
Web Site Development
Roll Out
Support
Level 2
Evaluate Current Systems
Define Requirements
Define Specific Functionality
Define Risks & Risk Management Approach
Develop Project Plan
Brief Web Development Team
Level 3
Define User Requirements
Define Content Requirements
Define System Requirements
Define Server Owner Requirements

Product WBS


Intranet
Web Site Design
Site Map
Graphic Design
Programs
Home Page Design
Text
Images
Hyperlinks
Marketing Pages
Text
Images
Hyperlinks
Sales Pages
Text
Images
Hyperlinks

WBS Types

- Less frequently used alternatives
- Organizational WBS
  - Research, Product Design, Engineering, Operations
  - Can be useful for highly cross-functional projects
- Geographical WBS
  - Can be useful with distributed teams
  - ISB team, NYC team, MAN team

Work Packages

- Generic term for discrete **tasks** with definable end results
- Typically the “leaves” on the tree
- The “one-to-two” rule
    - Often at: 1 or 2 persons for 1 or 2 weeks
- Basis for monitoring and reporting progress
    - Can be tied to budget items (charge numbers)
    - Resources (personnel) assigned
- For software development project correspond to the lowest identifiable objects or modules to be created in a deliverable system

WBS Techniques

- Top-Down
- Bottom-Up
- Analogy
- Rolling Wave
  - 1st pass: go 1-3 levels deep
  - Gather more requirements or data
  - Add more detail later
- Post-its on a wall

WBS Techniques - Top-down

- Start at highest level
- Systematically develop increasing level of detail
- Best if
  - The problem is well understood
  - Technology and methodology are not new
  - This is similar to an earlier project or problem
- But is also applied in majority of situations

WBS Techniques - Bottom-up

- Start at lowest level tasks
- Aggregate into summaries and higher levels
- Cons
  - Time consuming
  - Needs more requirements complete
- Pros
  - Detailed

WBS Techniques - Analogy

- Base WBS upon that of a “similar” project
- Use a template
- Analogy also can be estimation basis
- Pros
  - Based on past actual experience
- Cons
  - Needs comparable project

WBS Techniques - Brainstorming

- Generate all activities you can think of that need to be done
- Group them into categories
- Both Top-down and Brainstorming can be used on the same WBS
- Remember to get the people who will be doing the work involved (buy-in matters!)

Q&A