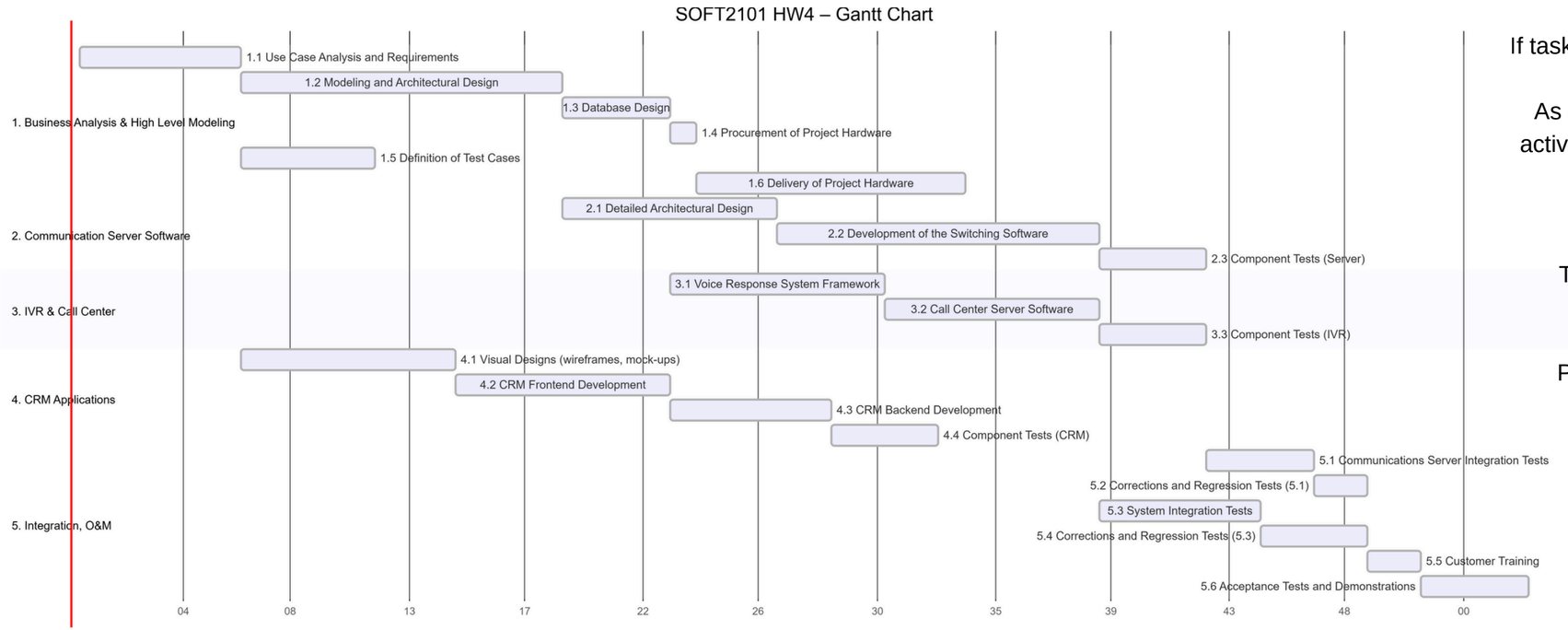
Task ID	Task Name	Duration (weeks)	Predecessor	Start Week	End Week
1.1	Use Case Analysis and Requirements	6	-	1	6
1.2	Modeling and Architectural Design	12	1.1	7	18
1.3	Database Design	4	1.2	19	22
1.4	Procurement of Project Hardware	1	1.3	23	23
1.5	Definition of Test Cases	5	1.1	7	11
1.6	Delivery of Project Hardware	10	1.4	24	33
2.1	Detailed Architectural Design	8	1.2	19	26
2.2	Development of the Switching Software	12	2.1	27	38
2.3	Component Tests (Server)	4	2.2	39	42
3.1	Voice Response System Framework	8	1.3	23	30
3.2	Call Center Server Software	8	3.1	31	38
3.3	Component Tests (IVR)	4	3.2	39	42
4.1	Visual Designs (wireframes, mock-ups)	8	1.1	7	14
4.2	CRM Frontend Development	8	4.1	15	22
4.3	CRM Backend Development	6	1.3	23	28
4.4	Component Test (CRM)	4	4.3	29	32
5.1	Communications Server Integration Tests	4	1.6,2.3	43	46
5.2	Corrections and Regression Test	2	5.1	47	48
5.3	System Integration Tests	6	1.6,3.2,4.4	39	44
5.4	Corrections and Regression Test	4	5.3	45	48
5.5	Customer Training	2	5.4	49	50
5.6	Acceptance Tests and Demonstrations	4	5.5	51	54



Project Duration

Based on the Gantt chart created using the given Work Breakdown Structure, the total duration of the project is approximately 58 weeks.
The project starts at Week 0 and ends with the completion of acceptance tests and demonstrations.

Critical Path

The critical path of the project consists of the following activities:
1.1 → 1.2 → 1.3 → 1.4 → 1.6 → 5.3 → 5.4 → 5.5 → 5.6
Any delay in these activities will directly increase the overall project duration, as they have zero slack time.

Resource Requirement Estimation

Assuming that:
Each task is performed by only one person, and
Team members are multi-functional,
The maximum number of parallel tasks occurring at the same time is approximately 6.
Therefore, a team of at least 6 people is required to complete the project in the minimum possible time.

Impact of Unexpected Delay (Task 1.6)

If task 1.6 – Delivery of Project Hardware takes 40 weeks instead of 10 weeks, this task becomes a major bottleneck in the project schedule.
As task 1.6 lies on the critical path and is a prerequisite for multiple integration activities, the overall project duration would increase by approximately 30 weeks, extending the total duration to nearly 88 weeks.

Contingency Plan

To mitigate the negative effects of such a delay, the following contingency measures can be proposed:
Using alternative hardware suppliers,
Performing early integration tests using simulated or temporary hardware,
Introducing schedule buffers for high-risk procurement tasks,
Closely monitoring supplier performance and delivery milestones.

GitHub Repository Link:

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