SE4002 – Fundamentals of Software Project Management

(Project Deliverable #2)

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Chapter 1

Project Scope Statement and Agent Description

1.1 Project Title

Cross-Sell Suggestion Agent (CSSA)

1.2 Project Justification

In modern e-commerce and digital banking, customers often miss complementary options, leading to lost revenue and engagement. The Cross-Sell Suggestion Agent uses predictive analytics and machine learning to recommend personalized products, boosting sales and retention.

1.3 Product Characteristics

- AI-driven recommendation engine (collaborative/content-based filtering).
- API integration with CRM/e-commerce platforms.
- Real-time user data analysis.
- Adaptive learning from interactions.
- Admin dashboard for metrics.
- Secure, anonymized data handling.

1.4 Project Deliverables

1. Functional Cross-Sell Agent with backend integration.
2. UI for recommendations.
3. Model Training and Testing Report.

4. Deployment Documentation.
5. System Evaluation Report.
6. Final Presentation and Handover.

1.5 Assumptions

- Access to customer data (transactions, demographics).
- Available APIs for integration.
- Team expertise in AI and data preprocessing.
- Stakeholder availability for feedback.

1.6 Constraints

- 12-week completion timeline.
- Open-source tech (Python, TensorFlow, Flask).
- Strict data privacy compliance.
- Limited computational resources.

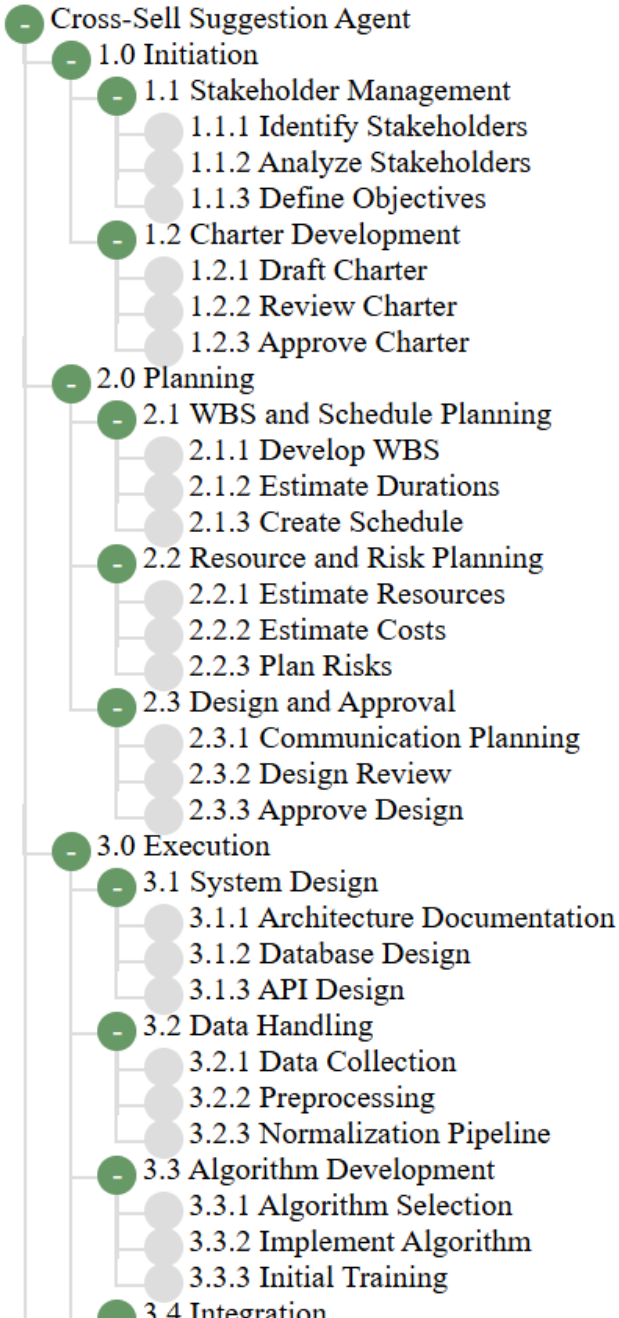
1.7 Agent Description

The Cross-Sell Suggestion Agent (CSSA) is an AI module that recommends complementary products based on purchase patterns. It collaborates with a Supervisor Agent to manage sub-agents for data preprocessing, recommendations, and tracking, improving accuracy over time.

Chapter 2

Work Breakdown Structure (WBS)

2.1 Hierarchical (Graphical) Representation



2.2 Tabular Format

WBS Code	Task Name	Description	Deliverables
1.0	Initiation	Define project foundation.	Approved project charter.
1.1	Stakeholder Management	Manage stakeholders and charter.	Stakeholder register, signed charter.
1.1.1	Identify Stakeholders	List involved parties.	Stakeholder list.
1.1.2	Analyze Stakeholders	Assess influence and needs.	Stakeholder analysis report.
1.1.3	Define Objectives	Set project goals.	Objectives document.
1.2	Charter Development	Develop and approve charter.	Signed charter.
1.2.1	Draft Charter	Create initial draft.	Charter draft.
1.2.2	Review Charter	Team review.	Reviewed charter.
1.2.3	Approve Charter	Formal approval.	Signed charter.
2.0	Planning	Plan execution and monitoring.	Project plan, schedule.
2.1	WBS and Schedule Planning	Develop WBS and schedule.	WBS document, Gantt chart.
2.1.1	Develop WBS	Break down tasks.	WBS draft.
2.1.2	Estimate Durations	Estimate task times.	Duration estimates.
2.1.3	Create Schedule	Develop Gantt chart.	Project schedule.
2.2	Resource and Risk Planning	Allocate resources, plan risks.	Resource sheet, risk plan.
2.2.1	Estimate Resources	Identify resources.	Resource list.
2.2.2	Estimate Costs	Calculate budget.	Cost sheet.
2.2.3	Plan Risks	Identify risks.	Risk register.
2.3	Design and Approval	Validate design.	Approved design document.
2.3.1	Communication Planning	Plan communication.	Communication plan.
2.3.2	Design Review	Stakeholder review.	Design feedback.
2.3.3	Approve Design	Final design approval.	Approved design.
3.0	Execution	Develop and integrate agent.	Functional prototype.

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WBS Code	Task Name	Description	Deliverables
3.1	System Design	Build structure.	System architecture diagrams.
3.1.1	Architecture Documentation	Document architecture.	Architecture document.
3.1.2	Database Design	Design schema.	Database schema.
3.1.3	API Design	Design APIs.	API specifications.
3.2	Data Handling	Gather and clean data.	Preprocessed dataset.
3.2.1	Data Collection	Collect data.	Raw dataset.
3.2.2	Preprocessing	Clean and normalize data.	Processed dataset.
3.2.3	Normalization Pipeline	Develop pipeline.	Pipeline code.
3.3	Algorithm Development	Design recommendation model.	Trained AI model.
3.3.1	Algorithm Selection	Select algorithms.	Algorithm blueprint.
3.3.2	Implement Algorithm	Code algorithm.	Algorithm code.
3.3.3	Initial Training	Initial model training.	Initial model.
3.4	Integration	Connect with platforms.	Integrated module.
3.4.1	Platform Connection	Connect to CRM/e-commerce.	Integration code.
3.4.2	API Implementation	Implement APIs.	API endpoints.
3.4.3	Test Integration	Test connections.	Integration test report.
3.5	Model Testing	Train and test model.	Training report.
3.5.1	Full Training	Train on dataset.	Trained model.
3.5.2	Baseline Testing	Evaluate accuracy.	Test results.
3.5.3	Optimization	Optimize performance.	Optimized model.
3.6	Prototype	Deploy prototype.	Working prototype.
3.6.1	Assemble Prototype	Integrate components.	Prototype build.
3.6.2	Initial Deployment	Deploy to test env.	Deployed prototype.
3.6.3	Stakeholder Review	Review with stakeholders.	Review feedback.

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WBS Code	Task Name	Description	Deliverables
4.0	Monitoring & Controlling	Ensure quality and control.	Progress reports, QA results.
4.1	Testing Management	Verify outputs.	Validation report.
4.1.1	Perform Testing	Run unit/integration tests.	Test cases.
4.1.2	Validate Model	Validate accuracy.	Validation results.
4.1.3	Document Issues	Log and fix issues.	Issue log.
4.2	Progress Management	Track milestones.	Updated status reports.
4.2.1	Track Milestones	Monitor milestones.	Milestone reports.
4.2.2	Update Schedules	Adjust schedules.	Updated schedule.
4.2.3	Status Reporting	Generate reports.	Status documents.
4.3	Risk Management	Review risks.	Risk log updates.
4.3.1	Monitor Risks	Track risks.	Risk monitoring report.
4.3.2	Mitigate Risks	Implement actions.	Mitigation plans.
4.3.3	Update Risk Log	Update register.	Updated risk log.
4.4	Feedback Management	Gather improvements.	Feedback summary.
4.4.1	Collect Feedback	Gather feedback.	Feedback forms.
4.4.2	Analyze Feedback	Analyze improvements.	Feedback analysis.
4.4.3	Implement Changes	Apply changes.	Change log.
4.5	Quality Review	Final reviews.	QA documentation.
4.5.1	Quality Checks	Perform audits.	Quality report.
4.5.2	Risk Review	Review risks.	Risk review document.
4.5.3	Final Approval	Get approvals.	Approval sign-off.
5.0	Closing	Wrap up and deliver.	Final documentation, sign-off.
5.1	Final Evaluation	Deploy tested system.	Live agent implementation.
5.1.1	Final Testing	End-to-end testing.	Final test report.

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WBS Code	**Task Name**	**Description**	**Deliverables**
5.1.2	Deployment	Deploy to production.	Deployment log.
5.1.3	Evaluation	Evaluate performance.	Evaluation report.
5.2	Documentation	Record insights.	Project report.
5.2.1	Compile Documentation	Gather documents.	Documentation package.
5.2.2	Lessons Learned	Document lessons.	Lessons learned report.
5.2.3	Final Report	Prepare report.	Project report.
5.3	Handover	Transfer ownership.	Closure report.
5.3.1	Handover Meeting	Conduct handover.	Handover minutes.
5.3.2	Obtain Sign-off	Get sign-off.	Sign-off document.
5.3.3	Close Project	Archive and close.	Closure report.

Table 2.1: Tabular WBS for Cross-Sell Suggestion Agent

Chapter 3

Scope Management Plan

3.1 Purpose

The Scope Management Plan defines, validates, and controls the Cross-Sell Suggestion Agent (CSSA) project scope to align with stakeholder expectations and prevent scope creep.

3.2 Scope Definition Process

1. Requirement Gathering: Interview stakeholders.
2. Requirement Analysis: Prioritize based on value and feasibility.
3. Scope Documentation: Draft Scope Statement.
4. Approval: Submit for review and establish baseline.

3.3 Scope Validation Process

Step	Activity	Responsible	Outcome
1	Submit deliverables	Project Team	Review request
2	Perform testing	QA Team	Validation results
3	Stakeholder review	Project Manager	Approval/feedback
4	Obtain sign-off	Supervisor Agent	Formal acceptance
5	Archive baseline	Documentation Team	Scope record

Table 3.1: Scope Validation Process

3.4 Scope Control Process

1. Change Request: Submit CRF.
2. Impact Analysis: Assess impact.
3. Approval: CCB review.
4. Implementation: Update documents.
5. Monitoring: Track changes.

3.5 Preventing Scope Creep

- Enforce change control.
- Document requirements.
- Conduct reviews.
- Involve stakeholders.
- Perform audits.

3.6 Alignment with Stakeholder Expectations

- Transparent reporting.
- Continuous feedback.
- Scheduled reviews.
- Incremental results.

3.7 Scope Management Roles

Role	Responsibility
Project Manager	Define, control, validate scope.
Development Team	Deliver tasks within scope.
Supervisor Agent	Oversee, provide feedback, approve.
QA Team	Verify deliverables.

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Role	Responsibility
Stakeholders	Review, validate, accept.

Table 3.2: Scope Management Roles and Responsibilities

Chapter 4

Gantt Chart

4.1 Purpose

The Gantt Chart visualizes task timelines, dependencies, and team assignments for the Cross-Sell Agent project.

4.2 Task Scheduling Overview

Phase	Task	Start Date	End Date	Duration	Dependency	Milestone/Deliverable
1. Initiation	Identify Stakeholders	1 Sep 2025	3 Sep 2025	3 days	—	Stakeholder Register
	Define Objectives	4 Sep 2025	8 Sep 2025	5 days	1.1	Project Charter Draft
	Approve Charter	9 Sep 2025	10 Sep 2025	2 days	1.2	Charter Approval
2. Planning	Create WBS	11 Sep 2025	15 Sep 2025	5 days	1.3	WBS Document
	Resource Estimation	16 Sep 2025	20 Sep 2025	5 days	2.1	Resource Sheet
	Develop Schedule	21 Sep 2025	26 Sep 2025	6 days	2.2	Gantt Chart
	Risk Planning	27 Sep 2025	30 Sep 2025	4 days	2.3	Risk Plan
	Design Approval	1 Oct 2025	2 Oct 2025	2 days	2.4	Design Approval
3. Execution	System Design	3 Oct 2025	10 Oct 2025	8 days	2.5	Design Blueprint
	Data Preprocessing	11 Oct 2025	18 Oct 2025	8 days	3.1	Cleaned Dataset

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Phase	Task	Start Date	End Date	Duration	Dependency	Milestone/Deliverable
	Develop Algorithm	19 Oct 2025	30 Oct 2025	12 days	3.2	ML Prototype
	Integration	31 Oct 2025	7 Nov 2025	8 days	3.3	API Integration
	Model Testing	8 Nov 2025	15 Nov 2025	8 days	3.4	Evaluation Report
	Prototype Deployment	16 Nov 2025	20 Nov 2025	5 days	3.5	Deployed Version
4. Monitoring	Testing	21 Nov 2025	28 Nov 2025	8 days	3.6	Validation Report
	Track Progress	29 Nov 2025	3 Dec 2025	5 days	4.1	Progress Reports
	Risk Mitigation	4 Dec 2025	8 Dec 2025	5 days	4.2	Mitigation Updates
	Stakeholder Feedback	9 Dec 2025	12 Dec 2025	4 days	4.3	Feedback Report
	Quality Review	13 Dec 2025	15 Dec 2025	3 days	4.4	QA Sign-Off
5. Closing	Final Evaluation	16 Dec 2025	20 Dec 2025	5 days	4.5	System Launch
	Documentation	21 Dec 2025	23 Dec 2025	3 days	5.1	Final Docs
	Handover	24 Dec 2025	25 Dec 2025	2 days	5.2	Closure Report

Table 4.1: Task Scheduling Overview

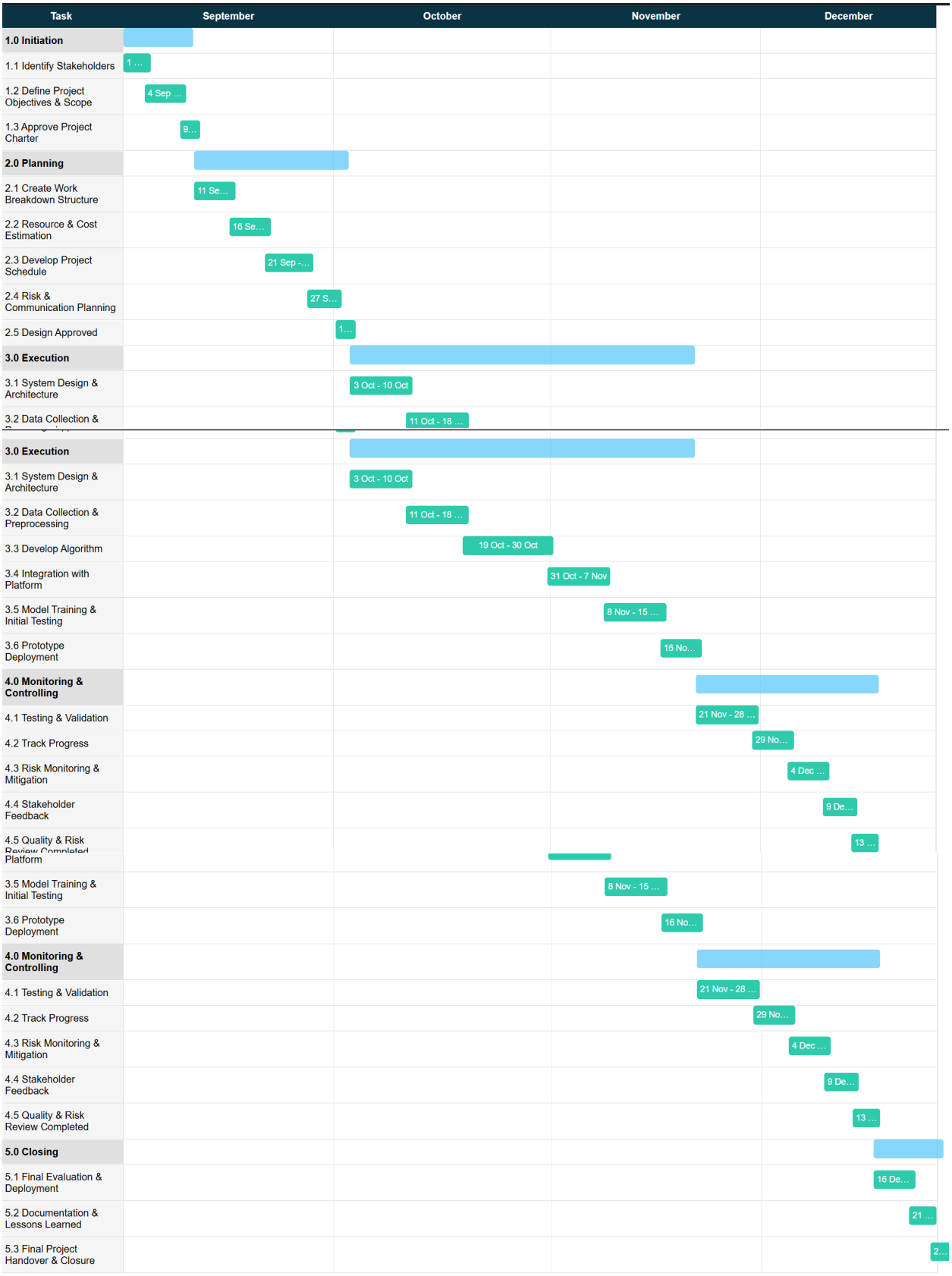

Figure 4.1: Gantt Chart for Cross-Sell Suggestion Agent

4.3 Milestones

Milestone	Target Date	Associated Deliverable
Project Charter Approved	10 Sep 2025	Charter Document
Design Approved	2 Oct 2025	UI & System Design
Prototype Deployment	20 Nov 2025	Deployed Prototype
Quality Review Completed	15 Dec 2025	QA Summary
Final Handover	25 Dec 2025	Final Submission

Table 4.2: Milestones

4.4 Critical Path Activities

Define Objectives → Develop Schedule → System Design → Develop Algorithm → Testing → Final Deployment.

4.5 Tools Used

- TeamGantt/MS Project: Schedule and track.
- Supervisor Agent: Monitor milestones.
- Trello/Jira: Update statuses.

Chapter 5

Scope Verification and Validation Report

5.1 Purpose

This report confirms that Cross-Sell Agent deliverables meet requirements.

5.2 Relation to Scope Processes

Process	Description	Activity	Output
Plan Scope	Define scope process.	Develop Scope Plan.	Approved Plan.
Collect Requirements	Gather needs.	Surveys, traceability matrix.	Requirement Matrix.
Define Scope	Detail scope.	Review objectives.	Approved Statement.
Validate Scope	Accept deliverables.	Milestone reviews.	Acceptance Forms.
Control Scope	Manage changes.	Review requests.	Updated Baseline.

Table 5.1: Relation to Scope Processes

5.3 Verification Steps

Step	Activity	Responsible	Tool/Method	Outcome
1	Review scope	PM, Supervisor	Checklist, meetings	Aligned goals.
2	Verify preprocessing	Dev Team	Unit/Integration Tests	Processed data.

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Step	Activity	Responsible	Tool/Method	Outcome
3	Validate accuracy	QA Team	A/B testing	¿85% relevance.
4	Review integration	Tech Lead	Integration Tests	Seamless APIs.
5	Stakeholder demo	PM	Feedback sessions	Approval.
6	Final review	QA, Docs Team	Checklist, sign-off	Closure approval.

Table 5.2: Verification Steps

5.4 Validation Tools

- Jupyter, Postman, PyTest: Testing.
- MS Project/TeamGantt: Tracking.
- Supervisor Agent: Reporting.
- Checklists: Confirmation.

5.5 Acceptance Criteria

Deliverable	Criteria	Method
System Design Doc	Covers architecture, UI.	Supervisor review.
Algorithm Prototype	85% accuracy.	Testing/validation.
Integrated Agent	Functional integration.	Functional testing.
Documentation	Includes guides, manual.	Stakeholder review.
Final System	Stable performance.	Live demo, acceptance.

Table 5.3: Acceptance Criteria

5.6 Verification Outcomes

Deliverables are reviewed by the Supervisor Agent; non-conformance triggers re-validation.

Chapter 6

Task Assignment and Progress Monitoring

Tasks are assigned via MS Project based on WBS.

MS Project - Task Assignments for Cross-Sell Suggestion Agent

ID	Task Name	Duration	Start	Finish	Resource Names
1	Initiation	10 days	09/01/25	09/10/25	Awaiz Ali Khan
1.1	Identify Stakeholders	3 days	09/01/25	09/03/25	Awaiz Ali Khan
1.2	Define Project Objectives & Scope	5 days	09/04/25	09/08/25	Zain ul Abideen
1.3	Approve Project Charter	2 days	09/09/25	09/10/25	Kamran Ali
2	Planning	22 days	09/11/25	10/02/25	Awaiz Ali Khan
2.1	Create Work Breakdown Structure	5 days	09/11/25	09/15/25	Zain ul Abideen
2.2	Resource & Cost Estimation	5 days	09/16/25	09/20/25	Kamran Ali
2.3	Develop Project Schedule	6 days	09/21/25	09/26/25	Awaiz Ali Khan
2.4	Risk & Communication Planning	4 days	09/27/25	09/30/25	Zain ul Abideen
2.5	Design Approved	2 days	10/01/25	10/02/25	Kamran Ali
3	Execution	49 days	10/03/25	11/20/25	Awaiz Ali Khan

Figure 6.1: Task Assignments in MS Project

MS Project - Progress Tracking for Cross-Sell Suggestion Agent

ID	Task Name	% Complete	Status	Start	Finish	Resource Names
1	Initiation	100%	Completed	09/01/25	09/10/25	Awaiz Ali Khan
1.1	Identify Stakeholders	100%	Completed	09/01/25	09/03/25	Awaiz Ali Khan
1.2	Define Project Objectives & Scope	100%	Completed	09/04/25	09/08/25	Zain ul Abideen
1.3	Approve Project Charter	100%	Completed	09/09/25	09/10/25	Kamran Ali
2	Planning	80%	In Progress	09/11/25	10/02/25	Awaiz Ali Khan
2.1	Create Work Breakdown Structure	100%	Completed	09/11/25	09/15/25	Zain ul Abideen
2.2	Resource & Cost Estimation	100%	Completed	09/16/25	09/20/25	Kamran Ali
2.3	Develop Project Schedule	100%	Completed	09/21/25	09/26/25	Awaiz Ali Khan
2.4	Risk & Communication Planning	50%	In Progress	09/27/25	09/30/25	Zain ul Abideen
2.5	Design Approved	0%	Not Started	10/01/25	10/02/25	Kamran Ali
3	Execution	0%	Not Started	10/03/25	11/20/25	Awaiz Ali Khan

Figure 6.2: Progress Tracking in MS Project