SOFT2101 – Principles of Software Engineering

Homework #4 – Project Planning and Git Assignment

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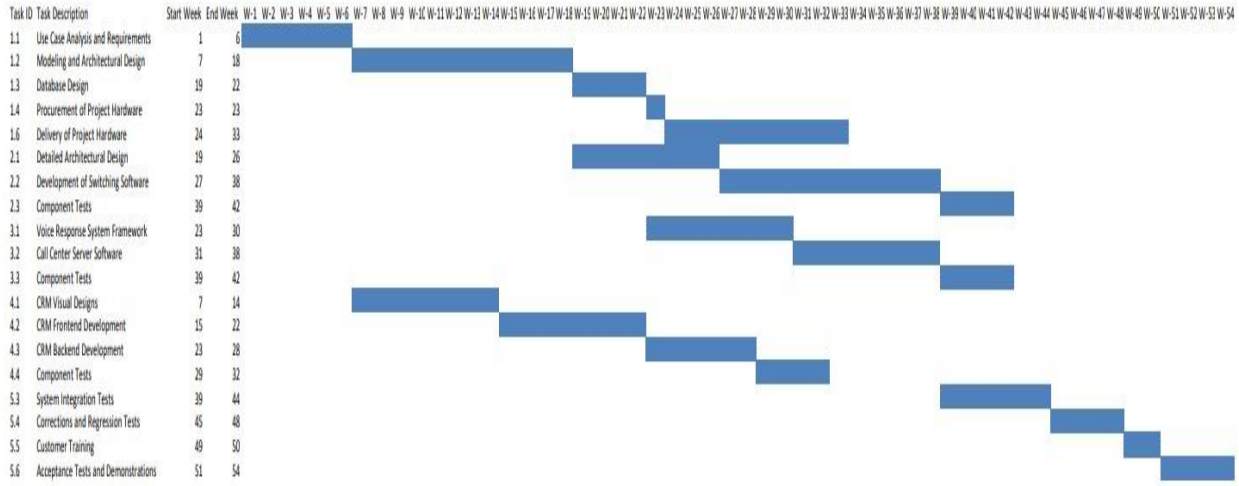
1. Gantt Chart

A Gantt Chart was prepared based on the given Work Breakdown Structure (WBS). Task start times and durations were calculated according to their dependencies. Parallel and sequential activities of the project are clearly illustrated. Estimation inconsistencies were ignored as instructed.
Total Project Duration: approximately 92 weeks.

Gantt Chart – Task Table



Task ID	Task Description	Start Week	End Week
1.1	Use Case Analysis and Requirements	1	6
1.2	Modeling and Architectural Design	7	18
1.3	Database Design	19	22
1.4	Procurement of Project Hardware	23	23
1.6	Delivery of Project Hardware	24	33
2.1	Detailed Architectural Design	19	26
2.2	Development of Switching Software	27	38
2.3	Component Tests	39	42
3.1	Voice Response System Framework	23	30
3.2	Call Center Server Software	31	38
3.3	Component Tests	39	42
4.1	CRM Visual Designs	7	14
4.2	CRM Frontend Development	15	22
4.3	CRM Backend Development	23	28
4.4	Component Tests	29	32
5.3	System Integration Tests	39	44
5.4	Corrections and Regression Tests	45	48
5.5	Customer Training	49	50
5.6	Acceptance Tests and Demonstrations	51	54

2. Activity Network Diagram

The activity network diagram represents task dependencies and execution order. Multiple parallel paths exist and converge during system integration.

Identified logical paths:

- 1.1 → 1.2 → 1.3 → 1.4 → 1.6
- 1.2 → 2.1 → 2.2 → 2.3
- 1.3 → 3.1 → 3.2 → 3.3
- 1.1 → 4.1 → 4.2
- 1.3 → 4.3 → 4.4
- (1.6 + 3.2 + 4.4) → 5.3 → 5.4 → 5.5 → 5.6

3. Critical Path Analysis

After evaluating all possible paths in the activity network, the **critical path** was identified as:

Critical Path:
1.1 → 1.2 → 1.3 → 1.4 → 1.6 → 5.3 → 5.4 → 5.5 → 5.6

These activities have zero slack time; therefore, any delay in them directly increases the total project duration.

4. Minimum Required Team Size

Assuming:

- Each task is non-preemptive
- Each task is performed by a single person
- Team members are fully multi-functional

The **minimum number of people required** to complete the project in the shortest possible time is:

➡️ **5 people**

This allows maximum parallel execution of independent tasks.

5. Risk Scenario and Contingency Plan

If **Task 1.6 (Delivery of Project Hardware)** takes **40 weeks instead of 10 weeks**, the overall project duration increases by approximately **30 weeks**, since this task lies on the critical path.

Contingency and mitigation strategies:

- Schedule buffers on critical activities
- Parallel preparation of testing activities
- Use of alternative suppliers
- Supplier redundancy and outsourcing options

6. Git and GitHub Assignment Summary

Git was configured with user information, and a public GitHub repository was created. Multiple branches were used to implement and modify a Java program according to incremental requirements. All changes were committed with appropriate messages and merged into the main branch following the assignment instructions.

GitHub Repository

https://github.com/AtahanBayat/soft2101-hw4