

Project Management

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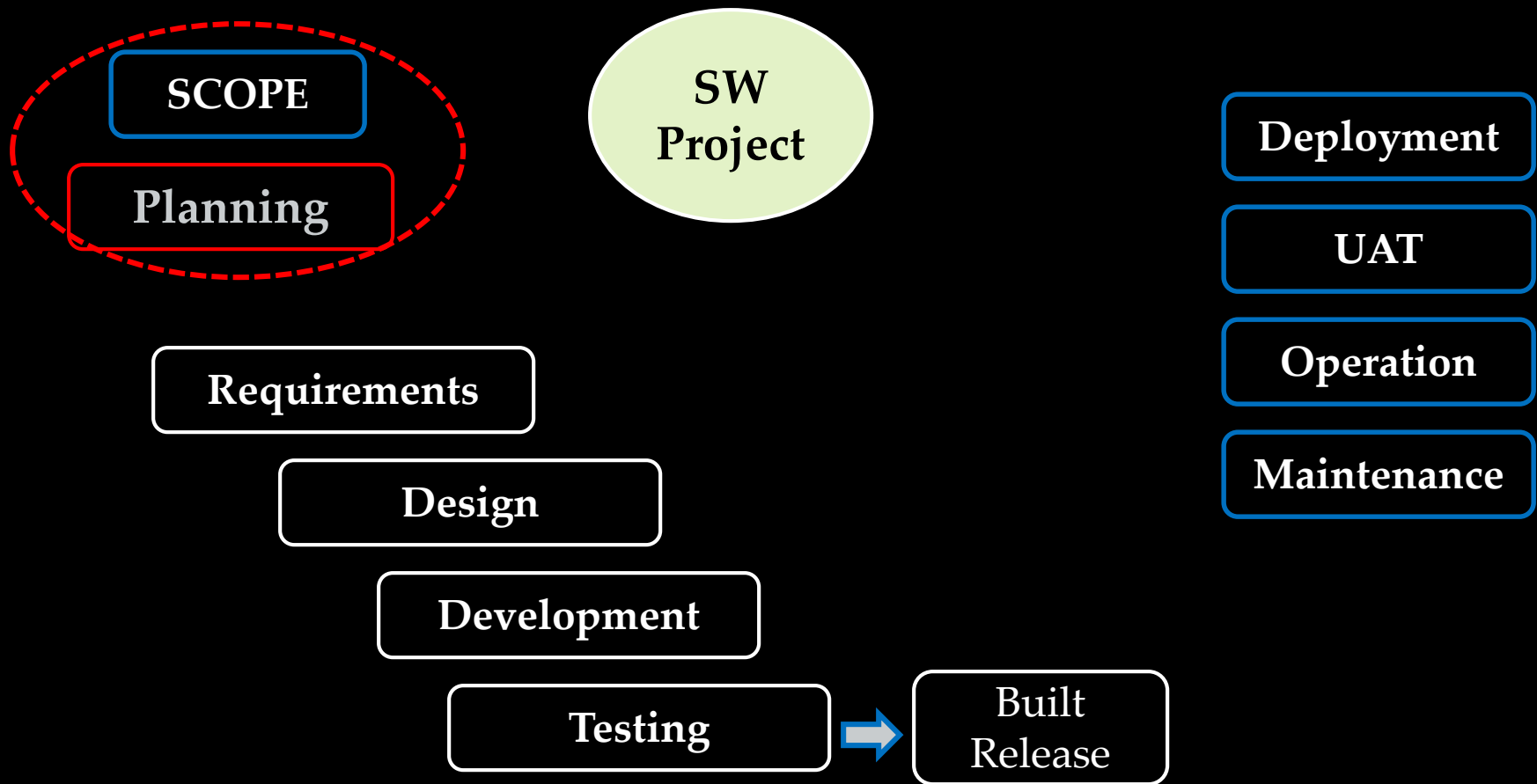
Intro to Software Engineering SE-110



Today's Outline

- What is project?
- What is Management?
- Project Management
- Software Project Management(SPM)
- Project Management activities
 - Project planning
 - Project scheduling
 - Risk management

SDLC



What is not Project?

- It seems that everything we do is a project.
- A project is different from day-to-day business.
- Ongoing work effort is generally a repetitive process because it follows an organization's existing procedures.
- Any routine work is NOT a project.
 - Coming to university on regular basis is not a project.
 - Monthly/weekly grocery shopping is not a project.
 - Production of cars at automobile factory is not a project.
 - Conducting classes at University is not a project.

Project Concepts

It is a project when it meets the following criteria;

1. Any non-repetitive activity.
2. A temporary endeavor undertaken to create a unique product or service so require resources.
3. Any activity with a start and a finish. (Temporary)
4. A unique set of co-ordinated activities, undertaken by an individual or team to meet specific objectives within defined schedule, cost and performance parameters. *Project should have a primary customer/sponsor.*

What is Management?

- It is a set of activities undertaken by one or more persons for the purpose of planning & controlling the activities of others in order to achieve an objective or complete the project.

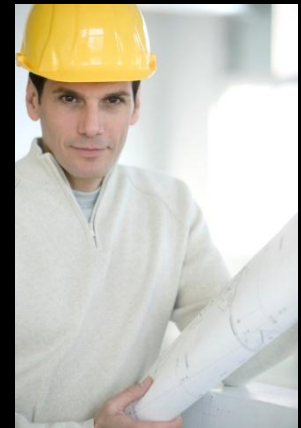


What is Project Management?

- Project management is “the application of knowledge, skills, tools and techniques to project activities to meet the project requirements”.
- PM is the one who is responsible for establishing a communication in between the project team and the user.
- Project Manager and his/her team should collectively possess the necessary and requisite inter-personal and technical skills to facilitate control over the various activities within the project.

Project Manager Role

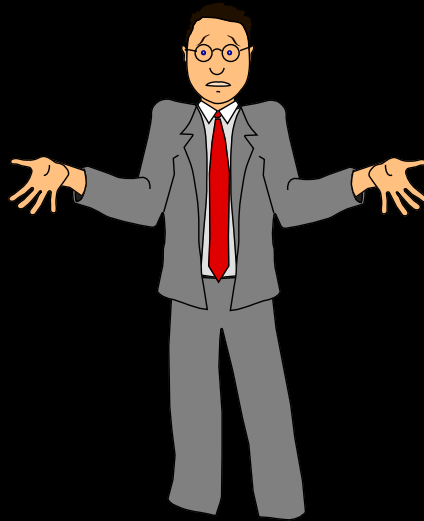
- **A Good Project Manager**
 - Takes ownership of the whole project
 - Is proactive not reactive
 - Adequately plans the project
 - Is Authoritative (NOT Authoritarian)
 - Is Decisive
 - Is a Good Communicator
 - Manages by data and facts not uniformed optimism
 - Leads by example
 - Has sound Judgement
 - Is a Motivator
 - Is Diplomatic



Software Project Issues

- Project management is needed because software development is always subject to budget and schedule constraints that are set by the organisation developing the software.
- Almost 70% of software organization have no defined engineering methods
- Software ends up
 - Late
 - Over budget
 - Fails to meet requirements
 - In a 1998 survey, 26% of software projects failed outright, 46% experienced cost and schedule overruns
- The major reason of these software projects are not technical problems, but management problems”

Project Management....



Work Smart Not Hard !!!

Software Management Distinctions

- The product is intangible.
- The product is uniquely flexible.
- Software engineering is not recognized as an engineering discipline with the same status as mechanical, electrical engineering, etc. The software development process is not standardised.
- Many software projects are 'one-off' projects.

4 P'S OF PROJECT MANAGEMENT

People



Product



Operation

Process



Project

The Management Spectrum

- **Effective software project management focuses on these items (in this order)**
 - **The people**
 - Deals with the cultivation of motivated, highly skilled people
 - Consists of the stakeholders, the team leaders, and the software team
 - **The product**
 - Product objectives and scope should be established before a project can be planned
 - **The process**
 - The software process provides the framework from which a comprehensive plan for software development can be established
 - **The project**
 - Planning and controlling a software project is done for one primary reason

Project Staffing

- May not be possible to appoint the ideal people to work on a project
 - Project budget may not allow for the use of highly-paid staff;
 - Staff with the appropriate experience may not be available;
 - An organisation may wish to develop employee skills on a software project.
- Managers have to work within these constraints especially when there are shortages of trained staff.

What is planning?



Planning is the process of stating objectives and then determining the most effective activities or accomplishments necessary to reach the objectives



Who makes the plans?



Everybody must plan



Project manager initiate the planning process



Project manager coordinates planning activities into the overall project master plan

Characteristics of a project planner



Flexible



Creative



Responsive



Communicative



Analytic

Planning Process



Devising and
maintaining a
workable scheme to
accomplish the
business need that
the project was
undertaken to
address

Project Planning

- Adequate planning leads to the correct completion of work



Planning

- Inadequate planning leads to frustration towards the end of the project & poor project performance



Project Start



Project End

Project Planning

- Probably the most time-consuming project management activity.
- Continuous activity from initial concept through to system delivery. Plans must be regularly revised as new information becomes available.
- Various different types of plan may be developed to support the main software project plan that is concerned with schedule and budget.

Project Planning Process

```
Establish the project constraints
Make initial assessments of the project parameters
Define project milestones and deliverables
while project has not been completed or cancelled loop
    Draw up project schedule
    Initiate activities according to schedule
    Wait ( for a while )
    Review project progress
    Revise estimates of project parameters
    Update the project schedule
    Re-negotiate project constraints and deliverables
    if ( problems arise ) then
        Initiate technical review and possible revision
    end if
end loop
```

Types of Project Plan

Plan	Description
Quality plan	Describes the quality procedures and standards that will be used in a project. See Chapter 27.
Validation plan	Describes the approach, resources and schedule used for system validation. See Chapter 22.
Configuration management plan	Describes the configuration management procedures and structures to be used. See Chapter 29.
Maintenance plan	Predicts the maintenance requirements of the system, maintenance costs and effort required. See Chapter 21.
Staff development plan.	Describes how the skills and experience of the project team members will be developed. See Chapter 25.

The Software Development Plan /Project Plan

- This is usually what is meant by a project plan.
- Specifies the order of work to be carried out, resources, responsibilities, and so on.
- The project plan sets out:
 - The work breakdown;
 - The resources available to the project;
 - A schedule for the work.

Project Plan Structure

- Introduction.
- Project organisation.
- Risk analysis.
- Hardware and software resource requirements.
- Work breakdown.
- Project schedule.
- Monitoring and reporting mechanisms.

Work Breakdown Structure (WBS)

- The Work Breakdown Structure is the foundation for effective project planning, costing and management.
- It is the most important aspect in setting-up a Project
- A Work Breakdown Structure (WBS) is a hierarchical (from general to specific) tree structure of deliverables and tasks that need to be performed to complete a project.”

■ It is the foundation on which everything else builds



5 reasons to create a Work Breakdown Structure

- It helps with correct project organization.
- Assists in describing the project scope to stakeholders.
- Helps to distribute responsibilities.
- Shows the project's milestones and all the points to control.
- Allows estimating costs, risks and time correctly.

WBS

- There are many ways of breaking down the activities in a project, but the most usual is into:
- work packages;
- tasks;
- deliverables;
- milestones.

WBS

- A work package is a large, logically distinct section of work:
 - typically at least 12 months duration;
 - may include multiple concurrent activities;
 - independent of other activities;
 - but may depend on, or feed into other activities;
 - typically allocated to a single team.
- A task is typically a much smaller piece of work: A part of a work package.
- typically 3–6 person months effort;
- may be dependent on other concurrent activities;
- typically allocated to a single person.

WBS

- A deliverable is an output of the project that can meaningfully be assessed.
- Examples:
 - a report (e.g., requirements spec);
 - code (e.g., alpha tested product).
- Deliverables are indicators (but only indicators) of progress.
- A milestone is a point at which progress on the project may be assessed.
- Typically a major turning point in the project.
- EXAMPLES:
 - delivery of requirements spec;
 - delivery of alpha tested code.

WBS

- Usually. . .
- work packages are numbered WP1, WP2, . . . ;
- tasks are numbered T1.1, T1.2, etc,
 - the first number is the number of the workpackage;
 - the second is a sequence number.
- deliverables are numbered D1.1, D1.2, etc
- milestones are numbered M1, M2 etc.

Steps to build a WBS

- **Begin with the Charter, focusing on Objectives and Deliverables**
- **Break the main product(s) down into sub-products**
- **Set the structure to match how you'll manage the project**
- **Lowest level not too detailed, not too large**
- **Is there a need for Integration?**
- **Identify support activities**
- **Check for completeness - is all the effort included?**
- **Develop a coding structure if needed**
- **Assign work package managers**

Displaying the WBS

Example of outlined WBS.

Project Name	Task 1	Subtask 1.1	Work Package 1.1.1
			Work Package 1.1.2
		Subtask 1.2	Workpackage 1.2.1
			Workpackage 1.2.2
	Task 2		
		Subtask 2.1	
			Workpackage 2.1.1
			Workpackage 2.1.2

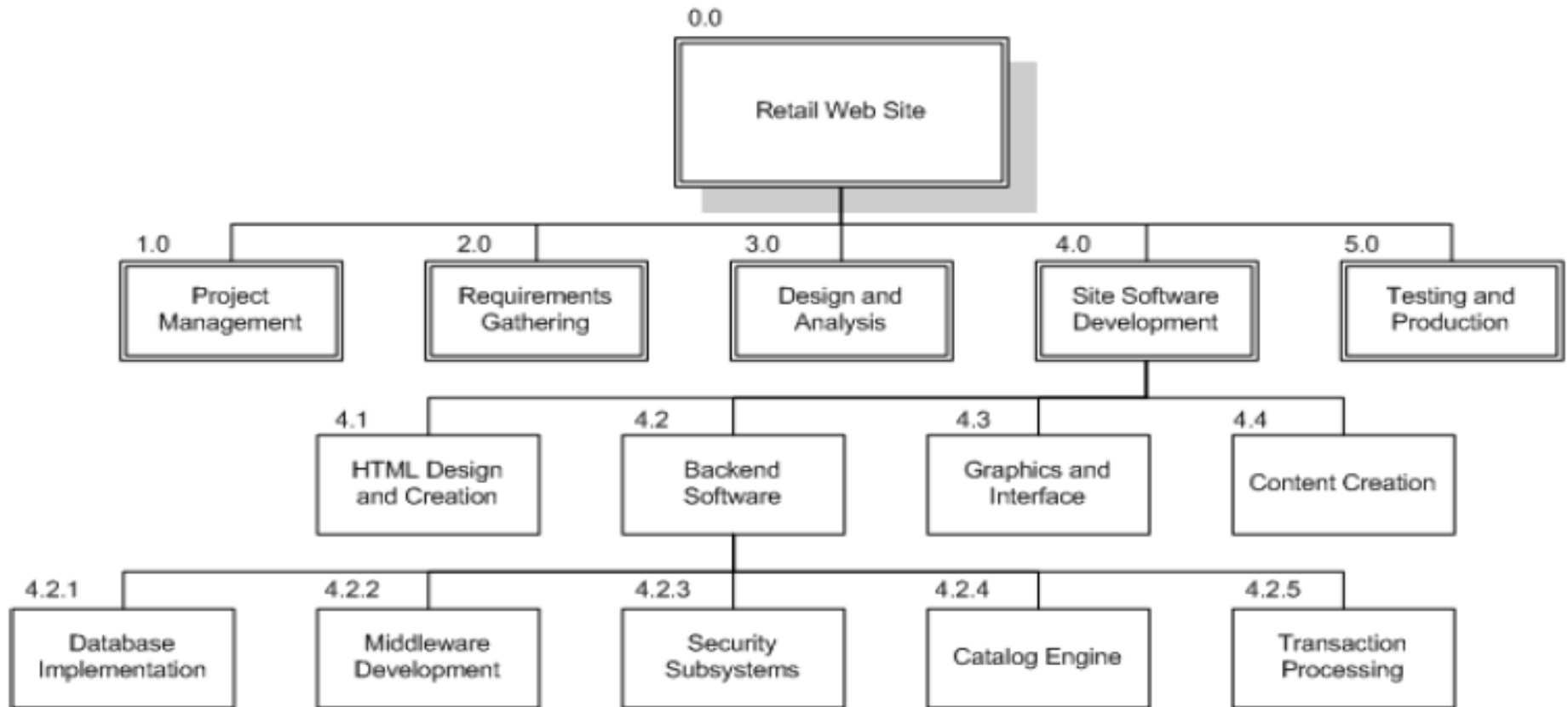
Displaying the WBS

Example of outlined WBS.

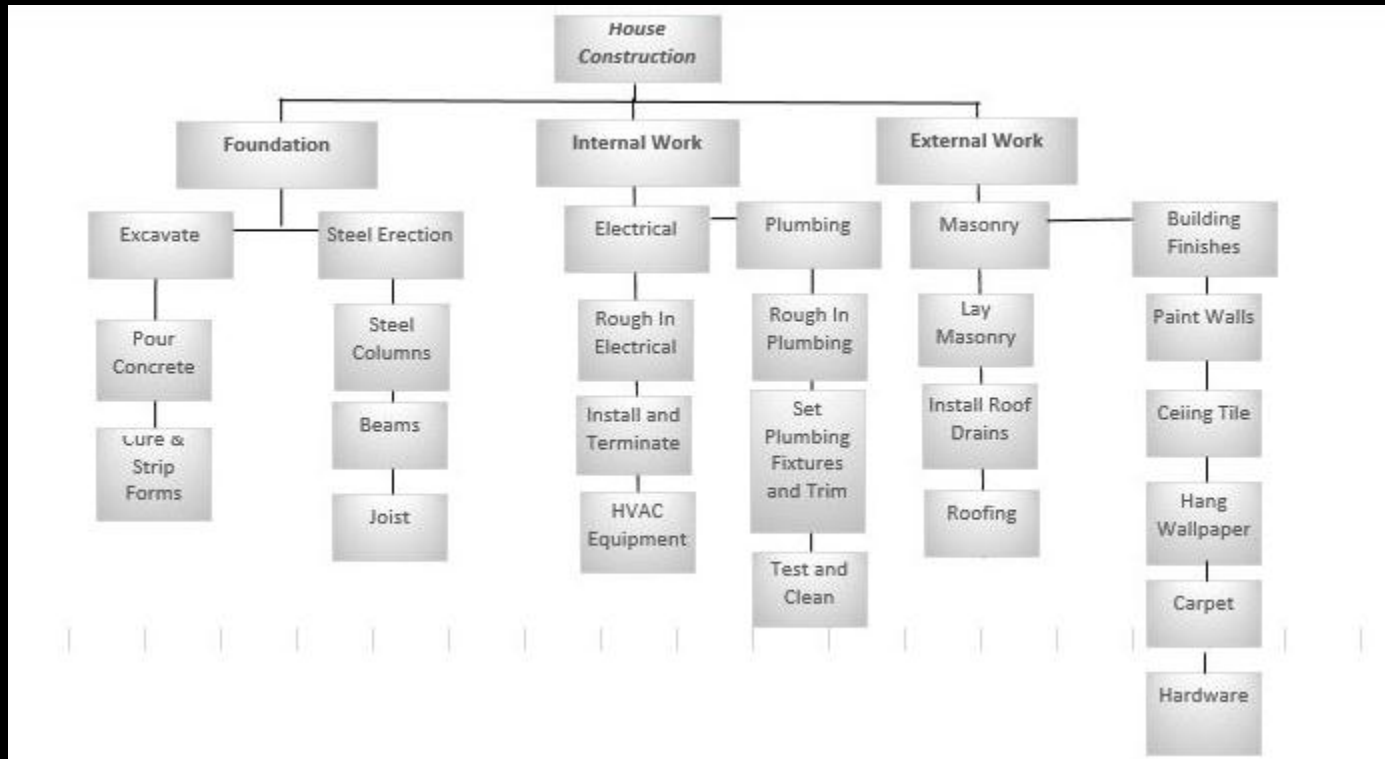
- 0.0 Retail Web Site
 - 1.0 Project Management
 - 2.0 Requirements Gathering
 - 3.0 Analysis & Design
 - 4.0 Site Software Development
 - 4.1 HTML Design and Creation
 - 4.2 Backend Software
 - 4.2.1 Database Implementation
 - 4.2.2 Middleware Development
 - 4.2.3 Security Subsystems
 - 4.2.4 Catalog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

Displaying the WBS

Example of Chart WBS.



WBS– House Construction



Example WBS

- **Redecorate Room**
 - **Prepare materials**
 - Buy paint
 - Buy a ladder
 - Buy brushes/rollers
 - Buy wallpaper remover
 - **Prepare room**
 - Remove old wallpaper
 - Remove detachable decorations
 - Cover floor with old newspapers
 - Cover electrical outlets/switches with tape
 - Cover furniture with sheets
 - **Paint the room**
 - **Clean up the room**
 - Dispose or store left over paint
 - Clean brushes/rollers
 - Dispose of old newspapers
 - Remove covers



That is all