BHARATIYA VIDYA BHAVAN'S

SARDAR PATEL INSTITUTE OF TECHNOLOGY

MUNSHI NAGAR, ANDHERI(W), MUMBAI 400058

Academic Year- 2023-2024

Team Member Name:	**Team Member UID:**
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EXPERIMENT NO:	6
AIM:	To design Work Breakdown Structure and scheduling using Gantt Chart for Hostel Management System.

Problem Statement:	The Hostel Management System (HMS) project addresses the challenges faced in efficiently managing hostels in today's world. With a focus on enhancing student satisfaction, the HMS aims to provide a comprehensive solution. It offers user management for administrators, students and visitors, simplifies room booking, facilitates smooth check-in/check-out processes, manages billing and payments, monitors room availability, maintains student profiles, and provides reporting and analytics tools. The system ensures data security and privacy compliance while offering a user-friendly interface accessible via a web app. By automating administrative tasks and optimizing room management, the HMS benefits hostel owners, while also improving the student experience and modernizing hostel operations.

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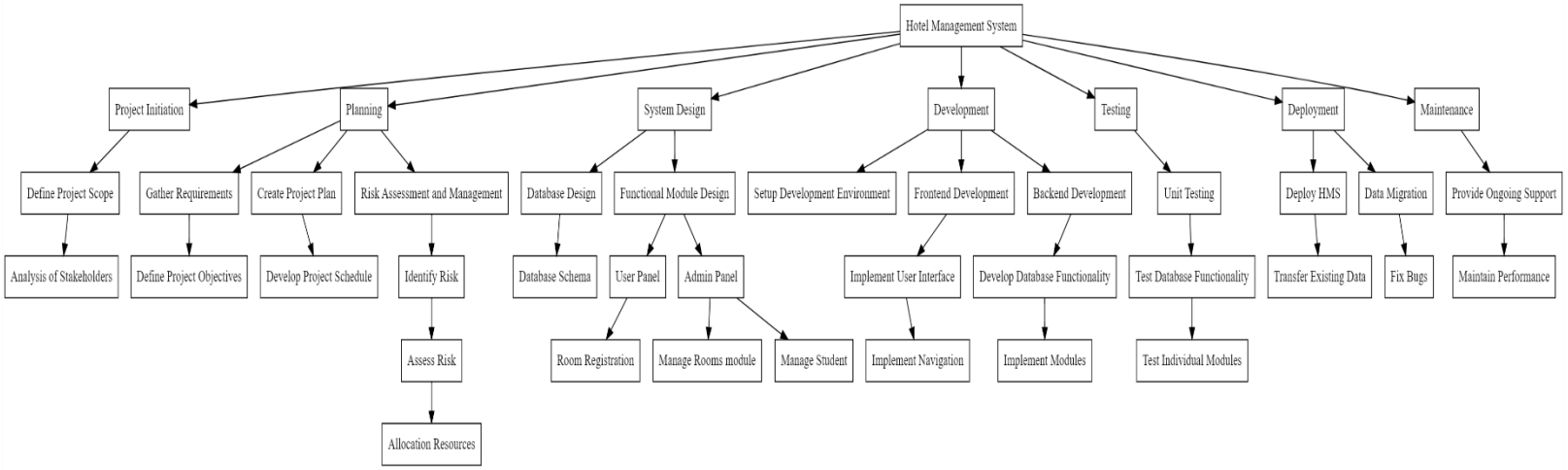
Workbreakdown Structure :-



1. Project Initiation

- **1.1 Define Project Scope**
  - Identify the project's goals and boundaries.
  - Determine the key deliverables of the project.
  - Outline constraints, assumptions, and dependencies.
- **1.2 Analysis of Stakeholders**
  - Identify all stakeholders (e.g., hotel management, IT team, end-users).
  - Analyze stakeholder needs and expectations.
  - Determine the level of influence and interest of each stakeholder.
  - Develop a communication plan for stakeholder engagement.

2. Planning

- **2.1 Gather Requirements**
  - 2.1.1 Define Project Objectives
    - Establish clear objectives for the project, aligning with stakeholder needs.
    - Define measurable success criteria and performance metrics.
- **2.2 Create Project Plan**
  - 2.2.1 Develop Project Schedule
    - Outline tasks, timelines, and milestones for each phase.
    - Assign resources to tasks and estimate time required.
    - Establish dependencies between tasks.

- **2.3 Risk Assessment and Management**
  - 2.3.1 Identify Risk
    - Identify potential risks (technical, operational, financial).
    - Document risks, their sources, and potential impacts on the project.
  - 2.3.2 Assess Risk
    - Evaluate the likelihood and impact of each risk.
    - Prioritize risks based on their potential effect on the project.
  - 2.3.3 Develop Risk Mitigation Strategies
    - Identify risk response strategies (avoidance, mitigation, transfer, or acceptance).
    - Define action plans for high-priority risks.
  - 2.3.4 Allocation of Resources
    - Determine required resources (people, tools, equipment).
    - Allocate resources based on project schedule and priorities.

3. System Design

- **3.1 Database Design**
  - 3.1.1 Define Database Schema
    - Define tables, columns, and data types for each entity.
    - Establish indexing strategies and data constraints.
- **3.2 UI Design**
  - Design the layout, color scheme, and branding of the user interface.
  - Ensure that the UI is user-friendly and accessible for all types of users.
- **3.3 Functional Module Design**
  - 3.3.1 Student Management Module
    - Design the module to manage student profiles, check-ins, and check-outs.
    - Define functionality for tracking room allocations and status.
  - 3.3.2 Room Allocation Module
    - Develop functionality to assign rooms based on availability and requirements.
    - Implement rules for room changes and adjustments.

4. Development

- **4.1 Setup Development Environment**
  - Set up the development tools and frameworks.
  - Configure version control and development environments.
- **4.2 Frontend Development**
  - 4.2.1 Implement User Interface
    - Build the user interface based on the UI design specifications.
    - Test and refine UI components for responsiveness and usability.
  - 4.2.2 Implement Navigation
    - Implement a consistent and intuitive navigation structure.
    - Ensure all key functions are easily accessible to users.

- **4.3 Backend Development**
  - 4.3.1 Develop Database Functionality
    - Ensure data validation, integrity, and security in database operations.
  - 4.3.2 Implement Modules

- Develop backend functionality for each module (Student Management, Room Allocation).
- Test and debug module functions to ensure reliability and performance.

5. Testing

- **5.1 Unit Testing**
  - 5.1.1 Test Database Functionality
    - Verify that database operations (e.g., queries, inserts, updates) work as intended.
    - Ensure data consistency and integrity.
  - 5.1.2 Test Individual Modules
    - Test each module (Student Management, Room Allocation) in isolation.
    - Verify functionality, performance, and adherence to specifications.
- **5.2 User Acceptance Testing**
  - 5.2.1 Involve End Users
    - Engage end users to test the system from a user perspective.
    - Collect feedback on usability, functionality, and any issues encountered.
  - 5.2.2 Address User Feedback
    - Document user feedback and identify necessary changes.
    - Implement changes based on priority and feasibility.

6. Deployment

- **6.1 Deploy HMS**
  - 6.1.1 Transfer Existing Data
    - Migrate data from previous systems or spreadsheets into the new system.
    - Verify data accuracy and integrity post-migration.
- **6.2 Data Migration**
  - 6.2.1 Fix Bugs
    - Conduct final debugging and troubleshooting based on initial deployment testing.
    - Resolve any issues that arise to ensure smooth system functionality.

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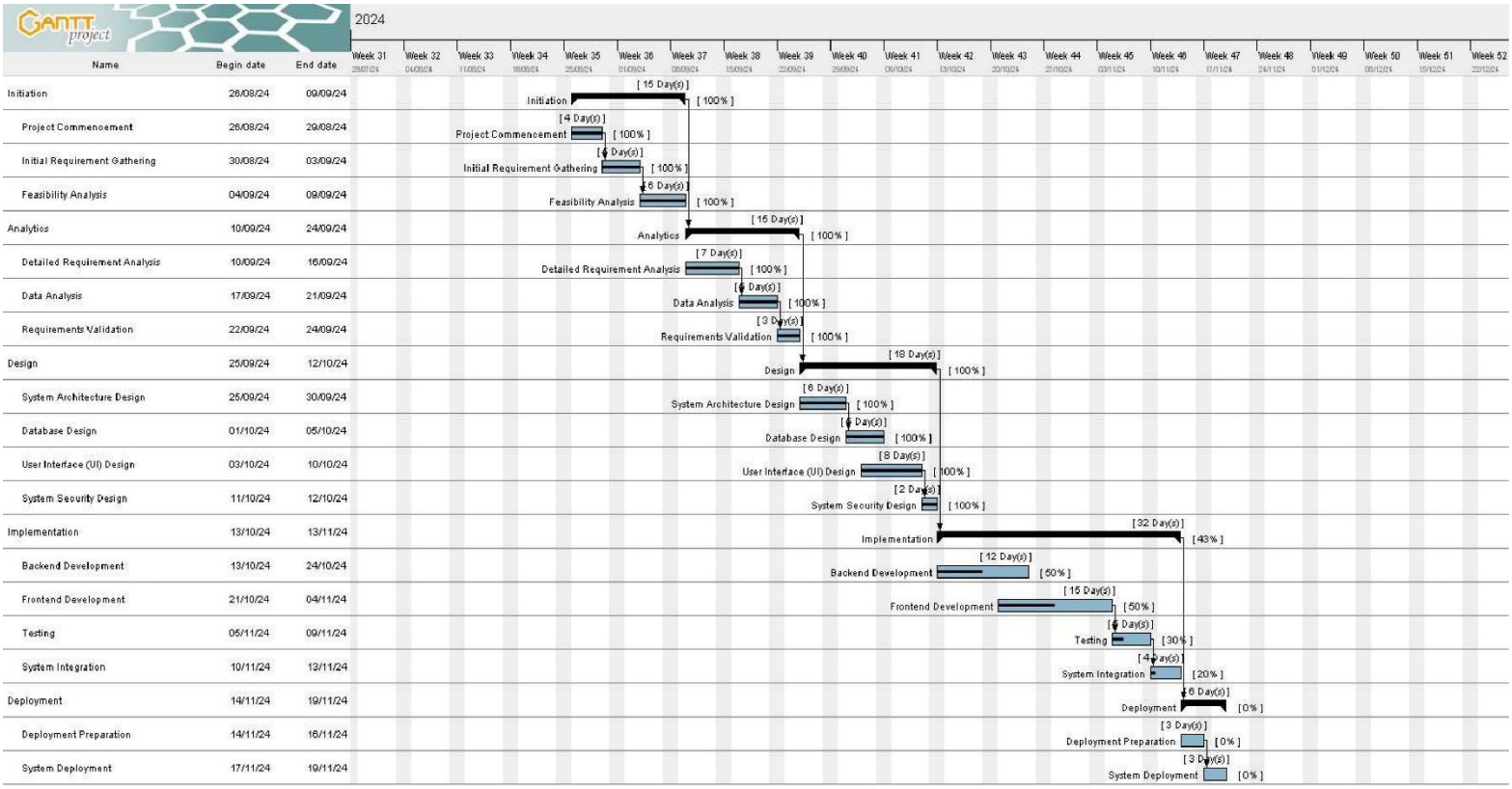
Gantt Chart :-



Name	Begin date	End date
Initiation	26/08/24	09/09/24
Project Commencement	26/08/24	29/08/24
Initial Requirement Gathering	30/08/24	03/09/24
Feasibility Analysis	04/09/24	09/09/24
Analytics	10/09/24	24/09/24
Detailed Requirement Analysis	10/09/24	16/09/24
Data Analysis	17/09/24	21/09/24
Requirements Validation	22/09/24	24/09/24
Design	25/09/24	12/10/24
System Architecture Design	25/09/24	30/09/24
Database Design	01/10/24	05/10/24
User Interface (UI) Design	03/10/24	10/10/24
System Security Design	11/10/24	12/10/24
Implementation	13/10/24	13/11/24
Backend Development	13/10/24	24/10/24
Frontend Development	21/10/24	04/11/24
Testing	05/11/24	09/11/24
System Integration	10/11/24	13/11/24
Deployment	14/11/24	19/11/24
Deployment Preparation	14/11/24	16/11/24
System Deployment	17/11/24	19/11/24

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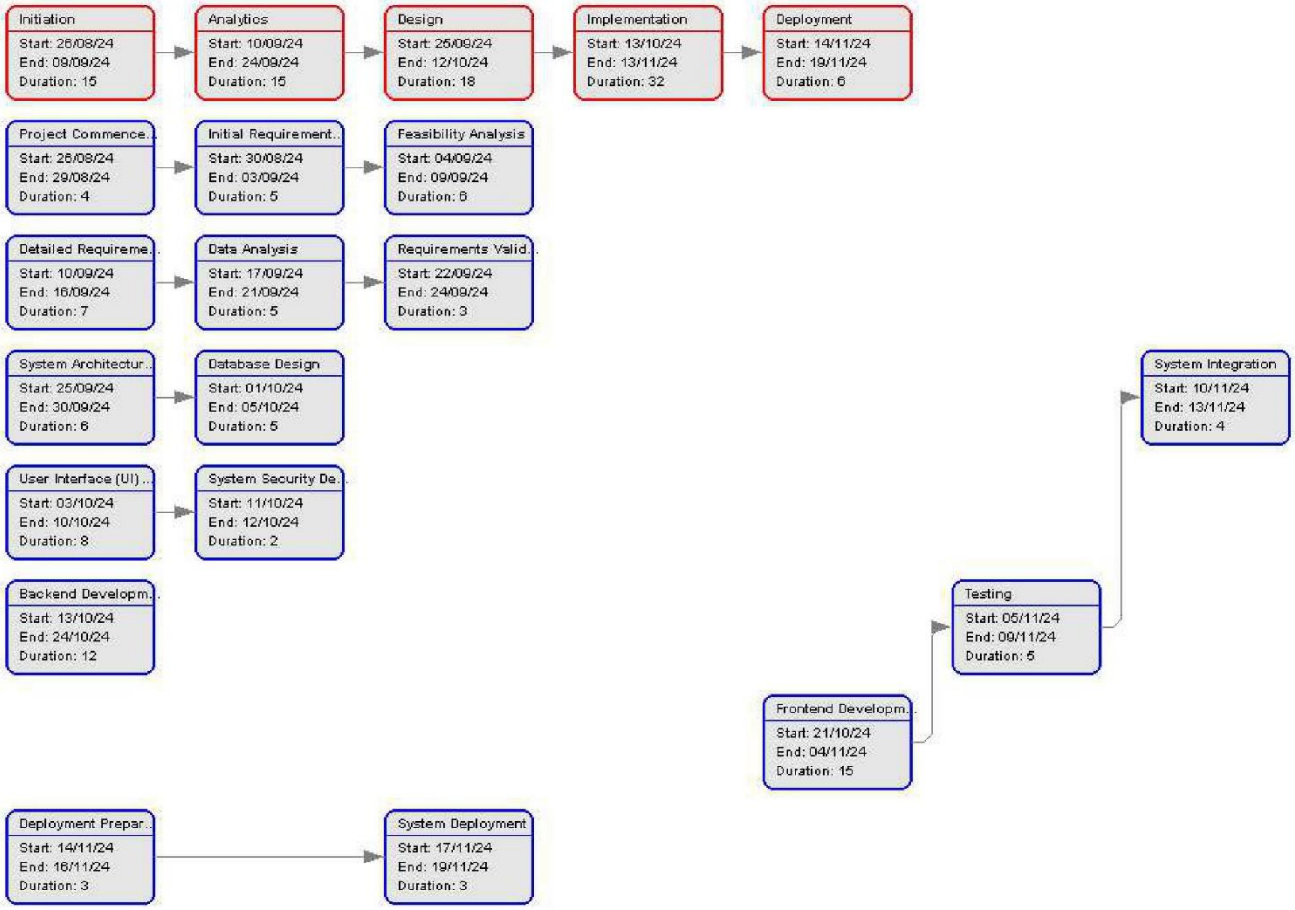
PERT CHART:



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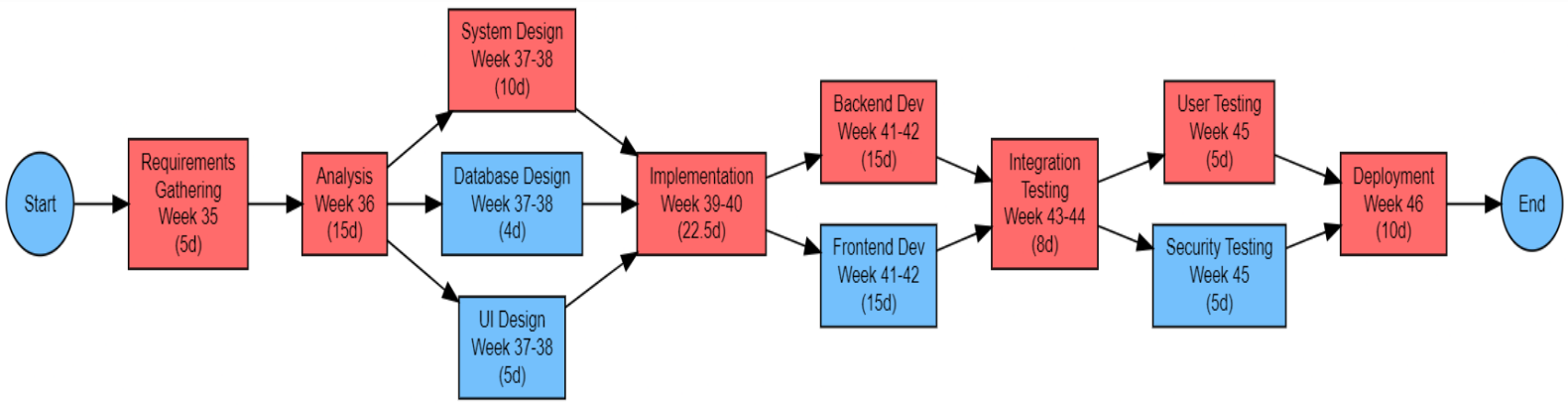
Critical path:



Function Point (FP) and Lines of Code (LOC) Estimation Methodology

External Inputs (EI) (Average Complexity)
Complexity weight = 5

1. User Registration(Student)
2. Add/remove room
3. Add/remove course
4. Login Information
5. Book Hostel

External Outputs (EO) (Low Complexity)
Complexity weight = 3

1. View Available Commodities
2. Display Hostel room Booking Confirmation
3. Error Messages (e.g., invalid login or order error)

External Inquiries (EQ) (Low Complexity)
Complexity weight = 3

1. Validate User Credentials
2. Generate own booking information
3. Retrieve room information

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Internal Logical Files (ILF) (Low Complexity)

Complexity weight = 5

1. Rooms data
2. Room registration data
3. Admin/User credentials
4. Adress data
5. Courses information

External Interface Files (EIF) (Low Complexity)

Complexity weight = 1

1. Bootstrap

Calculation Unadjusted FP

(UFP):

UFP = (5×3)+(4×3)+(3×3)+(5×7)+(1×5) = 76

GSCs Calculation:

Weights based on system requirements:

- Data communications: 3 (Medium)
- Distributed data processing: 2 (Low)
- Performance: 4 (High)
- Heavily used configuration: 3 (Medium)
- Transaction rate: 4 (High)
- Online data entry: 2 (Low)
- End-user efficiency: 3 (Medium)
- Complex processing: 5 (Very high)
- Installation ease: 2 (Low)
- Operational ease: 3 (Medium)
- Multiple sites: 1 (Low)
- Facilitates change: 3 (Medium)
- Unusual processing: 2 (Low)
- Extensive data: 4 (High)

Function Points (FP):

FP = UFP X (0.65 + 0.01 X Sum of GSCs)
= 76 X (0.65 + 0.01 X 41)
= 81.56

LOC Estimate: Using 50 LOC per FP LOC =

80.56 × 50 = 4028

Three-Point Estimation of LOC

- **Optimistic (40 LOC/FP):**
  LOC=40×80.56=3222
- **Most Likely (50 LOC/FP):**
  LOC=50×80.56=4028
- **Pessimistic (60 LOC/FP):**

LOC=60×80.56=4834

Average LOC Estimate = 4028

Results

- **Adjusted FP:** 80.56
- **Estimated LOC:** 4028
- **Estimated LOC Range:** 3222 to 4834 LOC

Conclusion :-

In conclusion, the development of a Work Breakdown Structure (WBS) and the use of a Gantt Chart for a Hostel Management System project are essential tools for effective project planning and management. The WBS helps break down the project into manageable tasks, while the Gantt Chart provides a visual timeline for task scheduling. This approach ensures better organization, resource allocation, and timely completion of the project, ultimately leading to a more efficient and successful Hostel Management System implementation.