Software Engineering
CS-303

Work Breakdown Structure (WBS)

Lecture # 15
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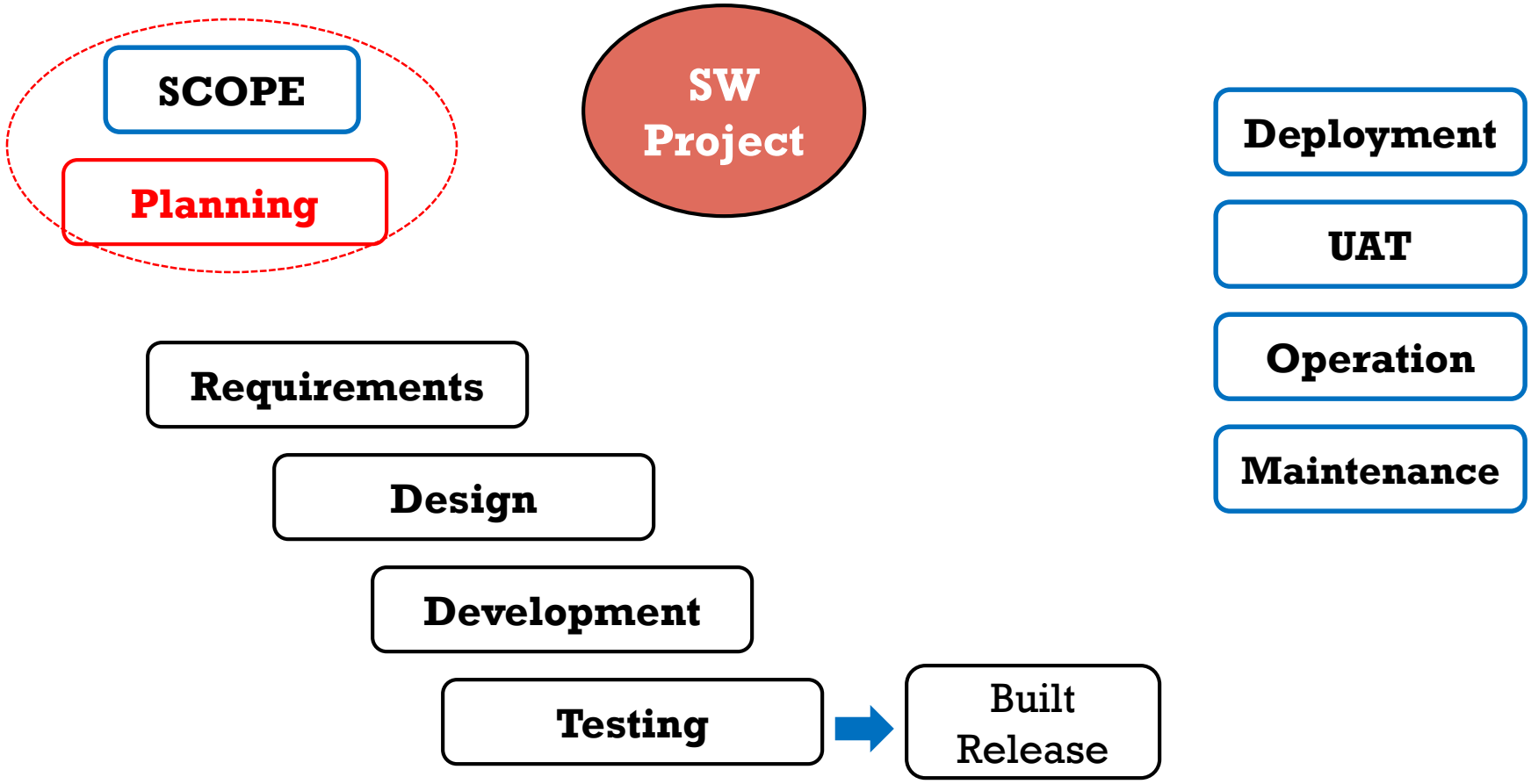
TODAY'S OUTLINE

- **Introduction(Project Planning)**
- **What is Work Breakdown Structure(WBS)?**
- **WBS Concepts**
- **WBS Goals**
- **When should we develop WBS?**
- **Why to develop WBS?**
- **How to Develop WBS**
- **WBS levels, pitfalls, guidelines, check list**


SCOPE
Planning
SW Project
Deployment
UAT
Operation
Maintenance
Requirements
Design
Development
Testing
Built Release

PROJECT MANAGEMENT

Planning, Estimating, Scheduling

- What's the difference?
- Plan: Identify activities. No specific start and end dates.
- Estimating: Determining the size & duration of activities.
- Schedule: Adds specific start and end dates, relationships, and resources.

WHY IS IT NEEDED?

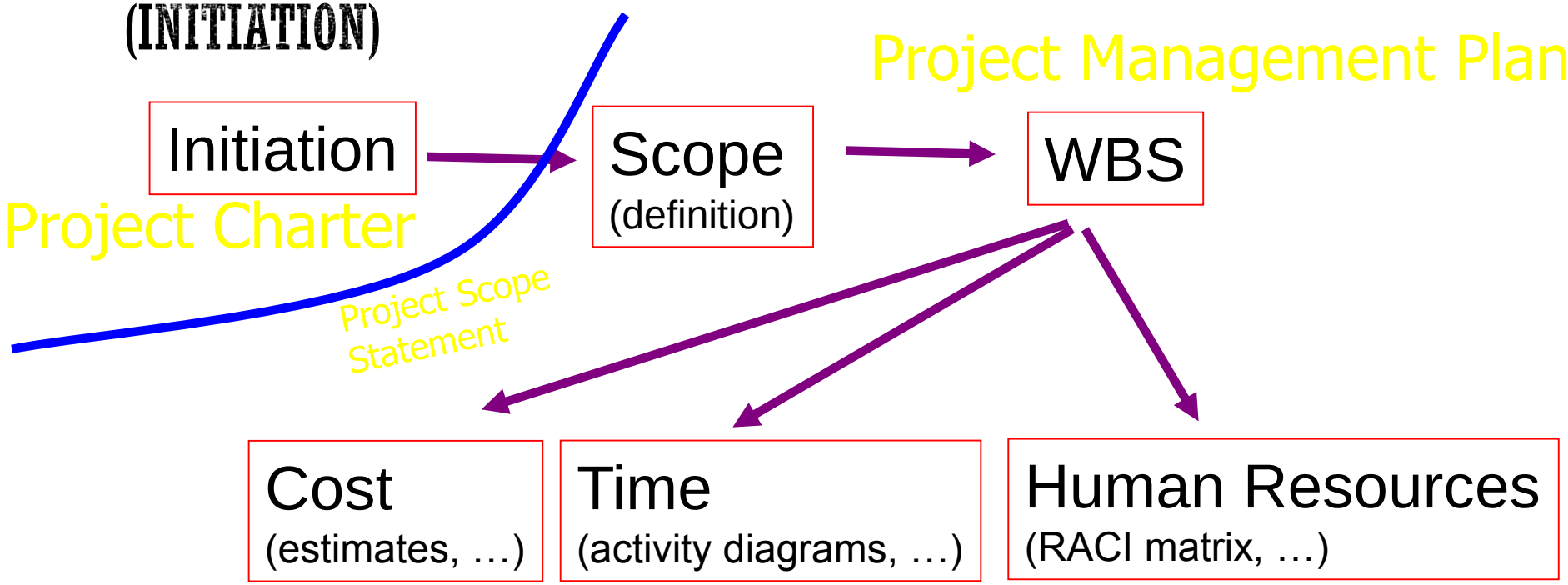
How To Schedule

1. Identify “what” needs to be done
   - Work Breakdown Structure (WBS)
2. Identify “how much” (the size)
   - Size estimation techniques
3. Identify the dependency between tasks
   - Dependency graph, network diagram
4. Estimate total duration of the work to be done
   - The actual schedule

WHY (CONT…)

- You need to decompose your project into manageable chunks
- ALL projects need this step
- Divide & Conquer
- Two main causes of project failure
  - Forgetting something critical
  - Ballpark estimates become targets

PROJECT MANAGEMENT PROCESSES (INITIATION)



- Also to consider: Quality, Risk, Communication, Procurement, Integration (PMBOK® knowledge areas)

INTRODUCTION

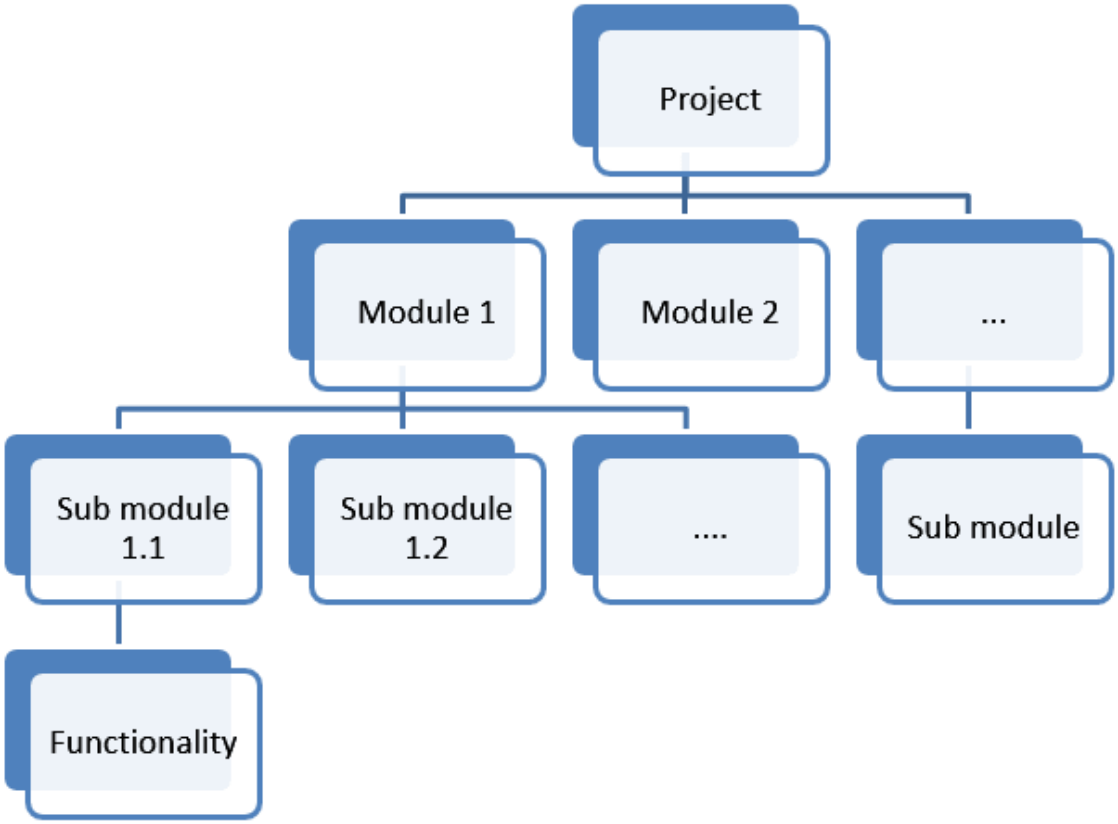
- **Dividing complex projects to simpler and manageable tasks is the process identified as Work Breakdown Structure (WBS).**

- **Usually, the project managers use this method for simplifying the project execution. In WBS, much larger tasks are broken-down to manageable chunks of work. These chunks can be easily supervised and estimated.**
- **<u>Work Package:</u> A group of related tasks that are defined at the same level within a work breakdown structure.**

WHAT IS WBS?

- **In project management and systems engineering, WBS is a deliverable oriented decomposition of a project into smaller components.**

- **A work breakdown structure element may be a product, data, a service, or any combination. A WBS also provides the necessary framework for detailed cost estimating and control along with providing guidance for schedule development and control**


Project
Module 1
Module 2
...
Sub module 1.1
Sub module 1.2
....
Sub module
Functionality

WHEN SHOULD WE DEVELOP WBS?

- **Once the project *Scope* is agreed (finalized) then before starting the project we need to *plan* various *components* (activities) of software development project.**

WBS GUIDELINES

- **Accurate and readable project organization.**
- **Accurate assignment of responsibilities to the project team.**
- **Indicates the project milestones and control points.**
- **Helps to estimate the cost, time, and risk.**
- **Illustrate the project scope, so the stakeholders can have a better understanding of the same.**

STEPS TO BUILD A WBS

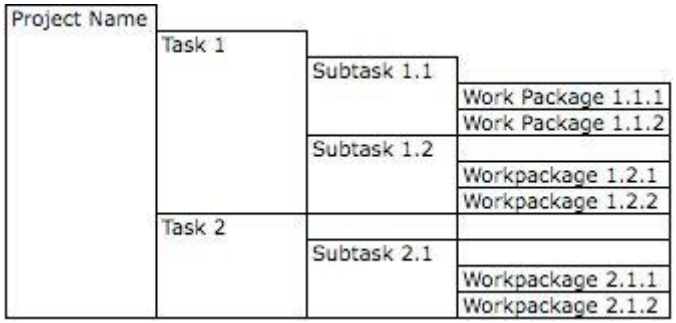
- **Begin with the Charter, focusing on Objectives and Deliverables**
- **Break the main product(s) down into sub-products**
- **Set the structure to match how you'll manage the project**
- **Lowest level not too detailed, not too large**
- **Is there a need for Integration?**
- **Identify support activities**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

WBS FORMATS

- 2 Formats
- Outline (Indented Format)
- Graphical Tree (Organizational Chart)

DISPLAYING THE WBS

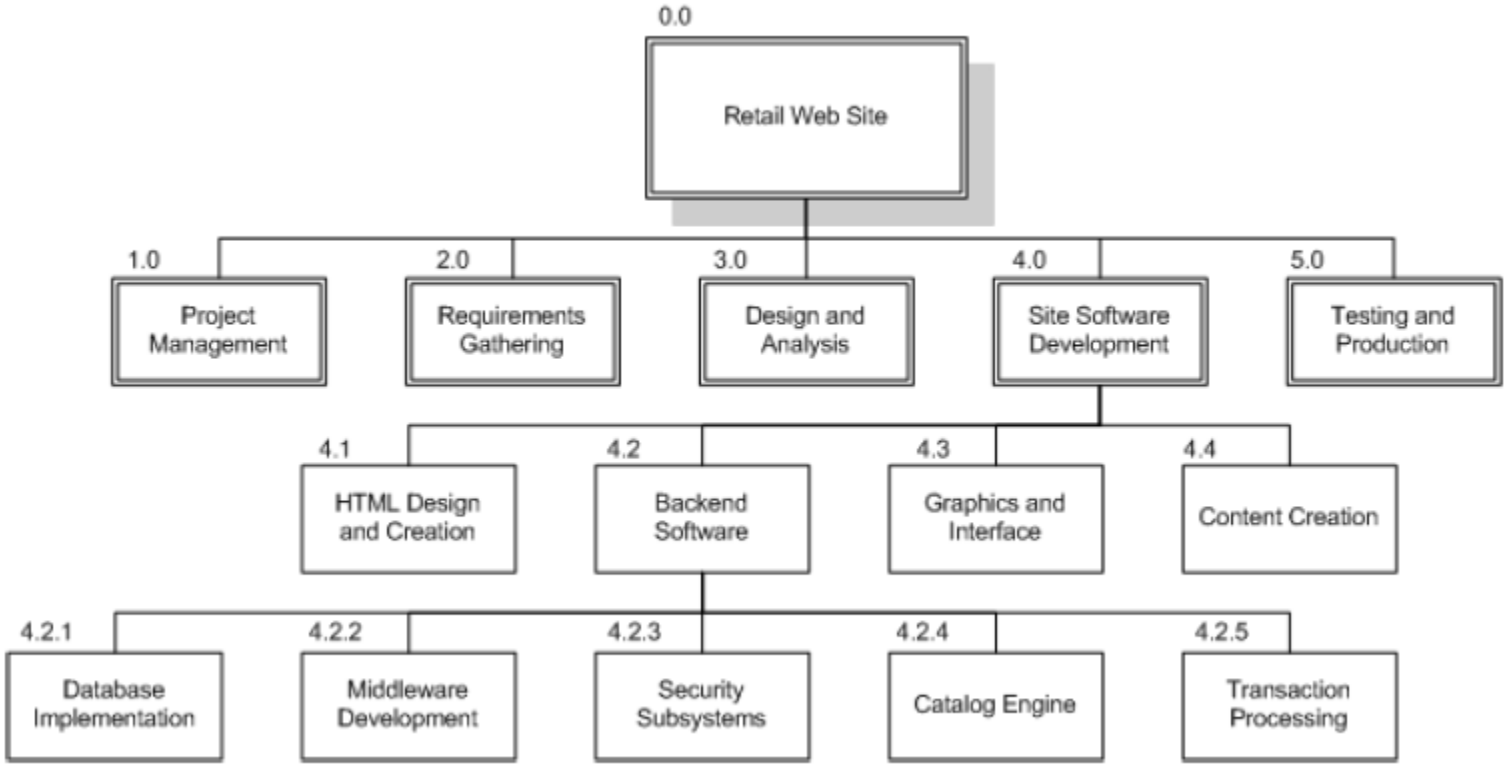
EXAMPLE OF OUTLINED WBS.



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.



PITFALLS

There are common pitfalls to creating a WBS. If you can keep these few possible, you and your team will be much more successful at creating a useful and accurate Work Breakdown Structure.

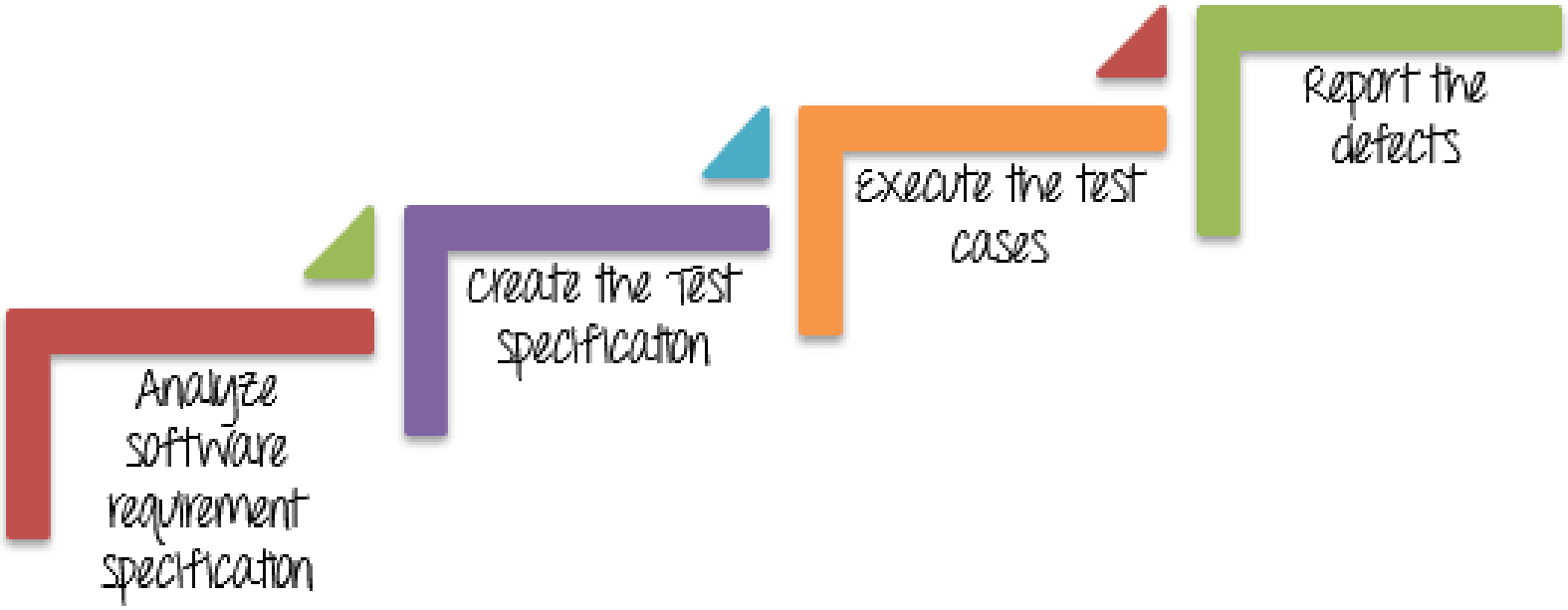
- **Level of Work Package Detail**
- **Deliverables Not Activities or Tasks**
- **WBS is not a Plan or Schedule**
- **WBS Updates Require Change Control**
- **WBS is not an Organizational Hierarchy**

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**

EXAMPLE: TEST AN ONLINE ORDERING SYSTEM

- Work Break Down structure test element is broken down into 4 smaller tasks-



We further break out each task to the subtask. The purpose of this activity is create task as detailed as possible.

Task	Sub task
Analyze software requirement specification	Investigate the soft requirement specs
	Interview with the developer & other stakeholders to know more about the website
Create the Test Specification	Design test scenarios
	Create test cases
	Review and revise test cases
Execute the test cases	Build up the test environment
	Execute the test cases
	Review test execution results
Report the defects	Create the Defect reports
	Report the defects

That is all