SOFTWARE ENGINEERING

Spring 2024

CASE STUDY: TASK MANAGEMENT APP DEVELOPMENT

- A software development firm, embarked on a project to create a task management app aimed at improving team collaboration and productivity. The project began with a thorough planning phase where project objectives, scope, and stakeholders were identified. Market research and user feedback informed the requirements gathering phase, where user personas were developed, and features were prioritized. The design phase focused on creating an intuitive user interface and establishing the app's branding. Technical development encompassed backend and frontend development and Testing Environment. Frontend development includes UI component Implementation, Backend Integration and responsiveness Optimization. Backend development includes server infrastructure setup, database development and user authentication. Testing Environment includes development environment configuration and testing tool implementation. Feature implementation involved building key functionalities such as task management, user collaboration tools, and reporting capabilities. Quality assurance was prioritized throughout the project, with rigorous testing conducted to ensure functionality, usability, and performance met expectations. Deployment planning included defining deployment strategies and preparing for the app's release to the production environment. Marketing and promotion efforts were coordinated to generate buzz and attract users upon launch. Post-launch activities focused on collecting user feedback, providing ongoing support, and iterating on the app based on user needs and market trends.

WORK BREAKDOWN STRUCTURE

How many tasks does the project have?

How much detail should the project plan have?

This query is overcome by Work breakdown structure (WBS)

This is the first major step in the planning phase of the project life cycle after the formulation of the project.

WORK BREAKDOWN STRUCTURE (CONT'D…)

- **Most modern day projects are designed, organized and built by teams of specialized professionals.**
- **To organize this process efficiently it is necessary to breakdown the project into specific parts that can be coordinated and controlled.**
- **The manner in which this project is structured is termed as the project's work break down structure (WBS).**
- **The first major step in the planning process after project requirements definition is the development of work breakdown structure (WBS).**

WORK BREAKDOWN STRUCTURE (CONT'D…)

- **Successful completion of project (or program) requires a plan that defines all its components, assigns responsibility to a specially identified organizational element, and establishes schedules and budgets for its accomplishment.**
- **WBS is a process by which the whole project is divided into various sub-projects, the sub-projects into various tasks, the tasks into various sub-tasks, and finally sub-tasks into work packages.**
- **The purpose of WBS is to identify terminal elements (the actual items to be done in a project); therefore WBS serves as the basis for much of project planning.**

WORK BREAKDOWN STRUCTURE (CONT'D…)

Usually, the project manager is responsible for structuring a project into several components. The level of the smaller components should be such that each of which should be:

- **Manageable so that specific authority, and responsibility can be assigned**
- **Independent so that there happens to be minimum interfacing with and dependence on other ongoing elements**
- **Integratable so that the total package can be seen, and**
- **Measurable in terms of progress**

WORK BREAKDOWN STRUCTURE (CONT'D…)

Level of WBS (Family Tree)

Level	Description
1.	Project
2.	Task
3.	Subtask
4.	Work package

WORK BREAKDOWN STRUCTURE (CONT'D…)

- **The upper two levels of the WBS are normally specified by the project management office (customer), while the lower levels are generated by the contractor for in-house control.**
- **Each level serves a vital purpose: level 1 is generally used for the authorization and release of all work, budgets are prepared at level 2, and schedules are prepared at level 3.**
- **The reason for this subdivision of effort is simply ease of control.**

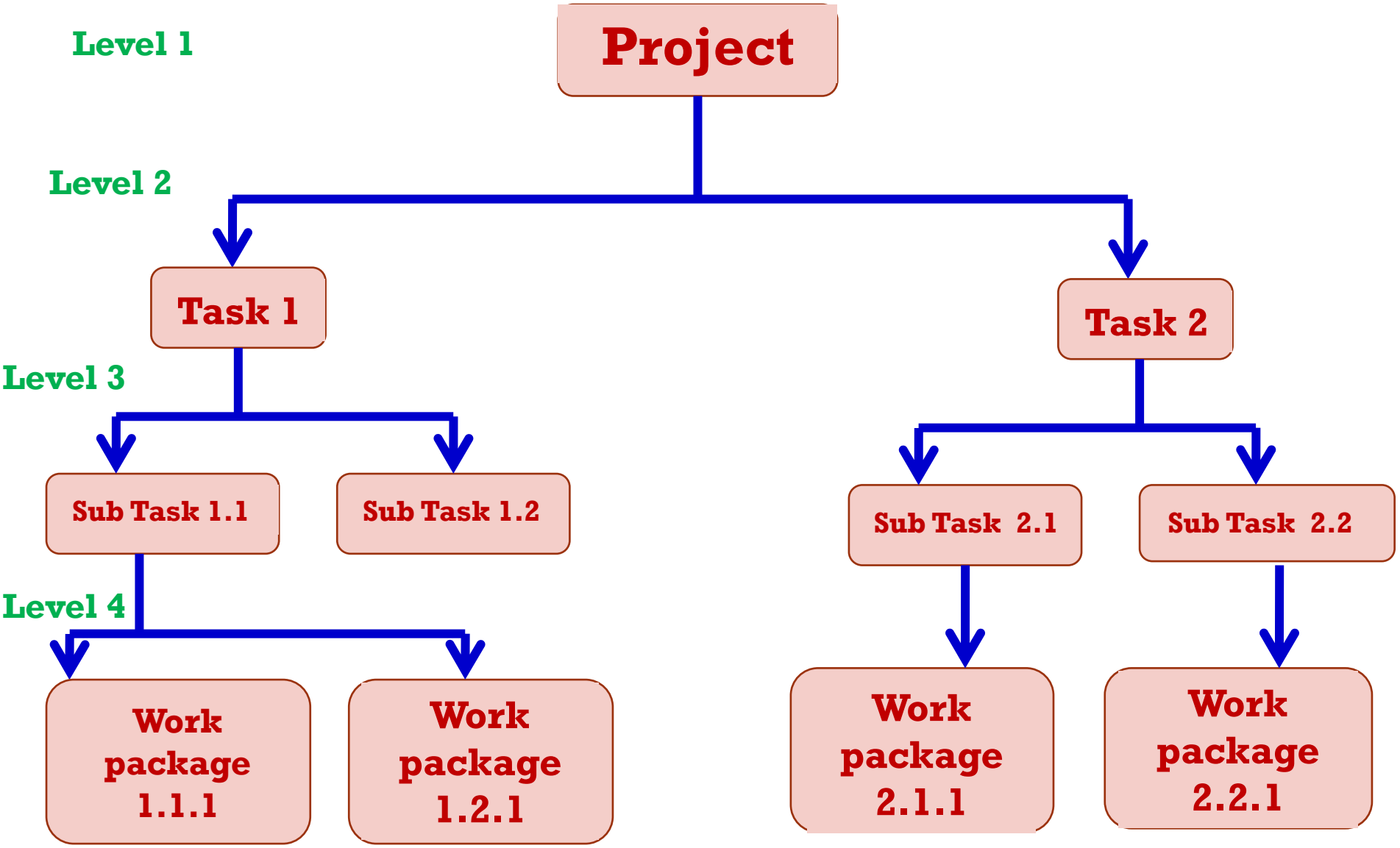


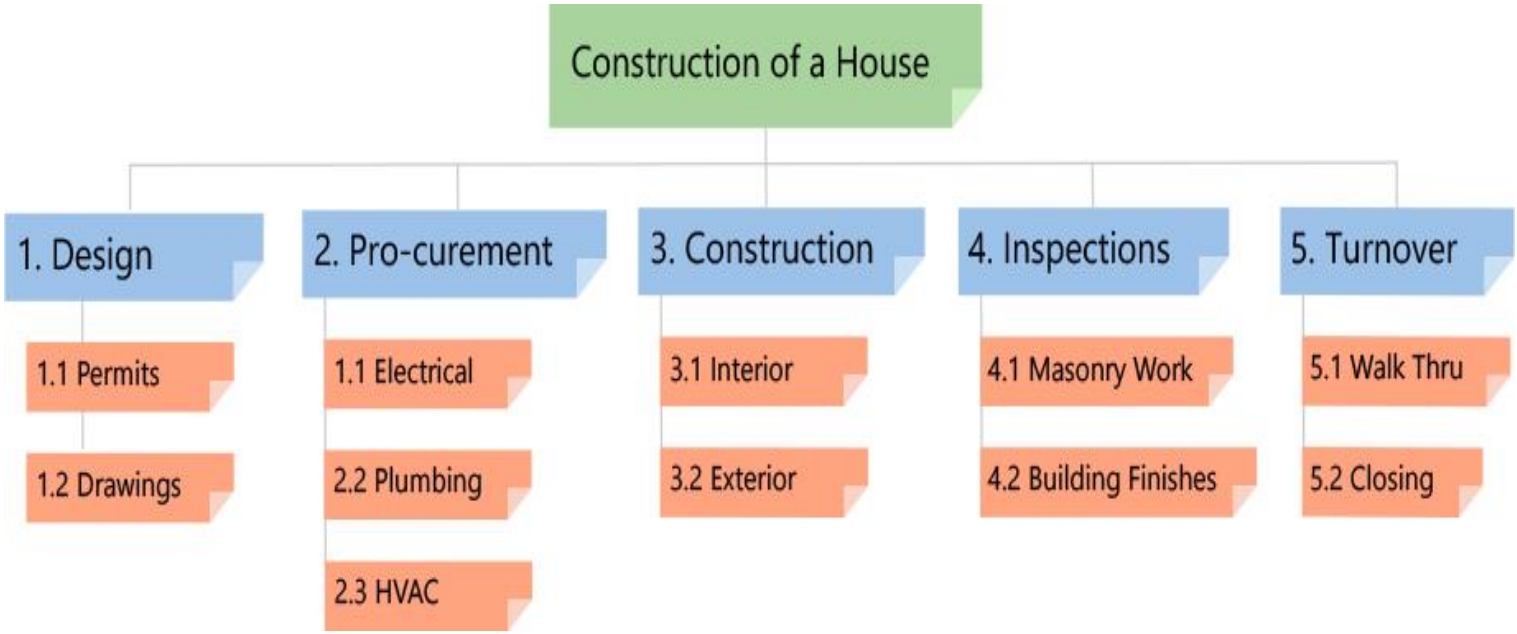
Fig: A typical WBS structure

WORK BREAKDOWN STRUCTURE (CONT'D…)

- **There is no hard and fast rule as to number of levels into which the project is to be breakdown.**
- **The number of stages/ levels should be neither too few nor too large. If the project is broken down into only one or two levels, integration of activities may become difficult.**
- **On the other hand if number of level are very high it will make analysis complex and unproductive.**
- **So WBS should be carried on till such time that the work package (small element) available is capable of giving a good definition of work content, the resource required and the cost and time requirement.**

TYPES OF WBS (CONT'D…)

Phase-Based Work Breakdown Structure



TYPES OF WBS (CONT'D…)

- **In Figure, a Phase-Based WBS, the Level 1 has five Elements.**
- **Each of these Elements are typical phases of a project.**
- **The Level 2 Elements are the unique deliverables in each phase.**
- **Regardless of the type of WBS, the lower Level Elements are all deliverables.**
- **A Phase-Based WBS requires work associated with multiple elements be divided into the work unique to each Level 1 Element.**

ROLE OF WBS

The WBS is the single most important element because it provides a common framework from which:

1. **The total program can be described as a summation of subdivided elements.**
2. **Costs and budgets can be established.**
3. **Time, cost and performance can be tracked.**
4. **Objectives can be linked to a company resources in a logical manner.**
5. **The responsibility assignment for each element can be established.**
6. **Network construction and control planning can be initiated.**

CRITERIA FOR DEVELOPING WBS

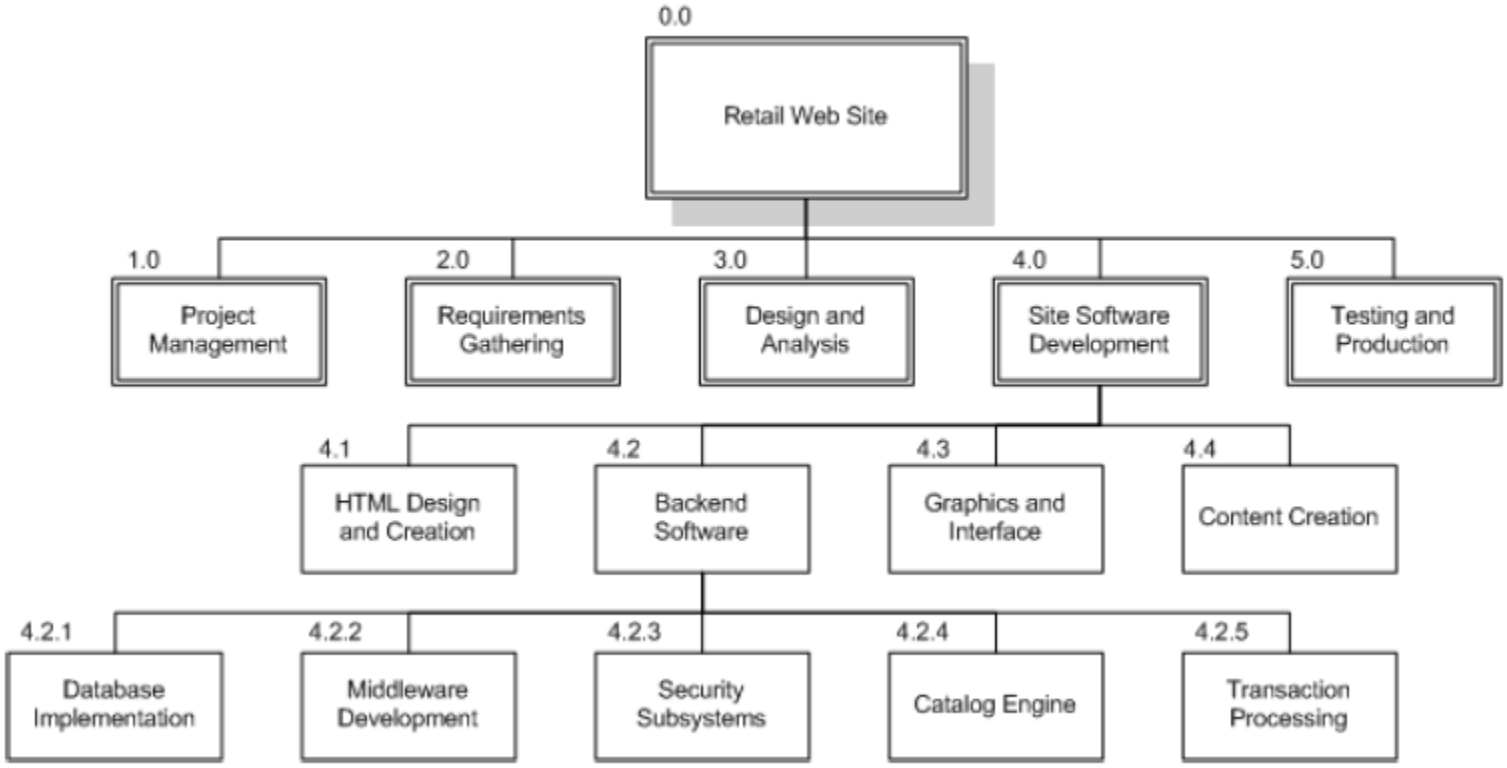
- **The WBS and work description should be easy to understand.**
- **All schedules should follow the WBS.**
- **No attempt should be made to subdivide work arbitrarily to the lower possible level.**
- **Since scope of effort can change during a program, every effort should be made to maintain flexibility in the WBS.**
- **The WBS can act as tangible milestones.**

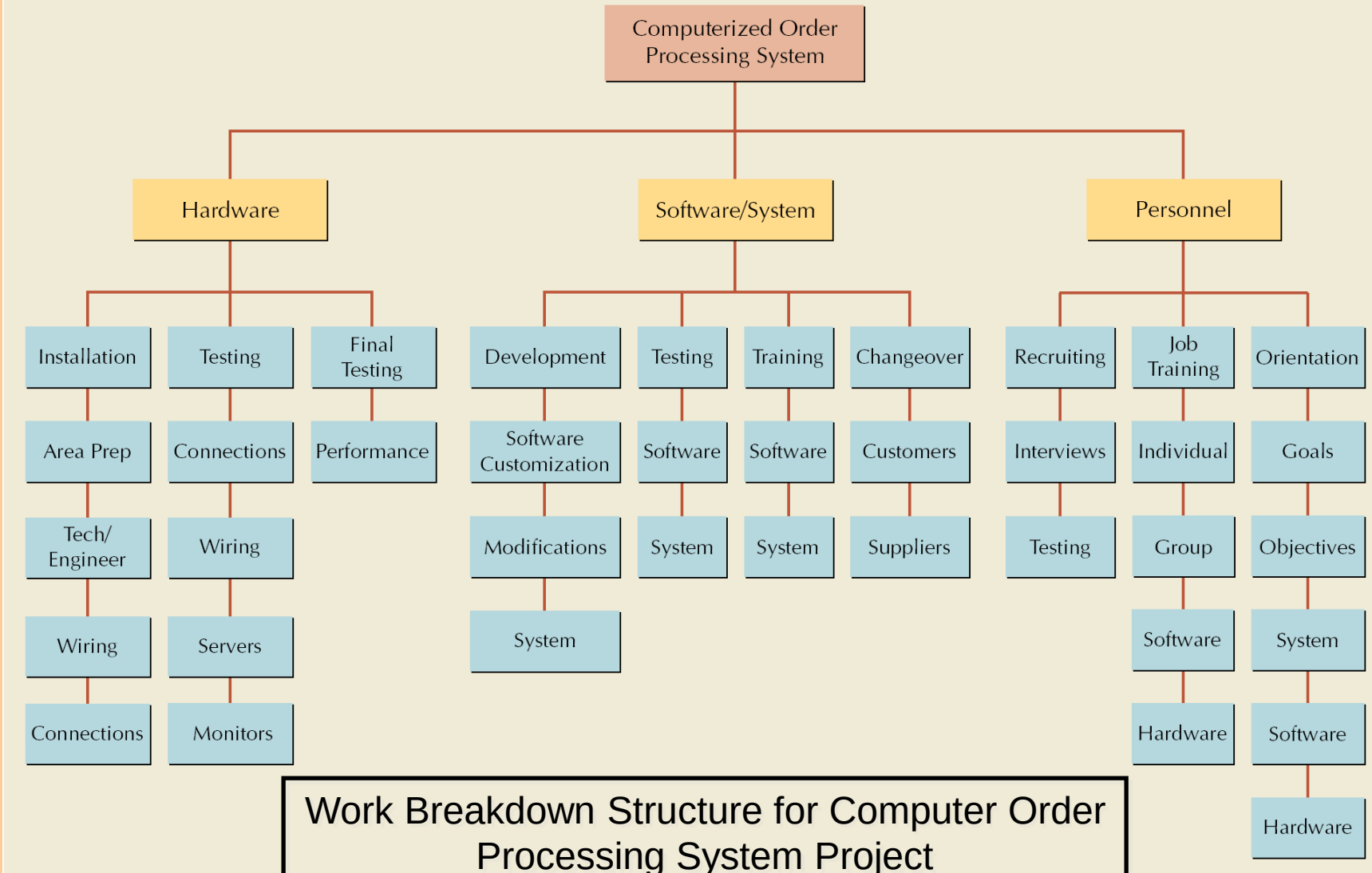
DISPLAYING THE WBS

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.





Work Breakdown Structure for Computer Order Processing System Project

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**