IS333 Assignment 2: AI Customer Service Chatbot Project Management Plan

Source: CoPilot Generated

Group Members

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Conceptualisation

Introduction

In a move that is set to revolutionize the Fijian retail landscape, Vodafone Fiji has launched VitiKart, the nation's first fully-fledged online marketplace. Drawing inspiration from global e-commerce leaders such as Amazon, eBay, and AliExpress, VitiKart mirrors the functionalities of those major e-commerce giants but on a smaller scale as well as provides mobile applications that can be downloaded on both IOS and Android devices, as said by Acting Chief Executive Ronald Prasad (citation). As of now, VitiKart handles over 350 transactions weekly, attracting significant traffic with around 10,000 monthly visits, 107 active merchants use the platform, with a majority of the users being under 30 thus showing the preference and convenience towards shopping online compared visiting retail stores, as said by Vodafone's Head of Brands, Marketing, and Digital, Saileshni Chand (citation 2). However, due to the increasing volume of users, the customer service representatives are not able respond efficiently and as effectively to uphold the set standards that they had previously maintained.

A solution to this is the implementation of an AI-powered chatbot. Many of the e-commerce have started implementing AI-powered chatbots with Amazon introducing their own "Amazon Lex" just this year. Other companies such us eBay and Alibaba also have their own AI-powered chatbots in order to ensure quality, 24/7, customer support in order to ensure customer satisfaction. With these chatbots, customers with inquiries are able to direct their questions to these chatbots in order to be given an expert automated response. The chatbots also do not need to be monitored by other employees as they will act independently, and multiple users are able to converse with the chatbot without it affecting the performance of other simultaneous operating chatbots. Thus, with the implementation of these AI-powered chatbots, VitiKart will be able to run effectively, efficiently, and ensure customer satisfaction.

Project Overview

Project Overview Statement	Project Name: Implementing an AI-Powered Customer Service Chatbot for Viti kart	Project No:001	Project Manager

Problem Statement

Viti kart Fiji is a growing e-commerce company, is encountering challenges as it grows. One of the primary issues is the increasing number of customer inquiries across various channels, including emails, phone calls, and social media. The increase in customer interactions creates inefficiencies, as the existing customer service infrastructure struggles to manage the high demand effectively. As a result, response times are slow, and customer satisfaction is declining. Moreover, the company faces the challenge of maintaining the consistency in responses across different communication platforms. Customers expert prompt and uniform answers, but the current approach can lead to confusion and error.

Goal:

The main goal of this project is to improve efficiency and customer satisfaction of VitiKart by using project management techniques to tackle the current issue of the increasing number of users through various channels such as emails, phone calls, and social media. This will be done by implementing an AI-powered customer service chatbot in order to assists users by answering their queries.

1. **Objectives**

2. Enhance customer service efficiency by implementing an AI-powered chatbot to handle a large volume of customer inquiries efficiently, reducing response times and freeing up human agents for more complex tasks.

3. Reduce operational costs through lowering the costs associated with customer service operations by automating routine inquiries and reducing the need for human intervention.

4. Promote new products and services use the chatbot to introduce and promote the new products, services, and special offers to customers, driving additional sales and interest.

5. Multilingual support: provide support in multiple languages to cater to a diverse customer base.

Success and Criteria

- Viti kart's AI-powered chatbot should be able to efficiently handle and reduce the response time for customer inquiries across all channels (email, phone calls, and social media).

- Viti kart's AI-powered chatbot should resolve at least 80% of customer inquiries without needing human intervention.

- The AI-powered chatbot should integrate smoothly with the existing customer relationship management (CRM) and enterprise resource planning (ERP) systems.

- The AI-powered chatbot system should provide round-the-clock support to cater to customers.
- Feedback and improvement mechanism for customers to provide input on their experience.
- Should be completed within the budget $100,000.
- Should be completed within the timeline of 8 months

Risk Assumptions

- Insufficient testing and maintenance: if the chatbot is not properly tested and maintained, it may fail to provide accurate responses.

- Integrating the chatbot with the exiting CRM and ERP systems might encounter technical difficulties, potentially leading to delays in implementation.

- Inadequate training data the chatbots effectiveness relies on quality training data. If the training data is insufficient or not representative of actual customer inquiries, the chat may provide irrelevant or incorrect responses.

Prepared by :	**Date : 16 may 2024**	

Project Charter

Project Title: Implementation of AI-Chatbot for VitiKart

Scope and Objectives:

This project aims at designing and developing a chat box powered by AI which is a customer service for VitiKart. This process includes analysing the current customer service system incorporated by Vodafone and looking to transform that into an AI chatbot and make improvement for further efficiency.

Overview:

Vodafone plans to implement an AI powered chatbot to handle customer service that will see an increase in efficiency and enhance customer satisfaction. the project includes developing a new system, integrating it with current systems can proceeding with thorough testing. The AI chatbot aims to provide 24-hour service to customers which is an improvement from the timely human interaction it was based on before. Staff will be trained to use the chatbot. With the budget of $100 000 and a timeline of 8 months, this project aims to deliver a user-friendly solution.

General Objectives:

The overall objectives of the implementation of the AI-powered customer service chatbot of Vodafone are to gain an overall increase in operational efficiency, to improve customer satisfaction, and to take away some of the load off from the customer service agents. The project will take advantage of the advanced technologies of artificial intelligence and natural language processing to create an easy, responsive, and scalable customer support system that can deal with a growing volume of inquiries across a variety of channels.

Specific Objectives:

- **Reduced response time**- automated to inquires will result in a quicker response time to customers.
- **24/7 Customer Support**- instead of having operation hours, Vodafone Customer Service will now be active 24 hours a day and 7 days a week.
- **Operational cost reduction**- by having an AI as a customer service agent/ device, all human employees are freed for other tasks.
- **Highly reliable**- develop an AI system that is highly dependable and accurate.
- **Customer Satisfaction-** ensure system is user friendly.
- **Be able to answer customer queries** – the system must be able to process user requests, process them, and then output the correct information that will answer the customer's questions.

Defining Conditions and Constraints:

- The project must be completed within the budget of $100,000.
- The project should finish within the given timeline (8 months)

Milestones:

Phase	Milestone	Deadline
Conceptualization Report	Project initiation	4/7/24
Planning Report	Project plan approved	23/8/24
Execution Report	Chatbot deployed	14/1/25
Termination Report	Project Completion	4/2/25

Project Organization:

Key members of the project team are:

1. Project Manager, Aryan Sharma

2. Business Analyst, Jay Naidu

3. Customer Support Specialist, Cristiano Ronaldo

4. System Architect, Pui Chen

5. AI Engineer, Pranav Chand

6. Fullstack Developer, Shivam Goundan

7. Quality Assurance Engineer, Lionel Messi

8. Team members: No more than two additional team members from the disciplinary functions will be appointed, based on recommendations from the disciplinary representatives. All team members will be 100% dedicated to the project for a period of not less than 90 business days.

Project Manager Responsibilities:

1. **Resource Allocation**- distribute and manage resources accordingly and ensure resources are within the budget.

2. **Risk Management**- identify any potential risks that may arise and develop strategies to deal with these risks.

3. **Timeframe Management**- project manager will always need to adhere to the fact that everything is being done on time and the estimated finish date is not beyond the 8-month period.

4. **Support**- as a leader, it is the manager's job to ensure all team members are motivated and up to standard.

5. **Manage stakeholders**- often in big projects, all stakeholders like to be kept in the loop of what's going on and the manager will need to provide them with constant updates.

6. **Staffing**- the project manager will be responsible for the performance of all the members of the team. Additional staff support may be available upon request.
7. **Status Updates**- stakeholders will be informed of current processes throughout the lifetime of the project.

Authority

The project manager will have full authority to identify necessary tasks and resources needed to help complete the project. The project manager will deal with all types of conflicts.

Approvals:

Vice President Engineering _____

Vice President Supply Chain and Procurement _____

Vice President Commercial _____

Vice President Human Resources _____

President and CEO _____

Work Breakdown Structure

WBS Definition Table

Key: Deliverable Milestone

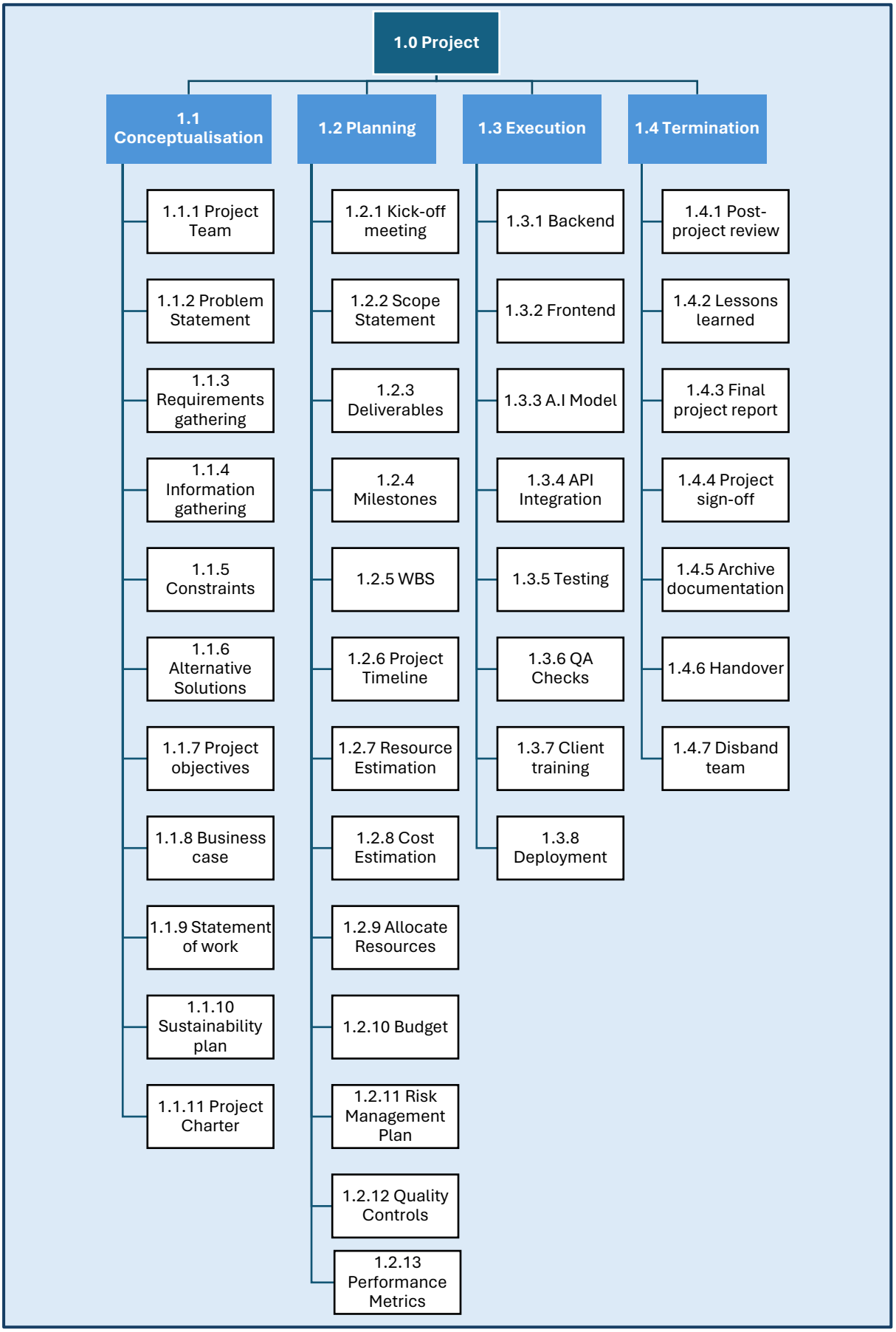
Level	WBS Code	Element Name	Definition
1	**1.0**	**Customer Service AI Chatbot Project**	**All work needed to implement an AI Powered Customer Service Chatbot**
2	**1.1**	**Conceptualisation**	**The work to conceptualise and initiate the project.**
3	1.1.1	Assemble project team	This involves identifying the roles and responsibilities needed for the project, selecting team members based on their skills and availability, and assigning specific roles to each member.
	1.1.2	Develop problem statement	Analysing the current situation to identify gaps or inefficiencies, and drafting a concise problem statement that captures the core issue. The problem statement will then be validated with stakeholders to ensure it accurately reflects their concerns.
	1.1.3	Requirements gathering	Conducting interviews, surveys, and workshops with stakeholders to understand their needs, documenting both functional and non-functional requirements, and prioritizing these requirements based on stakeholder input and project goals.
	1.1.4	Information gathering	Involves collecting relevant data and information to inform project decisions. It includes identifying sources of information such as market research, industry reports, and internal data, collecting and organizing data from these sources, and analysing the information to identify trends and insights.
	1.1.5	Outline project objectives	Define clear and achievable project objectives. It involves collaborating with stakeholders to understand their goals and expectations, drafting specific, measurable, achievable, relevant, and time-bound (SMART) objectives, and aligning these objectives with organizational goals and strategies.
	1.1.6	Identify & analyse constraints	Identifying constraints such as budget, time, resources, and technology, analysing the potential impact of each constraint on the project, and developing strategies to mitigate or manage these constraints.
	1.1.7	Analysis of alternative solutions	Evaluate different approaches to solving the project problem. It involves identifying potential solutions, assessing the feasibility, benefits, and risks of each alternative, and comparing them using criteria such as cost, time, and impact. Based on this analysis, the most viable solution will be recommended.

	1.1.8	Construct the Business Case	Develop a comprehensive business case to justify the project. It includes summarizing the problem statement and project objectives, outlining proposed solutions and their benefits, conducting a cost-benefit analysis, identifying risks and mitigation strategies, and presenting the business case to stakeholders for approval
	1.1.9	Develop the Statement of Work	Create a detailed document outlining the project scope and deliverables. This includes defining the project scope, specifying project timelines and milestones, outlining roles and responsibilities of the project team, and including acceptance criteria and quality standards
	1.1.10	Outline Sustainability Plan	Identifying sustainability goals related to environmental, social, and economic factors, developing strategies to achieve these goals, integrating sustainability considerations into project planning and execution, and monitoring and reporting on sustainability performance throughout the project lifecycle.
	1.1.11	Develop the Project Charter	Create a formal document that authorizes the project and outlines key details. This includes defining the project's purpose, objectives, and scope, identifying key stakeholders and their roles, outlining the project timeline and major milestones, specifying the project budget and resources required, and obtaining formal approval and sign-off from project sponsors and stakeholders.
	Milestone: Project Charter signed off. Project Initiated		
2	**1.2**	**Planning**	
3	1.2.1	Conduct Project kick-off meeting	This meeting will introduce the project to all team members and stakeholders, outline the project objectives and scope, and clarify roles and responsibilities. The kick-off meeting will also provide an opportunity to address any initial questions and ensure everyone is aligned and understands the project plan.
	1.2.2	Define project scope statement	It includes identifying the project's objectives, deliverables, boundaries, and constraints.
	1.2.3	Establish deliverables	It involves identifying and defining the major outputs that the project will produce, such as reports, software modules, or completed systems. Each deliverable will be clearly described, including its acceptance criteria and delivery schedule.
	1.2.4	Identify key milestones	Identifying key milestones that mark significant points or achievements in the project timeline.

	1.2.5	Prepare WBS	Identifying all the tasks and subtasks required to complete the project and organizing them hierarchically.
	1.2.6	Construct project timeline	Sequencing the tasks identified in the WBS, estimating the duration for each task, and creating a timeline that shows the start and end dates for all tasks and milestones.
	1.2.7	Conduct resource estimation	Identifying the types and quantities of resources needed, such as personnel, equipment, and materials.
	1.2.8	Conduct cost estimation	Identifying all potential costs, such as labour, materials, equipment, and overheads, and calculating the total budget required.
	1.2.9	Allocate resources	Assigning personnel, equipment, and materials to various activities based on the resource estimation.
	1.2.10	Compile budget	Aggregating the estimated costs for all tasks and activities to create a comprehensive budget.
	1.2.11	Outline Risk Management Plans	Identifying possible risks, analysing their impact and likelihood, and developing strategies to manage or mitigate them. The risk management plans will be documented and communicated to the project team to ensure proactive risk management.
	1.2.12	Define quality controls	Identifying quality criteria, establishing quality assurance processes, and setting up quality control measures
	1.2.13	Establish performance metrics	Identifying key performance indicators (KPIs) and metrics that will be used to assess project progress and performance.
	Milestone: Project Plan documents approved		
2	**1.3**	**Execution**	
3	1.3.1	Develop Backend Systems	Designing and implementing the server-side logic, database structures, and APIs that support the chatbot's functionality. Tasks include setting up the server environment, creating database schemas, and coding the backend services.
	1.3.2	Develop Frontend Systems	Creating the user interface and user experience components that users will interact with. Tasks include designing the UI layout, developing responsive web or mobile interfaces, and integrating the frontend with the backend services.
	1.3.3	Train A.I. Model	Preparing the training data, selecting, and configuring the AI algorithms, and running training sessions to develop the model. Tasks include data preprocessing, model training, and evaluation to ensure the AI model meets performance requirements. Continuous iteration and tuning may be needed to achieve optimal results.

	1.3.4	Integrate with external APIs	Integrating the chatbot with both external and internal APIs to extend its functionality and access additional services.
	1.3.5	Testing	Writing and executing tests for individual units of code and for interactions between the entire system.
	1.3.6	Quality Assurance Checks	Involve systematically reviewing project deliverables, processes, and outcomes to ensure they meet predefined quality standards and requirements.
	1.3.7	Conduct client training	Conduct training sessions for clients to ensure they can effectively use and manage the chatbot. This involves creating training materials, such as user manuals and video tutorials, and organizing training workshops or webinars.
	1.3.8	Deployment	Deploying the chatbot system to a production environment where it will be available for end-users.
	Milestone: Chatbot Deployed		
2	**1.4**	**Termination**	
3	1.4.1	Conduct post-project review	Conduct a comprehensive review of the project after its completion
	1.4.2	Conduct lessons learned analysis	Reviewing the documented feedback from the post-project review, identifying key lessons, and discussing them with the project team. Tasks include categorizing lessons learned, determining best practices, and documenting the analysis.
	1.4.3	Final Project Report	Compile and deliver the final project report. This report summarizes the entire project, including objectives, scope, deliverables, timelines, costs, and outcomes.
	1.4.4	Project Sign-off Document	Creating a formal document that signifies the completion and acceptance of the project by the client or stakeholders.
	1.4.5	Archive documentation	Archive all project documentation for future reference. This involves collecting all project-related documents, including reports, emails, plans, and notes, and organizing them in a structured manner.
	1.4.6	Handover relevant documents to client	Identifying the documents that the client will need for ongoing operations or maintenance, such as user manuals, training materials, and technical specifications.
	1.4.7	Disband team	Formally disband the project team and reassign resources back to functional departments.
	Milestone: Successful Project Closure		

WBS Graph


1.0 Project
1.1 Conceptualisation
1.2 Planning
1.3 Execution
1.4 Termination
1.1.1 Project Team
1.1.2 Problem Statement
1.1.3 Requirements gathering
1.1.4 Information gathering
1.1.5 Constraints
1.1.6 Alternative Solutions
1.1.7 Project objectives
1.1.8 Business case
1.1.9 Statement of work
1.1.10 Sustainability plan
1.1.11 Project Charter
1.2.1 Kick-off meeting
1.2.2 Scope Statement
1.2.3 Deliverables
1.2.4 Milestones
1.2.5 WBS
1.2.6 Project Timeline
1.2.7 Resource Estimation
1.2.8 Cost Estimation
1.2.9 Allocate Resources
1.2.10 Budget
1.2.11 Risk Management Plan
1.2.12 Quality Controls
1.2.13 Performance Metrics
1.3.1 Backend
1.3.2 Frontend
1.3.3 A.I Model
1.3.4 API Integration
1.3.5 Testing
1.3.6 QA Checks
1.3.7 Client training
1.3.8 Deployment
1.4.1 Post-project review
1.4.2 Lessons learned
1.4.3 Final project report
1.4.4 Project sign-off
1.4.5 Archive documentation
1.4.6 Handover
1.4.7 Disband team

Skills Inventory

Skills	Aryan Sharma *Project Manager*	Jay Naidu *Business Analyst*	Cristiano Ronaldo *Customer Support Specialist*	Pui Chen *System Architect*	Pranav Chand *AI Engineer*	Shivam Goundan *Fullstack Developer*	Lionel Messi *Quality Assurance Engineer*
RESC (Resourcing)	✓						
PEMT (Project management)	✓						
BUAN (Business analysis)		✓					
REQM (Requirements definition and management)		✓					
INAN (Information analysis)		✓					
DATM (Data management)		✓					
PROF (Portfolio, program, and project support)	✓						
RSKT (Risk management)		✓					
CNSL (Consultancy)							
BUSM (Business modelling)		✓					
FMIT (Financial management)							

ITMG (IT management)				✓			
SUST (Sustainability management)							
EMRG (Emerging technology monitoring)				✓			
GOVN (Governance)	✓						
RLMT (Stakeholder relationship management)	✓		✓				
DESN (Systems design)				✓		✓	
DBDS (Database design)				✓		✓	
PROG (Programming/software development)					✓	✓	
INTD (Interaction design)						✓	
MLNG (Machine learning)					✓		
DTAN (Data analysis)					✓		
SINT (Systems integration)				✓	✓	✓	

TEST (Testing)							✓
INAS (Information assurance)							✓
QUAS (Quality assurance)							✓
QUAP (Quality assurance management)							✓
ETMG(Learning and development management)			✓				
TECH (Technical specialism)			✓				
DEPL (Deployment management)						✓	
HSIN (Systems installation/decommissioning)						✓	
KNOW (Knowledge management)	✓	✓					✓
DOCM (Document management)	✓						✓
IRMG (Information management)	✓	✓					

Needs Inventory

	Skills Needed									
Task & Code	**RESC (Resourcing)**	**PEMT (Project management)**	**BUAN (Business analysis)**	**REQM (Requirements definition and management)**	**INAN (Information analysis)**	**RSKT (Risk management)**	**DATM (Data Management)**	**FMIT (Financial management)**	**ITMG (IT management)**	**SUST**
1.1.1 Assemble project team.	✓	✓								
1.1.2 Develop problem statement.			✓	✓						
1.1.3 Requirements gathering			✓	✓						
1.1.4 Information gathering					✓		✓			
1.1.5 Outline project objectives		✓	✓							
1.1.6 Identify & analyse constraints.			✓			✓				
1.1.7 Analysis of alternative solutions			✓							
1.1.8 Construct the Business Case			✓					✓		
1.1.9 Develop the Statement of Work		✓							✓	
1.1.10 Outline Sustainability Plan										✓

1.1.11 Develop the Project Charter		✓								

Task & Code	RESC (Resourcing)	PEMT (Project management)	BUAN (Business analysis)	QUAS (Quality Assurance)	METL (Measurement)	RSKT (Risk management)	PROF (Portfolio, program and project support)	FMIT (Financial management)
1.2.1 Conduct Project kick-off meeting		✓						
1.2.2 Define project scope statement		✓	✓					
1.2.3 Establish deliverables		✓						
1.2.4 Identify key milestones							✓	
1.2.5 Prepare WBS		✓					✓	
1.2.6 Construct project timeline		✓					✓	
1.2.7 Conduct resource estimation	✓	✓						
1.2.8 Conduct cost estimation	✓	✓						
1.2.9 Allocate resources	✓	✓						
1.2.10 Compile budget	✓							✓
1.2.11 Outline Risk Management Plans	✓					✓		

1.2.12 Define quality controls				✓	✓				
1.2.13 Establish performance metrics				✓	✓				

Task & Code	DESN (Systems design)	DBDS (Database design)	PROG (Programming/software development)	INTD (Interaction design)	MLNG (Machine learning)	DTAN (Data analysis)	SINT (Systems integration)	TEST (Testing)	QUAS (Quality assurance)	ETMG (Learning and development management)	DEPL (Deploy-ment
1.3.1 Develop Backend Systems	✓	✓	✓								
1.3.2 Develop Frontend Systems	✓		✓	✓							
1.3.3 Train A.I. Model			✓		✓	✓					
1.3.4 Integrate with external APIs			✓				✓				
1.3.5 Testing								✓	✓		
1.3.6 Quality Assurance checks									✓		
1.3.7 Conduct client training										✓	
1.3.8 Deployment											✓

Responsibility Assignment Matrix

Key:

○ Responsible	☐ Notification
◊ Support	● Approval

Deliverable	Task & Code	Project Personnel: Aryan Sharma *Project Manager*	Jay Naidu *Business Analyst*	Cristiano Ronaldo *Customer Support Specialist*	Pui Chen *System Architect*	Pranav Chand *AI Engineer*	Shivam Goundan *Fullstack Developer*	Lionel Messi *Quality Assurance Engineer*
1.0 Conceptualisation	1.1.1 Assemble project team.	○	☐					
	1.1.2 Develop problem statement.	●	○	◊				
	1.1.3 Requirements gathering	●	○	◊				
	1.1.4 Information gathering	☐	○	◊				
	1.1.5 Outline project objectives	○	☐	◊				
	1.1.6 Identify & analyse constraints.	●	○					
	1.1.7 Analysis of alternative solutions	☐	○	◊				
	1.1.8 Construct the Business Case	☐	○	◊				
	1.1.9 Develop the Statement of Work	○	◊					
	1.1.10 Outline Sustainability Plan	○	◊					
	1.1.11 Develop the Project Charter	○	◊					

1.2 Planning	1.2.1 Conduct Project kick-off meeting	○	◊					
	1.2.2 Define project scope statement	○	◊					
	1.2.3 Establish deliverables	○		◊	◊			
	1.2.4 Identify key milestones	○		◊	◊			
	1.2.5 Prepare WBS	○		◊	◊			
	1.2.6 Construct project timeline	○	□					
	1.2.7 Conduct resource estimation	●	○					
	1.2.8 Conduct cost estimation	□	○					
	1.2.9 Allocate resources	○			◊			
	1.2.10 Compile budget	○	□					
	1.2.11 Outline Risk Management Plans	●	○					□
	1.2.12 Define quality controls	●		◊				○
	1.2.13 Establish performance metrics	●		◊			□	○
1.3 Execution	1.3.1 Develop Backend Systems				◊		○	●
	1.3.2 Develop Frontend Systems				◊	□	○	●
	1.3.3 Train A.I. Model					○	□	●

	1.3.4 Integrate with external APIs				◊		○	●
	1.3.5 Testing	●			◊		◊	○
	1.3.6 Quality Assurance checks	●		☐			◊	○
	1.3.7 Conduct client training	●		○			☐	
	1.3.8 Deployment		☐				○	
1.4 Termination	1.4.1 Conduct post-project review	●	○					
	1.4.2 Conduct lessons learned analysis	☐	○					
	1.4.3 Final Project Report	○						
	1.4.4 Project Sign-off Document	○	☐					
	1.4.5 Archive documentation	☐	○					
	1.4.6 Handover relevant documents to client	○						
	1.4.7 Disband team	○						

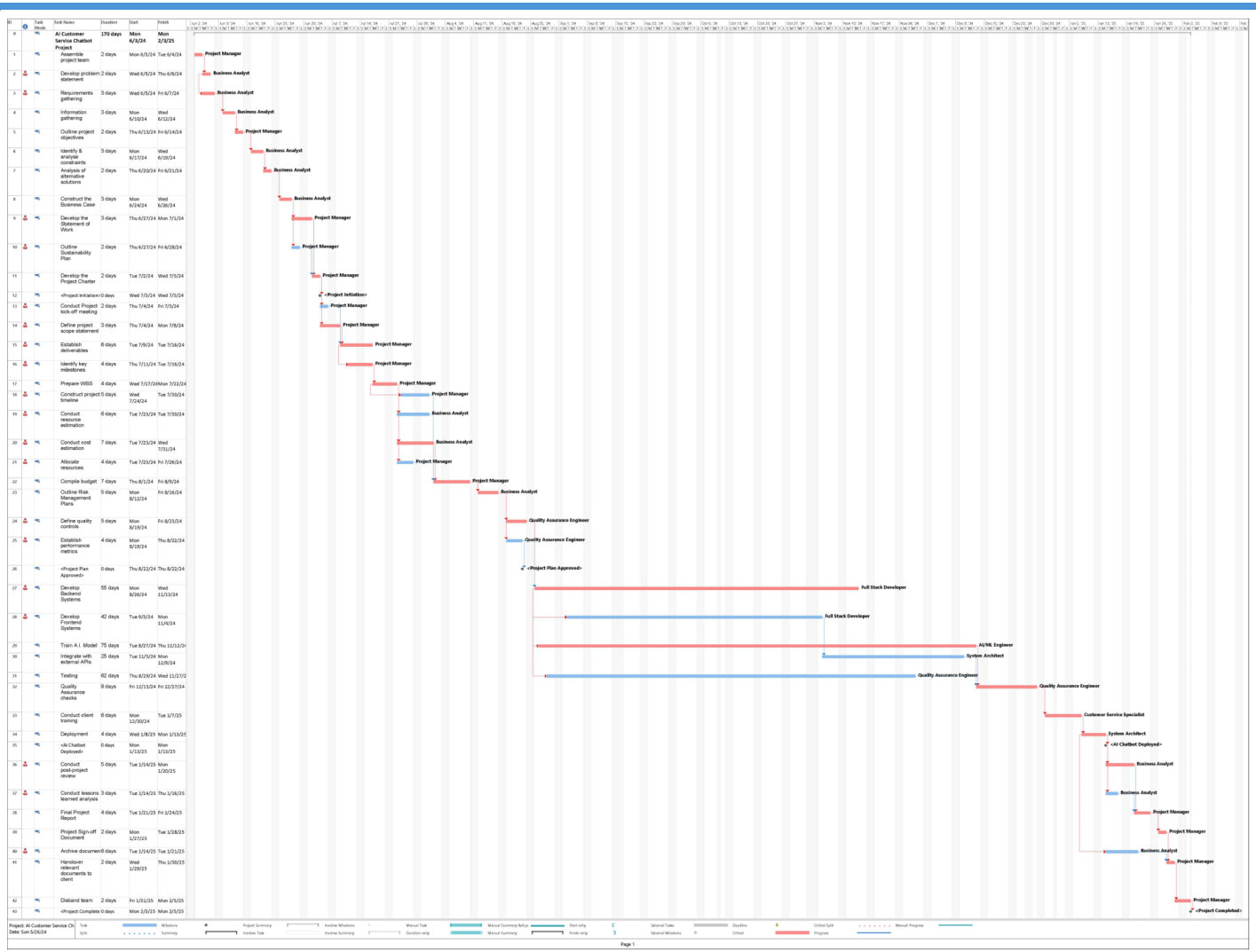
Task Duration Estimation

$$Estimated\ Time = \frac{a + 4m + b}{7}$$

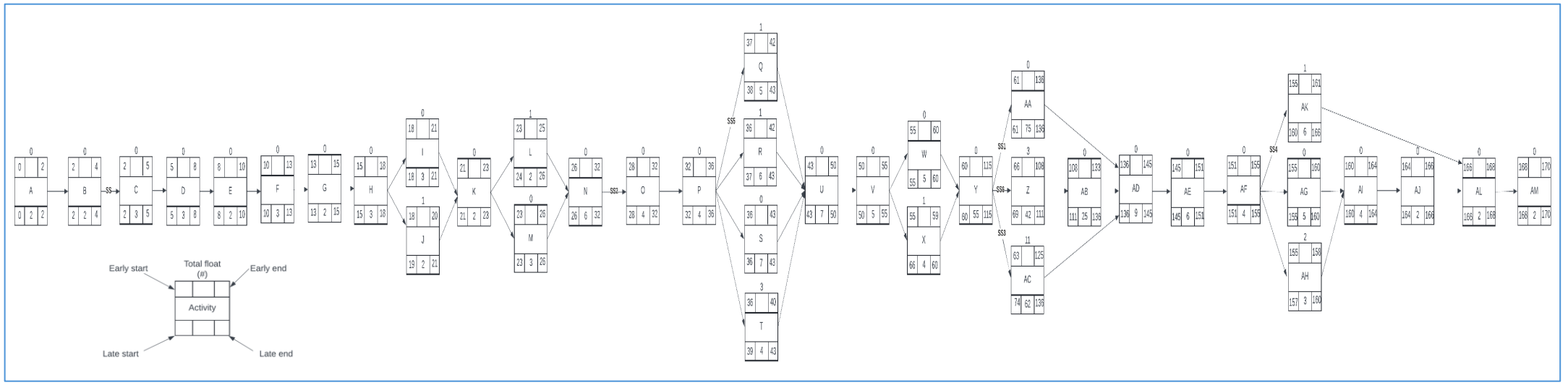
Activity	Activity Name	Optimistic	Most Likely	Pessimistic	Estimated Duration	Predecessor
A	Assemble project team	1	2	4	2	-
B	Develop problem statement	1	2	5	2	A
C	Requirements gathering	2	3	5	3	(SS) B
D	Information gathering	2	3	4	3	C
E	Outline project objectives	1	2	3	2	D
F	Identify & analyse constraints	2	3	4	3	E
G	Analysis of alternative solutions	1	2	3	2	F
H	Construct the Business Case	2	3	4	3	G
I	Develop the Statement of Work	2	3	5	3	H
J	Outline Sustainability Plan	1	2	3	2	H
K	Develop the Project Charter	1	2	3	2	I, J
L	Conduct Project kick-off meeting	1	2	3	2	K
M	Define project scope statement	2	3	5	3	K
N	Establish deliverables	5	6	7	6	L,M
O	Identify key milestones	3	4	5	4	(SS2) N
P	Prepare WBS	3	4	5	4	O
Q	Construct project timeline	4	5	8	5	(SS5) P

R	Conduct resource estimation	5	6	7	6	P
S	Conduct cost estimation	6	7	8	7	P
T	Allocate resources	3	4	5	4	P
U	Compile budget	6	7	9	7	Q,R,S,T
V	Outline Risk Management Plans	4	5	6	5	U
W	Define quality controls	3	5	6	5	V
X	Establish performance metrics	3	4	5	4	V
Y	Develop Backend Systems	45	55	65	55	W,X
Z	Develop Frontend Systems	32	40	58	42	(SS6) Y
AA	Train A.I. Model	71	74	80	75	(SS1) Y
AB	Integrate with external APIs	10	24	45	25	Z
AC	Testing	40	65	70	62	(SS3) Y
AD	Quality Assurance	6	9	12	9	AA,AB,AC
AE	Conduct client training	5	6	7	6	AD
AF	Deployment	3	4	5	4	AE
AG	Conduct post-project review	4	5	6	5	AF
AH	Conduct lessons learned analysis	2	3	6	3	AF
AI	Final Project Report	2	4	5	4	AG,AH
AJ	Project Sign-off Document	1	2	3	2	AI
AK	Archive documentation	4	6	8	6	(SS4) AF
AL	Handover relevant documents to client	1	2	3	2	AJ,AK
AM	Disband team	1	2	3	2	AL

Gantt Chart



Network Diagram



Critical Path: ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM'] **CRITICAL PATH**

Other Paths:

1. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
2. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
3. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
4. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
5. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
6. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
7. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
8. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
9. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
10. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
11. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
12. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
13. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
14. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
15. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
16. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
17. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
18. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
19. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
20. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
21. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
22. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
23. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
24. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
25. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
26. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
27. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
28. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
29. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']

30. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
31. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
32. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
33. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
34. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
35. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
36. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
37. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
38. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
39. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
40. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
41. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
42. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
43. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
44. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
45. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
46. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
47. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
48. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
49. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
50. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
51. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
52. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
53. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
54. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
55. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
56. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
57. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
58. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
59. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
60. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']

61. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
62. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
63. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
64. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
65. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
66. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
67. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
68. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
69. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
70. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
71. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
72. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
73. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM'] **CRITICAL PATH**
74. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
75. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
76. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
77. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
78. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
79. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
80. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
81. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
82. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
83. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
84. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
85. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
86. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
87. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
88. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
89. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
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91. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']

92. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
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94. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
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96. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'I', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
97. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
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123. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
124. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
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126. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
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132. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
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134. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
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137. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
138. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
139. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
140. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
141. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
142. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
143. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
144. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'L', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
145. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
146. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
147. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
148. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
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151. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
152. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
153. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']

154. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
155. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
156. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'Q', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
157. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
158. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
159. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
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163. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
164. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
165. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'R', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
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176. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
177. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
178. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
179. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
180. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'S', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
181. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
182. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
183. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
184. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']

185. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
186. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'W', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
187. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
188. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AA', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
189. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
190. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'Z', 'AB', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']
191. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AG', 'AI', 'AJ', 'AL', 'AM']
192. ['A', 'B', 'C', 'D', 'E', 'F', 'G', 'H', 'J', 'K', 'M', 'N', 'O', 'P', 'T', 'U', 'V', 'X', 'Y', 'AC', 'AD', 'AE', 'AF', 'AH', 'AI', 'AJ', 'AL', 'AM']

Budget

WBS CODE	Activities	Responsibility	Hours Needed	PayRate	OverHead	Personal Time	RESOURCE				TOTAL COST PER PHASE
							Human Resource	Facilities	Equipments	Materials	
	Conceptualisation										
1.1.1	Assemble project team	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	
1.1.2	Develop problem statement	BA	16	$ 14.18	$ 1.25	1.2	$ 340.32	$ 17.02	$ 6.81	$ 3.40	
1.1.3	Requirements gathering	BA	24	$ 14.18	$ 1.25	1.2	$ 510.48	$ 25.52	$ 10.21	$ 5.10	
1.1.4	Information gathering	BA	24	$ 14.18	$ 1.25	1.2	$ 510.48	$ 25.52	$ 10.21	$ 5.10	
1.1.5	Outline project objectives	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	
1.1.6	Identify & analyse constraints	BA	24	$ 14.18	$ 1.25	1.2	$ 510.48	$ 25.52	$ 10.21	$ 5.10	
1.1.7	Analysis of alternative solutions	BA	16	$ 14.18	$ 1.25	1.2	$ 340.32	$ 17.02	$ 6.81	$ 3.40	
1.1.8	Construct the Business Case	BA	24	$ 14.18	$ 1.25	1.2	$ 510.48	$ 25.52	$ 10.21	$ 5.10	
1.1.9	Develop the Statement of Work	PM	24	$ 24.04	$ 1.25	1.2	$ 865.44	$ 43.27	$ 17.31	$ 8.65	
1.1.10	Outline Sustainability Plan	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	
1.1.11	Develop the Project Charter	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	
	Sub Total For Conceptualisation						**$ 5,895.84**	**$ 294.79**	**$ 117.92**	**$ 58.96**	**$ 6,367.51**

	Planning										
1.2.1	Conduct Project kick-off meeting	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	
1.2.2	Define project scope statement	PM	24	$ 24.04	$ 1.25	1.2	$ 865.44	$ 43.27	$ 17.31	$ 8.65	
1.2.3	Establish deliverables	PM	24	$ 24.04	$ 1.25	1.2	$ 865.44	$ 43.27	$ 17.31	$ 8.65	
1.2.4	Identify key milestones	PM	32	$ 24.04	$ 1.25	1.2	$ 1,153.92	$ 57.70	$ 23.08	$ 11.54	
1.2.5	Prepare WBS	PM	32	$ 24.04	$ 1.25	1.2	$ 1,153.92	$ 57.70	$ 23.08	$ 11.54	
1.2.6	Construct project timeline	PM	40	$ 24.04	$ 1.25	1.2	$ 1,442.40	$ 72.12	$ 28.85	$ 14.42	
1.2.7	Conduct resource estimation	BA	48	$ 14.18	$ 1.25	1.2	$ 1,020.96	$ 51.05	$ 20.42	$ 10.21	
1.2.8	Conduct cost estimation	BA	56	$ 14.18	$ 1.25	1.2	$ 1,191.12	$ 59.56	$ 23.82	$ 11.91	
1.2.9	Allocate resources	PM	32	$ 24.04	$ 1.25	1.2	$ 1,153.92	$ 57.70	$ 23.08	$ 11.54	
1.2.10	Compile budget	PM	56	$ 24.04	$ 1.25	1.2	$ 2,019.36	$ 100.97	$ 40.39	$ 20.19	
1.2.11	Outline Risk Management Plans	BA	40	$ 14.18	$ 1.25	1.2	$ 850.80	$ 42.54	$ 17.02	$ 8.51	
1.2.12	Define quality controls	QAE	40	$ 16.35	$ 1.25	1.2	$ 981.00	$ 49.05	$ 19.62	$ 9.81	
1.2.13	Establish performance metrics	QAE	32	$ 16.35	$ 1.25	1.2	$ 784.80	$ 39.24	$ 15.70	$ 7.85	
	Sub Total For Planning						**$ 14,060.04**	**$ 703.00**	**$ 281.20**	**$ 140.60**	**$ 15,184.84**
	Execution										
1.3.1	Develop Backend Systems	FST	220	$ 20.87	$ 1.25	1.2	$ 6,887.10	$ 344.36	$ 137.74	$ 68.87	

1.3.2	Develop Frontend Systems	FST	168	$ 20.87	$ 1.25	1.2	$ 5,259.24	$ 262.96	$ 105.18	$ 52.59	
1.3.3	Train A.I. Model	AI ENG	600	$ 31.23	$ 1.25	1.2	$ 28,107.00	$ 1,405.35	$ 562.14	$ 281.07	
1.3.4	Integrate with external APIs	FST	200	$ 20.87	$ 1.25	1.2	$ 6,261.00	$ 313.05	$ 125.22	$ 62.61	
1.3.5	Testing	QAE	496	$ 16.35	$ 1.25	1.2	$ 12,164.40	$ 608.22	$ 243.29	$ 121.64	
1.3.6	Quality Assurance Checks	QAE	72	$ 16.35	$ 1.25	1.2	$ 1,765.80	$ 88.29	$ 35.32	$ 17.66	
1.3.7	Conduct client training	CUS	48	$ 8.65	$ 1.25	1.2	$ 622.80	$ 31.14	$ 12.46	$ 6.23	
1.3.8	Deployment	SA	32	$ 19.23	$ 1.25	1.2	$ 923.04	$ 46.15	$ 18.46	$ 9.23	
	Sub Total For Execution						**$ 61,990.38**	**$ 3,099.52**	**$ 1,239.81**	**$ 619.90**	**$ 66,949.61**
	Termination										
1.4.1	Conduct post-project review	BA	40	$ 14.18	$ 1.25	1.2	$ 850.80	$ 42.54	$ 17.02	$ 8.51	
1.4.2	Conduct lessons learned analysis	BA	24	$ 14.18	$ 1.25	1.2	$ 510.48	$ 25.52	$ 10.21	$ 5.10	
1.4.3	Final Project Report	PM	32	$ 24.04	$ 1.25	1.2	$ 1,153.92	$ 57.70	$ 23.08	$ 11.54	
1.4.4	Project Sign-off Document	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	
1.4.5	Archive documentation	BA	48	$ 14.18	$ 1.25	1.2	$ 1,020.96	$ 51.05	$ 20.42	$ 10.21	
1.4.6	Handover relevant documents to client	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	

1.4.7	Disband team	PM	16	$ 24.04	$ 1.25	1.2	$ 576.96	$ 28.85	$ 11.54	$ 5.77	
Sub Total For Termination							**$ 5,267.04**	**$ 263.35**	**$ 105.34**	**$ 52.67**	**$ 5,688.40**
TOTAL							**$ 87,213.30**	**$ 4,360.67**	**$ 1,744.27**	**$ 872.13**	

TOTAL RESOURCE COST	**$ 94,190.36**
OVERHEAD COST	
25% of the Total Human Resource	$ 21,803.33
TOTAL OVERHEAD COST	**$ 21,803.33**
Hardware Maintenance Cost	$ 1,500.00
Software and Licensing Cost	$ 3,400.82
Contingency Funds	$ 908.82
TOTAL COST	**$ 5,809.64**
TOTAL COST OF THE PROJECT	**$ 100,000.00**

Summary Budget

Budget Summary of AI Powered Chatbot	
Task	**Cost**
Conceptualisation	
Human Resource	$ 5,895.84
Facility	$ 294.79
Equipment	$ 117.92
Materials	$ 58.96
Sub Total	**$ 6,367.51**
Planning	
Human Resource	$ 14,060.04
Facility	$ 703.00
Equipment	$ 281.20
Materials	$ 140.60
Sub Total	**$ 15,184.84**
Execution	
Human Resource	$ 61,990.38
Facility	$ 3,099.52
Equipment	$ 1,239.81
Materials	$ 619.90
Sub Total	**$ 66,949.61**
Termination	
Human Resource	$ 5,267.04
Facility	$ 263.35
Equipment	$ 105.34
Materials	$ 52.67
Sub Total	**$ 5,688.40**
Full Loaded Cost/ Salary	**$ 87,213.3**
RESOURCE COST	**$ 94,190.36**
OVERHEAD COST	**$ 21,803.33**
HARDWARE &SOFTWARE COSTS	**$ 5,809.64**
TOTAL COST OF THE PROJECT	**$ 100,000.00**

Risk Management

Risk Assessment

Risks are uncertainties that can lead to either positive or, mostly, negative effects that can impact the project's objectives. Thus, Project Risk Management is an important aspect for the development of the any project. This is because the practice of project risk management leads into project managers being able to identify the project's strengths, weaknesses, and its opportunities and maximize it to secure a positive outcome.

Top 3 Risks for this Project

1.Data Privacy Violations Leading to Fines – this is when sensitive personal information is accessed or shared by users without permission. This can happen if the personal information about the user stored in the chatbot is discovered and can lead to being fined by regulatory authorities. The company will face fines, lawsuits and can lead to having a bad reputation that will make people less inclined to use its services.

2. Server Failures – this is when the server that is supporting the chatbot in unable to function properly leading to the chatbot having bad performance, sudden downtime, or even server crashes. Reasons that this can happen are due to hardware, software, and network issues or even a server overload when many users are trying to gain access to the server. This can lead to services being disrupted, a loss in data and revenue, and customer dissatisfaction.

3. Project Delays -this is when the project takes longer to complete than originally planned which then affects its timeline, budget, and overall success. This can happen due to changes in the project scopes, its requirements, or objectives, constraints for its resources such as personnel, materials, and equipment, or poor planning that causes the team to encounter unforeseen obstacles. This can lead to additional time needed to complete the project, additional costs, causing to pay employees for overtime, a decrease in stakeholder satisfaction, and a decrease in quality, causing the final result to be released incomplete.

Risk Register

Risk Identification		Qualitative Rating				Risk Response		
Risk	Risk Category	Probability	Impact	Risk Score	Risk Ranking	Risk Response	Trigger	Risk Owner
Data Privacy Violations Leading to Fines	Legal	6	10	60	1	Minimize Risk	Sensitive user data in chatbot is discovered	Pui Chen
Prompt Injections (PI)	Technical	6	8	48	2	Minimize Risk	Malicious input patterns in user interactions are detected	Pranav Chand
Project Delays	Execution	8	6	48	3	Share Risk	Unable to meet milestones, deadlines, or follow the project timeline during the development phase	Aryan Sharma
Server Failures	Technical	6	8	48	4	Minimize Risk	Systems alerts for bad chatbot performance, sudden downtime, or server crashes	Shivam Goundan
Operational Costs	Financial	8	6	48	5	Minimize Risk	Significant Increases in operational expenses when scaling or enhancing the chatbot	Aryan Sharma
Revenue Loss Due to Malfunctions	Financial	6	8	48	6	Minimize Risk	Decreased revenue or sales leading to reduced user engagement or customer satisfaction	Cristiano Ronaldo
Operational Failures Impacting Compliance and Financial Health	Legal	5	8	40	7	Minimize Risk	Non-compliance reports given from regulatory bodies that highlight the operational deficiencies in the system	Lionel Messi
Data Breaches	Technical	4	10	40	8	Transfer Risk	Detection of unauthorized access or data transfer activities within the chatbot system	Shivam Goundan
Security Breaches	Technical	4	10	40	9	Minimize Risk	Attempted or successful unauthorized access is found that leads to exploitation of system	Shivam Goundan
Scope Creep	Execution	5	8	40	10	Minimize Risk	Continuous addition of new features, functions, or changes in project requirements that exceed previously defined scopes	Jay Naidu

Indirect Prompt Injection (IPI)	Technical	6	6	36	11	Minimize Risk	Detection of unexpected behaviours or responses generated by chatbot	Pranav Chand
Lack of Stakeholder Engagement	Execution	6	6	36	12	Accept Risk	Lack of participation or feedback of stakeholders during meetings for chatbot development or deployment	Jay Naidu
Regulatory Changes	Legal	5	7	35	13	Minimize Risk	New laws and regulations that impact the development of the chatbot	Jay Naidu
Scalability Problems	Technical	5	7	35	14	Share Risk	System performance is slowed down with evidence of increased response times or high user traffic	Shivam Goundan
Vendor Dependence	Execution	5	7	35	15	Transfer Risk	Services provided by third-party vendors are changed that negatively impacts the functionality of the chatbot	Pui Chen
Intellectual Property (IP) Infringement	Legal	4	8	32	16	Minimize Risk	Identification of copyrighted materials used within the chatbot system	Lionel Messi
Liability for Misuse	Legal	4	8	32	17	Minimize Risk	Incidents that include the misuse, abuse, or unauthorized access to the chatbot system	Lionel Messi
Liability for Harmful Outputs	Legal	4	8	32	18	Minimize Risk	Chatbot generated output that leads to causing harm, injury, or adverse effects of user or their property	Lionel Messi
Incorrect Outputs from Chatbot	Technical	6	5	30	19	Minimize Risk	Increased frequency of user complaints about inaccurate responses	Pranav Chand
Budget Overruns	Execution	4	7	28	20	Share Risk	Exceeding the budget due to underestimated expenses, scope changes, or unforeseen requirements	Aryan Sharma
Team Conflicts	Execution	5	5	25	21	Minimize Risk	Interpersonal conflicts arise when varying views are put against each other	Aryan Sharma
Maintenance and Updates Failures	Technical	4	6	24	22	Share Risk	Increase in system downtime and service disruptions after software updates, patches, or maintenance	Shivam Goundan

Contractual Disputes	Legal	4	6	24	23	Share Risk	Identification of discrepancies, disagreements, or breach of contracts between project stakeholders, vendors, or third-party service providers	Jay Naidu
Regulatory Compliance Delays	Execution	3	7	21	24	Accept Risk	Failure to meet regulatory deadlines, compliance requirements, or legal obligations due to delays in getting approval for the chatbot system	Aryan Sharma
Inadequate Documentation	Execution	4	4	16	25	Minimize Risk	Missing details about the chatbots design or development that leads to trouble when using reference for troubleshooting or further enhancement	Lionel Messi

Risk Mitigation

Risk	Risk Type	Mitigation Technique
Data Privacy Violations Leading to Fines	Minimize Risk	Encrypt the data both at transit and at rest
Prompt Injections (PI)	Minimize Risk	Implement input validation to ensure users responses are not malicious
Incorrect Outputs from Chatbot	Minimize Risk	Continuously monitor the performance of the chatbot and collect feedback to regularly update the system
Server Failures	Minimize Risk	Deploy multiple servers with load balancing as a backup
Operational Costs	Minimize Risk	Have energy efficient practices like using renewable energy sources where possible
Revenue Loss Due to Malfunctions	Minimize Risk	Perform regular maintenance and monitoring to prevent malfunctions
Operational Failures Impacting Compliance and Financial Health	Minimize Risk	Conduct a thorough risk assessment to identify potential failures
Data Breaches	Transfer Risk	Acquire a third-party cyber security service to manage data security and protect against data breaches
Security Breaches	Minimize Risk	Encrypt data both at transit and at rest
Scope Creep	Minimize Risk	Create contingency plans to allocate resources or the budget to accommodate for unforeseen requirements
Indirect Prompt Injection (IPI)	Minimize Risk	Implement anomaly detection algorithms to detect suspicious patterns when interacting with users
Lack of Stakeholder Engagement	Accept Risk	Accept that some stakeholders will not be interested with the planning
Regulatory Changes	Minimize Risk	Keep up to date with regulatory changes relevant to the company and geography
Scalability Problems	Share Risk	Engage with stakeholders to discuss the scalability requirements and potential growth projections
Vendor Dependence	Transfer Risk	Work with multiple vendors to reduce dependency on a single vendor
Intellectual Property (IP) Infringement	Avoid Risk	Use free open-source software with clear licensing terms to ensure data sources are free from IP restrictions
Liability for Misuse	Minimize Risk	Develop clear and comprehensive terms of use and EULA that outlines the acceptable uses of the project
Liability for Harmful Outputs	Minimize Risk	Continuously monitor the responses and queries from users in real-time
Project Delays	Share Risk	Try to share the resources, like personnel, equipment, and activities, to support a timely project execution
Budget Overruns	Share Risk	Have a transparent budget process that involves relevant stakeholders in the budget making process
Team Conflicts	Minimize Risk	Have team building activities to strengthen interpersonal relationships

Maintenance and Updates Failures	Share Risk	Try to outsource the maintenance and updates to IT experts to ensure no more risks and will occur.
Contractual Disputes	Share Risk	Try to cooperate with contracting parties to come to an acceptable conclusion that benefits all parties
Regulatory Compliance Delays	Accept Risk	Seek legal and regulatory advice to ensure understanding and interpretation of regulatory requirements
Inadequate Documentation	Minimize Risk	Establish clear and concise guidelines that needs to be followed to ensure completeness and accuracy

Project Termination

Project Performance Reports

Expected Reports	Member Responsible	Deadline
Conceptualization Report	Business Analyst	4/7/24
Planning Report	Project Manager	23/8/24
Execution Report	AI Engineer	14/1/25
Termination Report	Project Manager	4/2/25

Project Deliverables Checklist

Delivery Checklist

Deliverables	Checklist
Project Plan	☐
Requirements Document	☐
Stakeholder Analysis	☐
Risk Management Plan	☐
Budget Estimate	☐
Architect Design Document	☐
User Interface Design	☐
Security Plan	☐
Prototype	☐
Codebase	☐
API Documentation	☐
Training Date	☐
Test Plan and Test Cases	☐
User Acceptance Testing	☐
Deployment and Rollback Plan	☐
User and Administrator Guides	☐
Maintenance and Improvement Plan	☐
Performance Monitoring Plan	☐
Progress Report	☐
Final Report	☐

Client Signature: _____ Project Manager Signature: _____

Client Name: _____ Project Manager Name: _____

Date: _____ Company Stamp:

Post-Implementation Audit

Post Implementation Audit	Checklist
The project was completed in the given timeframe	☐
The project was completed in the allocated budget	☐
Tasks were documented	☐
AI-Chatbot tested successfully	☐
Feedback of users taken into consideration for upgrading	☐
Implementation sign-off review has been held	☐
Key Customer Milestone has been achieved	☐
Team has carried out a review of the entire project	☐
Project closure report has been prepared	☐
Stakeholders were satisfied	☐
Copyright for the chat system	☐
Goals and Objectives were completed	☐

Recommendation

To further empower the AI-powered customer service chatbot, consider incorporating several recommended add-ons. Enhance the bot's language understanding with sentiment analysis and multi-language support, enabling tailored responses and broader accessibility. Advanced analytics and reporting tools provide insights into user interactions, improving response accuracy and overall service quality. Integration with CRM systems like Salesforce or HubSpot ensures seamless access to customer data for personalized interactions and efficient issue resolution. Additionally, omni-channel support, including integration with social media platforms and mobile apps, extends the chatbot's reach and provides a consistent user experience across channels. Voice recognition capabilities enhance accessibility and user convenience, while a personalization engine leverages user profiling and AI-driven recommendations for tailored experiences. Security and compliance tools ensure data protection and regulatory adherence, while proactive engagement features, payment system integration, and knowledge base access further enhance the bot's functionality, user engagement, and efficiency. Finally, workflow automation streamlines processes and reduces manual intervention, optimizing overall performance and effectiveness. Integrating these add-ons will elevate your chatbot's capabilities, delivering enhanced user experiences and driving greater customer satisfaction.

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Appendix

Group RAM

Key:

○ Responsible	□ Notification
◊ Support	● Approval

Task	Aryan Sharma *Group Leader*	Jay Naidu	Pui Chen	Pranav Chand	Shivam Goundan
Introduction			○		□ ◊
Project Overview Statement	□	◊			○
Project Charter	○		◊	□ ●	
Work breakdown Structure		●	◊	○	□
Skills Inventory					○
Needs Inventory	□				○
Work Assignment (RAM)	○		□	◊	
Task Duration Estimation		□	○		
Gantt Chart	●	○	□	◊	
Budget			○	●□	◊
Network Diagram		●□	◊	○	
Risk Breakdown	◊□	○			●
Change Management Process	○				□
Change Request Form Template				□	○
Team Charter	□			○	
Project Performance Reports	○	□			
Project Deliverables Checklist		○			
Implementation Checklist		○		□	
Recommendations				○	
Compiling	●			○	

Cost Estimations

Microsoft Azure Estimate

Your Estimate

Service category	Service type	Custom name	Region	Description	Estimated monthly cost	Estimated upfront cost
AI + Machine Learning	Azure AI services		Australia East	Azure AI Language, Pay as you go, Free	$0.00	$0.00
Storage	Storage Accounts		Australia East	Block Blob Storage, General Purpose V2, Flat Namespace, LRS Redundancy, Hot Access Tier, 1,000 GB Capacity - Pay as you go, 250 x 10,000 Write operations, 250 x 10,000 List and Create Container Operations, 250 x 10,000 Read operations, 1,000 x 10,000 Other operations. 1,000 GB Data Retrieval, 1,000 GB Data Write, SFTP disabled	$53.00	$0.00
Databases	Azure SQL Database		Australia East	Single Database, vCore, Business Critical, Provisioned, Standard-series (Gen 5), Primary or Geo replica Disaster Recovery, 1 - 4 vCore instance(s), 1 year reserved, 50 GB Storage, SQL Licence (AHB), RA-GRS Back up Storage Redundancy, 10 GB Point-In-Time Restore, 0 x 6 GB Long Term Retention	$709.56	$0.00
Networking	VPN Gateway		East US	VPN Gateways, Basic VPN tier, 249 gateway hours, 10 S2S tunnels, 128 P2S connections, 50 GB, Inter-VNET outbound VPN gateway type	$10.71	$0.00
Analytics	Azure AI Bot Service		Australia East	Free Tier	$0.00	$0.00

Integration	Service Bus	East US	Basic tier: 250 million messaging operations	$12.50	$0.00
Compute	Virtual Machines	Australia East	1 NC8as T4 v3 (8 vCPUs, 56 GB RAM) x 1 Month (Pay as you go), Linux, (Pay as you go); 0 managed disks – S4; Inter-region transfer type, 5 GB outbound data transfer from Australia East to East Asia	$713.94	$0.00
Support		Support		$0.00	$0.00
		Licensing Program	Microsoft Customer Agreement (MCA)		
		Billing Account			
		Billing Profile			
		Total		1499.714USD	$0.00
				3400.82FJD	

Disclaimer

All prices shown are in United States – Dollar ($) USD. This is a summary estimate, not a quote. For up to date pricing information please visit https://azure.microsoft.com/pricing/calculator/
This estimate was created at 5/26/2024 12:29:21 AM UTC.

Role	Hours	Percent Work	Total Compensation	Hourly Rate	References
Fullstack	620	0.19821	12939.4	20.87	https://frcs.org.fj/work-with-us/software-developer-vacancy-10-2022-it-support-engineer-vacancy-11-2022/
Business Analyst	384	0.122762	5445.12	14.18	https://waterauthority.com.fj/wp-content/uploads/2023/01/REF-1102-Business-Analyst-National-Office.pdf
Customer Specialist	48	0.015345	415.2	8.65	https://waterauthority.com.fj/wp-content/uploads/2023/08/REF-1224-Customer-Experience-Officer-Lautoka-CS-Office.pdf
System Architect	388	0.124041	7461.24	19.23	https://www.frcs.org.fj/wp-content/uploads/2022/10/Position-Description-Systems-Engineer.pdf
QA	640	0.204604	10464	16.35	https://frcs.org.fj/work-with-us/employment-opportunity-senior-accountant-senior-internal-auditor-compliance-and-operational-coordinator-quality-assurance-officer-information-liaison-officer-it-support-engineer/
AI	600	0.191816	18738	31.23	https://ph.indeed.com/career/machine-learning-engineer/salaries
PM	448	0.143223	10769.92	24.04	https://www.finance.gov.fj/wp-content/uploads/2024/02/Vacancy-25-of-2024-Project-Manager-PPP-Affordable-Housing-Project.pdf
	3128	66232.88			

After having discussed as team, we recommend the following mark allocation to each team member based on contribution or lack of it throughout the assignment.

Member ID	Percentage of assignment 1 marks	Task Completed
S11209162	100%	ALL
S11211264	100%.	ALL
S11210082	100%.	ALL
S11208298	100%.	ALL
S11171153	100%.	ALL

Signed

Member name	ID	Signature
Rui Chen	S11209162	
JAY NAIDU	S11211264	
Aryan Sharma	S11210082	
Shivam Goundan	S11208298	
PRANAV CHAND	S11171153	