

# Software Project Management

Lectures 6-9

## Today's Lecture

- Developing Work-breakdown structure
- Estimating size of a software
- Developing Budgets and Schedules

2

## Difference between Planning, Estimating, Scheduling

- difference?
- Plan: Identify activities.
- Estimating:
  - Determine size of activities
  - duration of activities.
- Schedule:
  - specific start and end dates,
  - relationships,
  - and resources.

3

## How To Schedule

- 1. Identify
  - what needs to be done
  - how much (the size)
  - the dependency between tasks
    - Dependency graph, network diagram
  - duration of the work to be done
  - The actual schedule

4

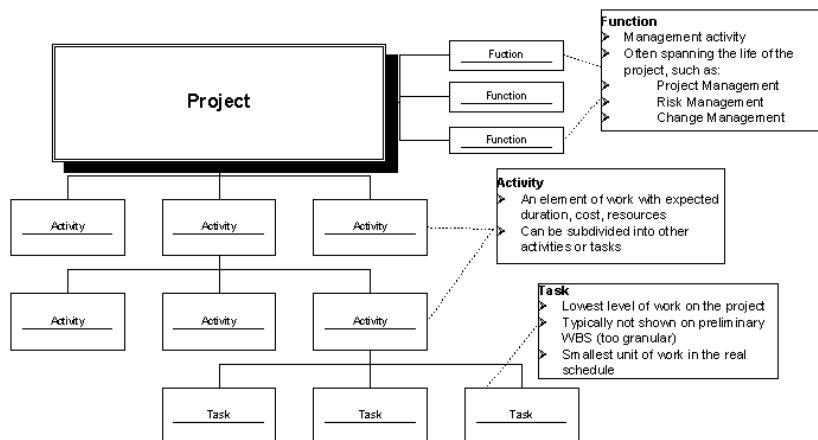
## Project Considerations

- Which activities are within the project boundaries, e.g.,
  - infrastructure setup?
- What are the project assumptions
  - E.g., Resources expected: equip/people, approvals
  - Availability of partners, connections
- Delineate key limits:
  - System load: expect a maximum of 100 users

5

## Project Elements

- A Project: functions, activities, tasks



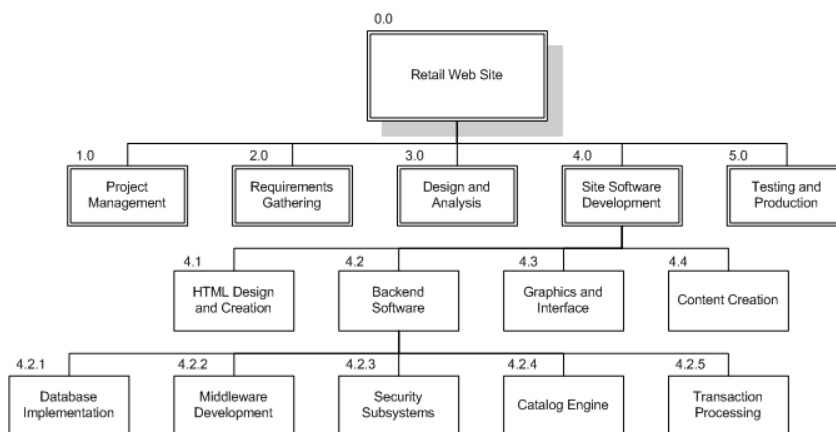
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## Work Breakdown Structure: WBS

- Hierarchical list of project's work activities
- 2 Formats
  - Outline (indented format)
  - Graphical Tree (Organizational Chart)
- Decimal numbering system
  - Ex: 3.1.5
  - 0 is typically top level
- Includes
  - Development, Mgmt., and project support tasks
- Shows “is contained in” relationships
- Does not show dependencies or durations

7

## WBS Chart Example (Style – 1)



8

## WBS Outline Example – Descriptive Style

- 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

9

## WBS Types

- **Process WBS**
  - Activity-oriented
  - Ex: Requirements, Analysis, Design, Testing
  - Typically used by PM
- **Product WBS**
  - Entity-oriented
  - Ex: Financial engine, Interface system, DB
  - Typically used by engineering manager
- **Hybrid WBS: both above**
  - Not unusual
  - Ex: Lifecycle phases at high level with component or feature-specifics within phases
  - Rationale: processes produce products

10

## WBS Techniques

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

11

## WBS – Basis of Many Things

- Network scheduling
- Costing
- Risk analysis
- Organizational structure
- Control
- Measurement

12

## WBS Guidelines

- Use corporate standards if available
- Use of lessons learnt e.g., what often hurts most is what's missing
- Break down until accurate time & cost estimates are easy to conceive
- Ensure each element has a associated deliverable

13

## Worked Example

### Background Information

#### Outline Client Brief

The clients wish to extend their property by building rooms into the roof space. They have liaised with the local council and neighbours on the appropriateness of their plans. They have commissioned an architect to produce the drawings and to get planning / building regulations approval. The clients are interested in reducing their carbon footprint (and their energy bills). The clients are also concerned that the building works will not cause too much disturbance to their garden as they wish to enter the "Gardens in Bloom" competition later in the year.

#### Notification to neighbours written by the client

*Dear Neighbours*

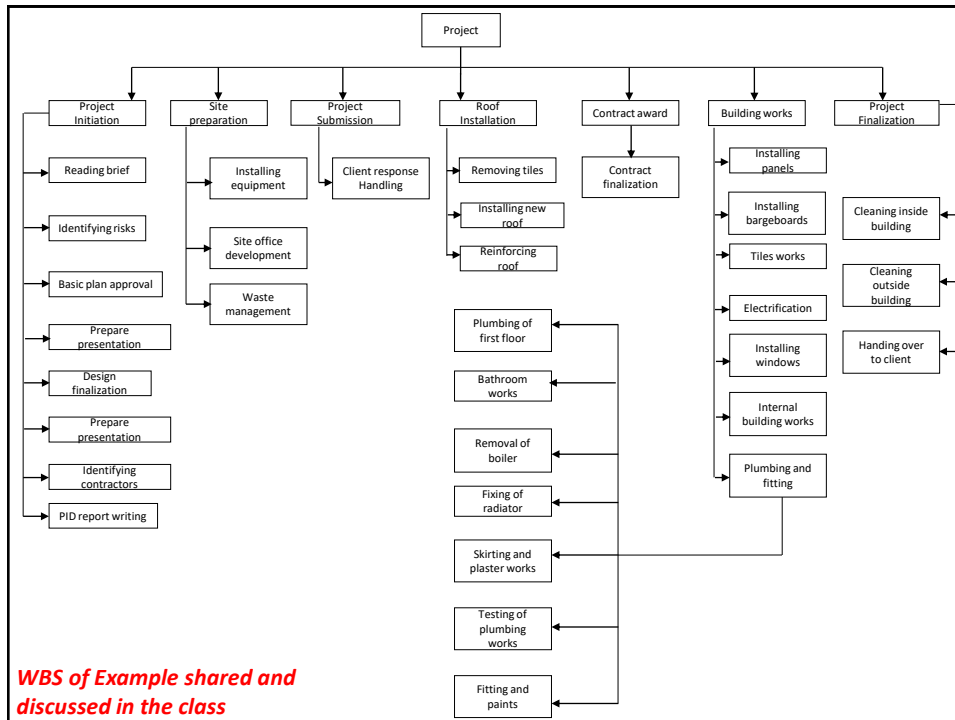
*It is our intention to extend our house by adding rooms in our roof space, with consequential alterations to the roof line. We are consulting with an architect and the Building Control Department at Littleworthingham Council to ensure that the work is carried out to the correct technical requirements and that the design meets with the Councils expectations for this area.*

*Once outline design approval has been obtained we will show you the plans and discuss the impact of the building works with you (site access, noise etc.)*

*Yours*

*Mr & Mrs S T Harter*

*Taken from web resources*



## Summery

- Considerations for WBS development
- Tools and techniques for WBS
- General guidelines