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IS 350 – Project Management

Title: Optimizing the Ajrah Application

Group 1

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1.Introduction:

The Ajrah Taxi App is a popular platform that has been specifically developed to provide effective and convenient taxi services to users. With the growing demand for on-demand services, Ajrah has been playing a crucial role in linking drivers with riders seamlessly. However, like most other applications in this competitive situation, there are certain challenges and limitations that hinder the overall user experience and service effectiveness.

This project is dealing with the finding of key issues that riders as well as drivers both face in the Ajrah platform and applying the solution for improving its effectiveness. In consideration of making the application more intuitive and efficient, improving both service providers' as well as users' experience is the goal.

2. Problem Statement:

Issues with the Current Application The Ajrah Taxi Application has several challenges that affect its overall performance and user experience:

1. Slow Response in Chatbot: The chatbot's response time is slow, and it has limited, fixed choices that reduce its flexibility and user interaction.
2. Language Conversion Issues: When switching languages, the app doesn't fully convert the content, leading to inconsistent user experiences.
3. Limited Scope of Service: The application's coverage and service availability are restricted, limiting the range of areas users can access.
4. Language Preference Not Saved: The app fails to save the user's language choice, so when switching between languages, users need to re-select it.
5. Inaccurate Location Detection: The app sometimes fails to correctly identify the customer's location, causing delays and frustration for users.
6. Language Support Limitations: Currently, the app only supports English and Arabic, limiting access for users who speak other languages.
7. Confirmation Code Issues: Some users encounter errors stating that the confirmation code is incorrect during login or sign-up.
8. Email Validation Missing: The app does not check the validity of email addresses during user registration or sign-up.
9. Slow Response Time: The overall response time of the app is slow, which affects the user experience, especially when booking rides.
10. Lack of Integration with Riyadh Metro Network: The app is not integrated with the Riyadh Metro network, limiting its ability to offer more seamless and efficient travel options.

3. Methodology:

3.1 Approach to Optimizing the Ajrah Application:

To optimize the Ajrah Taxi Application, we used a user-centered and performance-driven approach that focuses on improving system responsiveness, the coverage of the system, and security while improving overall experience for the user.

1. Improving System Efficiency and Performance:

- Improving the backend infrastructure of the app to be able to handle high traffic, ensure a faster response time.
- Improve the chatbot to process the user queries more dynamically, reducing delays and making the interaction better .
- Optimizing GPS accuracy by integrating advanced location APIs, allow for more precise location tracking and reducing navigation errors
- Implement a real time processing enhancement for booking, paying, and tracking to reduce the latency .

2. Expanding Accessibility and user Convince:

- Expanding the service areas by integrating location based demand analysis to ensure the Ajrah services reach more users.
- Introducing persistent user preferences, allow languages selection to be saved • Multi language support to improve the consumer experience.

3.Strengthening Security And Reliability:

- Improving the data validation to ensure more accurate email verification and reduce the errors in the login process .
- Enhances data encryption and storage security to ensure all transactions and consumers information remain protected.
- Strengthen integration with external transport networks , particularly the Riyadh Metro to provide a holistic mobility solution.

3.2 Tools and Techniques Used:

1.Programming Frameworks:

- Flutter: used for mobile development on IOS and Android.
- Node.js / Django: for backend development because they are efficient in real time requests.

2.Database Management:

- Fire base: enable real-time data synchronization and cloud storage.
- MySQL: used for structured and reliable data storage.

3.User Experience Enhancement:

- Improve chatbot.
- Redesign UI for seamless language switching.

4.Performance Optimization and Analytics:

- Google Analytics: monitoring user behavior and app engagement to guide improvement.
- Firebase performance Monitoring: analyze backend response time to optimize speed.

5.Integration with External Services:

- Google Maps: enhance the GPS accuracy.
- Riyadh Metro: Facilitate seamless integration with the public transit network.

6.Security and Authentication:

- SSL Encryption: to ensure data protection .
- Email validation System: reduce errors in the login process.

3.3 SDLC model :

The Ajrah Taxi App Improvement Project follows an Incremental SDLC model with a User-Centered Design approach. The project is broken down into several phases, each addressing key issues such as chatbot responsiveness, GPS accuracy, and language support. By delivering the app in increments, we ensure that each phase builds on the previous one, allowing for continuous feedback, early testing, and gradual enhancement of functionality and user experience.

3. Project Charter:

PROJECT CHARTER	
Project Title: <u>Ajrah Taxi App Optimization for Enhanced User Experience</u>	
Project Sponsor: <u>Saeed Al-Rashid</u> Date Prepared: <u>March 12, 2025</u>	
Project Manager: <u>Ahmed Al-Fahad</u> Project Customer: <u>Ajrah Taxi App Users (Drivers and Riders)</u>	
Project Purpose: <div>The purpose of this project is to resolve key issues affecting the performance and user experience of the Ajrah Taxi App, focusing on speed, accuracy, and service expansion. The goal is to enhance user satisfaction and streamline integration with the Riyadh Metro network.</div>	
High-Level Project Description: <div>This project aims to optimize the Ajrah Taxi App by enhancing chatbot responsiveness, fixing language conversion for Arabic and English, expanding service areas, and saving language preferences. It also focuses on improving GPS accuracy, resolving login and registration issues, optimizing backend performance, and integrating with the Riyadh Metro network. Security features will be implemented to ensure data protection.</div>	
Project Boundaries:	
In-Scope: <ul style="list-style-type: none">1) Development of the chatbot, GPS, and payment systems.2) Integration with Riyadh Metro for seamless travel options.3) Support for multiple languages and efficient language conversion.4) Development of both iOS and Android versions of the app.5) Implementation of security features for data protection.	Out-of-Scope: <ul style="list-style-type: none">1) Development of web-based versions of the app (only mobile versions included).2) Integration with international transport networks outside Saudi Arabia.3) Advanced analytics and reporting features (future phase).
Key Deliverables: <div><ul style="list-style-type: none">1) An improved and responsive chatbot.2) Accurate language conversion system for Arabic and English.3) Expanded service coverage and improved GPS accuracy.4) Fixed login and registration errors, including confirmation code and email validation.5) Optimized backend for faster performance.6) Seamless integration with the Riyadh Metro network.</div>	
High-Level Requirements:	
Functional Requirements: <ul style="list-style-type: none">Real-time booking and tracking of taxis.Accurate and reliable navigation for drivers.Multilingual interface supporting Arabic and English.Secure login and payment processes.	Non-Functional Requirements: <ul style="list-style-type: none">High performance with low response times for all app features.Compliance with local regulations and security standards.Scalable architecture to handle a large number of users.User-friendly design for easy navigation and use

PROJECT CHARTER

Project Objectives	Success Criteria
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Scope:

Enhance chatbot, fix language conversion, expand service area, improve GPS accuracy, add language support, integrate with Riyadh Metro.	Improved chatbot flexibility, seamless language conversion, wider service coverage, precise GPS location, additional language options, successful Riyadh Metro integration. Users experience a more responsive chatbot, accurate language conversion, expanded geographic service, improved GPS accuracy, additional language options, and seamless metro integration.
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Time:

Complete all planned improvements within six months (April 1, 2025 – September 30, 2025)	Each milestone is achieved within its designated timeframe, with full deployment completed by the end of month six or earlier, without major delays.
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Cost:

Optimize development and integration within budget constraints.	Project completion within the approved budget, ensuring all enhancements are delivered without cost overruns.
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Other:

Improve overall app usability and efficiency.	Enhanced backend optimization, smoother user experience, and increased accessibility for diverse users.
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Summary Milestones	Due Date
Requirements gathering	April 15, 2025
Design and planning	June 1, 2025
Development phase 1	July 15, 2025
Testing and QA	August 15, 2025
Development phase 2	August 30, 2025
Final testing & deployment	September 30, 2025

PROJECT CHARTER

Stakeholder(s)	Role
Project Owner	Define project goal, set priority, and communicate with stakeholders
Sponsor	Provide funding and overall support for project
Project Manager	Handles planning, oversight, and ensure smooth execution
Development Team	Designs, develops, and enhances the app's features
Taxi Drivers	Provide transportation services through the app
User (Passengers)	Use the app for transport and provide feedback on their experience.

Project Manager Authority Level: The Project Manager has high-level authority over project execution, feature development, and quality improvements. However, approval from the Sponsor is required for budget changes, major scope modifications, or significant project milestones.

Staffing Decisions: The development team will handle improvements, with feedback guiding updates from the Project Manager. Additional developers may assist with optimization and testing if needed, with approval from the Project Manager for resource allocation and the Sponsor for budget impact.

Budget Management and Variance: A set of budget covers feature improvements and testing. The project manager will track expenses and adjust for any deviations to maintain financial control.

Conflict Resolution: The team will be addressed in a weekly meeting. Technical issues will go to the development team, and major problem will be discussed with stakeholders to find solutions and keep the project on track.

PROJECT CHARTER

Sponsor Authority: The project sponsor holds the primary responsibility for overseeing the Ajrah Taxi App Optimization project. Their authority includes providing financial oversight, ensuring the project remains within budget, and approving any necessary adjustments. Additionally, the sponsor offers strategic guidance to align the project with the company's broader objectives. They play a crucial role in decision-making, particularly for major changes, scope modifications, and key project milestones. In case of risks or challenges, the sponsor is responsible for evaluating mitigation strategies and making final determinations. Furthermore, they serve as a key point of communication with executives and other stakeholders to ensure transparency and alignment throughout the project lifecycle.

Approval: The approval process ensures that all key project decisions and deliverables are formally validated by the necessary authorities. The project manager and the sponsor must provide their signatures to confirm agreement on the project's scope, objectives, and implementation strategy. This step signifies official authorization to proceed and acknowledges accountability for project success.

Project Manager Signature: *Ahmed Al-Fahad*

Sponsor or Originator Signature: *Saeed A-Rashid*

Project Manager Name: Ahmed Al-Fahad

Sponsor or Originator Name: Saeed Al-Rashid

Date: March 12, 2025

Date: March 12, 2025

5. Techniques for Collecting Requirements with Justification

As shown in Table 1, several techniques can be used to collect requirements effectively, each with specific strengths based on context and objectives.

Table 1: Techniques for Collecting Requirements

Technique	Description	Justification
1. Surveys and Questionnaires	Distributed to active users of the Ajrah app to gather insights on functionality, language preferences, and common issues.	Efficient way to collect data from a large user base quickly and cost-effectively.
2. Interviews	Conducted with frequent users and Ajrah drivers to gather qualitative feedback on app usage and pain points.	Helps uncover detailed user concerns and expectations that may not appear in surveys.
3. Observation	Monitoring users interacting with the current app to identify usability issues and delays in navigation or response.	Reveals real-time behavioral patterns and technical flaws not expressed by users.
4. Document Analysis	Reviewing existing documentation, user reviews, app store feedback, and system reports.	Allows identifying recurring issues and system gaps already acknowledged by users.
5. Prototyping	Low-fidelity prototypes were created and presented to users for early feedback.	Encourages users to visualize changes and offer practical suggestions before development begins.

6.Project Requirements:

The Ajrah Taxi App is designed to provide a seamless and user-friendly experience for booking rides, integrating real-time location tracking, dynamic language support, and chatbot interactions. It aims to expand service coverage based on demand, offer integration with the Riyadh Metro, and ensure security, scalability, and high performance.

6.1 Functional Requirements:

These describe Ajrah Taxi App must do:

1.User Login & Registration

- Users must be able to sign up using email or phone.
- The app must validate email addresses during registration.
- Secure login and payment processes must be ensured.

2. Language Settings

- Users can select and save preferred language.
- The app must support dynamic switching between languages (e.g., English, Arabic, and others).
- Multilingual interface supporting Arabic and English.

3. Ride Booking

- Users can book rides in real time based on location.
- App must suggest nearby available drivers.
- Real-time booking and tracking of taxis.

4.Chatbot Interaction

- Chatbot should respond dynamically and process custom user inputs, not just fixed replies.

5. Real-Time Location Tracking

- App should detect user location accurately and display it to the driver.
- Accurate and reliable navigation for drivers.

6.Service Area Expansion

- The app must provide services beyond current restricted zones using demand-based logic.

7.Integration with Metro Network

- App must include routing and suggestions for Riyadh Metro when applicable.

6.2 Non-Functional Requirements:

These specify **how** the system performs:

1. Performance

- App response time must be under 2 seconds for all key actions (login, booking, etc.).
- High performance with low response times for all app features.

2. Usability

- App should provide a clean UI with clear buttons and support intuitive navigation in both languages.
- User-friendly design for easy navigation and use.

3. Scalability

- Backend must handle increased user load (10,000+ concurrent users).
- Scalable architecture to handle a large number of users.

4. Security

- All user data should be encrypted using SSL.
- Email verification must be enforced.
- Compliance with local regulations and security standards.

5. Compatibility

- App must be functional on both Android and iOS platforms.

6. Availability

- App uptime must be at least 99.5%.

6.3 Software Requirements:

- **Mobile Development Framework:** Flutter (for cross-platform development)
- **Backend Framework:** Node.js or Django (based on real-time performance needs)
- **Database:**
 - Firebase (real-time data sync)
 - MySQL (structured data storage)
- **APIs:**
 - Google Maps API (location and routing)
 - Riyadh Metro API (public transport integration)
- **Analytics & Monitoring:**
 - Google Analytics
 - Firebase Performance Monitoring

6.4 Hardware Requirements:

For Development Team:

- Laptops or desktops with:
 - 16 GB RAM minimum
 - i7 processor or Apple M1 equivalent
 - SSD (256 GB+)

For Server Hosting:

- Cloud-based server (AWS, Firebase, or GCP)
 - 8-core CPU
 - 32 GB RAM
 - 500 GB SSD
 - High-speed network support

1. Scope Statement:

PROJECT SCOPE STATEMENT

Project Title: Ajrah Taxi App Optimization for Date Prepared: March 12, 2025

Enhance User Experience

Project Scope Description:

The project aims to enhance the Ajrah Taxi App's user experience by addressing critical challenges such as slow chatbot response, language conversion issues, inaccurate location detection, and service area expansion. This includes performance optimization, multilingual support, integration with the Riyadh Metro network, and security enhancements.

Project Deliverables:

1. Enhanced Chatbot: Faster response times and dynamic query processing.
2. Language Conversion System: Seamless Arabic-English switching with saved preferences.
3. Improved GPS Accuracy: Integration of advanced location APIs (e.g., Google Maps).
4. Expanded Service Coverage: Demand-based analysis to extend service areas.
5. Riyadh Metro Integration: Seamless route suggestions combining taxis and metro.
6. Login/Registration Fixes: Resolved confirmation code errors and email validation.
7. Optimized Backend: Reduced latency (<2 seconds response time).
8. Updated Mobile Apps: Compatible with Android and iOS latest versions.

Product Acceptance Criteria:

1. Chatbot responds within 2 seconds and supports dynamic user queries.
2. Language conversion works flawlessly with preferences saved automatically.
3. GPS accuracy within a 10-meter range using Google Maps.
4. Service coverage expanded to 90% of Riyadh's requested areas.
5. Successful integration with Riyadh Metro (e.g., "Integrated Suggestions" feature).
6. All login/registration errors (confirmation codes, email validation) resolved.
7. App response time < 2 seconds for all core functions (booking, payment, tracking).
8. Compatibility with latest OS versions (Android 14+, iOS 18+).

Project Exclusions:

1. Development of a web-based app version (mobile-only focus).
2. Integration with international transport networks outside Saudi Arabia.
3. Advanced analytics/reporting features (deferred to future phases).
4. Additional language support beyond Arabic and English (e.g., French, Chinese).

PROJECT SCOPE STATEMENT

Project Constraints

1. **Time:** Must be completed within 6 months (April 1, 2025 – September 30, 2025).
2. **Budget:** Total costs capped at \$87,000 (includes development, testing, deployment).
3. **Resources:** Reliance on a 6-member development team with limited public transport integration experience.
4. **Technology:** Mandatory use of Flutter, Node.js/Django for backend compatibility.

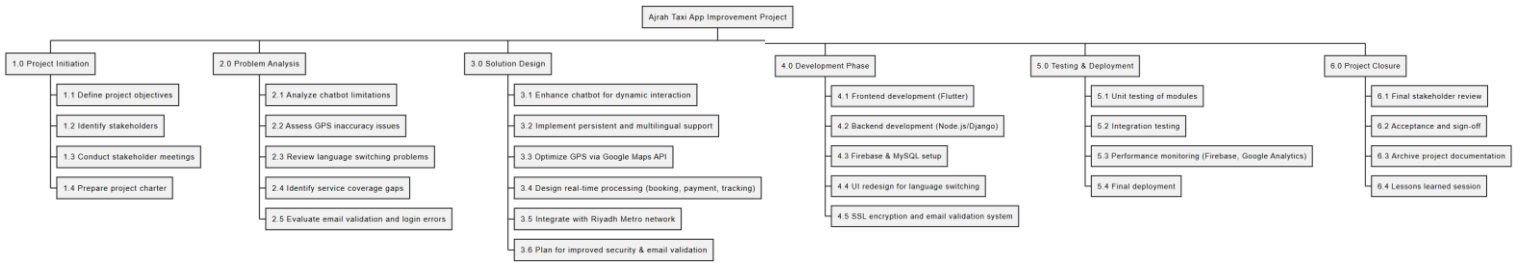
Project Assumptions

1. Availability of Riyadh Metro APIs for integration.
2. Stable Firebase and Google Cloud server infrastructure.
3. Continuous feedback from app users (drivers and riders).
4. No major policy changes in public transport during the project timeline.

8.Work Break Down Structure (WBS – WBS Dictionary):

8.1 WBS:

Figure 1: WBS



8.2 WBS Dictionary:

Table 2: WBS Dictionary

WBS code	Work Description	Activities	Cost Estimate(\$)	Acceptance Criteria	Responsible Manager
1.0	Project Initiation	Define objectives, meet stakeholders, prepare charter	5,000	Objectives clearly defined, stakeholders signed off on charter	Project Owner / Project Manager
2.0	Problem Analysis	Gather user feedback, identify technical issues (chatbot, GPS, etc.)	7,000	Problems well documented and validated by team	User (Passengers) / Taxi Drivers (feedback) + Project Manager
3.0	Solution Design	Design dynamic chatbot, multilingual support, metro integration	10,000	Design documents approved by stakeholders	Development Team
4.0	Development phase	Implement features using Flutter, Node.js/Django, Firebase	50,000	Code reviewed, merged, and passes integration tests	Development Team
4.1	Frontend Development	Develop UI with Flutter	15,000	UI matches approved design and is fully functional	Development Team
4.2	Backend Development	Set up backend with Node.js or Django	20,000	APIs functional and secure	Development Team
4.3	Firebase Integration	Implement Firebase and real-time sync	5,000	Firebase properly integrated and real-time works	Development Team
5.0	Testing &Deployment	Unit testing, performance testing, deployment	12,000	App passes all QA checks and is deployed	Development Team + Project Manager
6.0	Project Closure	Final meeting, sign-off, documentation archive	3,000	All documentation complete and accepted by client	Project Owner / Sponsor

9. RACI Chart:

Table 3: RACI Chart

Task	P M	B A	S A	Fronten d Lead	Backen d Lead	Clou d Dev Lead	QA/DevOp s	Stakeholde r
1.0 Project Initiation	A	C	C	I	I	I	I	I
1.1 Define Objectives	A	R	C	I	I	I	I	I
1.2 Identify Stakeholders	R	A	C	I	I	I	I	C
1.3 Conduct Stakeholder Meetings	R	A	C	I	I	I	I	C
1.4 Prepare Project Charter	A	R	C	I	I	I	I	C
2.0 Problem Analysis	C	A	C	I	I	I	I	I
2.1 Analyze Chatbot Issues	C	A	C	I	I	I	I	I
2.2 Assess GPS Inaccuracy	C	A	C	I	I	I	I	I
2.3 Review Language Switching	C	A	C	I	I	I	I	I
2.4 Identify Service Gaps	C	A	C	I	I	I	I	I
2.5 Evaluate Login/Email Errors	C	A	C	I	I	I	I	I
3.0 Solution Design	C	C	A	C	C	C	C	I
3.1 Enhance Chatbot	C	C	A	C	C	C	C	I
3.2 Multilingual Support	C	C	A	R	C	C	C	I
3.3 Optimize GPS (Google Maps API)	C	C	A	C	R	C	C	I
3.4 Real-time Booking/Payment	C	C	A	C	R	C	C	I

3.5 Riyadh Metro Integration	C	C	A	C	R	R	C	I
3.6 Security & Email Validation	C	C	A	C	C	R	R	I
4.0 Development Phase	A	C	C	R	R	R	C	I
4.1 Frontend (Flutter)	C	C	C	A	I	I	C	I
4.2 Backend (Node.js/Django)	C	C	C	I	A	I	C	I
4.3 Firebase/MySQL Setup	C	C	C	I	I	A	C	I
4.4 UI Redesign (Language Switching)	C	C	C	A	I	I	C	I
4.5 SSL/Email Validation	C	C	C	I	I	A	R	I
5.0 Testing & Deployment	A	C	C	C	C	C	R	I
5.1 Unit Testing	C	C	C	R	R	R	A	I
5.2 Integration Testing	C	C	C	R	R	R	A	I
5.3 Performance Monitoring	C	C	C	C	C	R	A	I
5.4 Final Deployment	A	C	C	C	C	C	R	C
6.0 Project Closure	A	C	C	C	C	C	C	R
6.1 Final Stakeholder Review	A	C	C	C	C	C	C	R
6.2 Acceptance & Sign-off	A	C	C	C	C	C	C	R
6.3 Archive Documentation	R	C	C	C	C	C	C	I
6.4 Lessons Learned	A	R	C	C	C	C	C	I

Roles in the RACI Chart:

- A = Accountable:

The person who is ultimately responsible for the completion of the task. This individual makes final decisions and oversees the work.

- R = Responsible:

The person who actually performs the work to complete the task. There can be more than one person in this category if the task requires collaboration.

- C = Consulted:

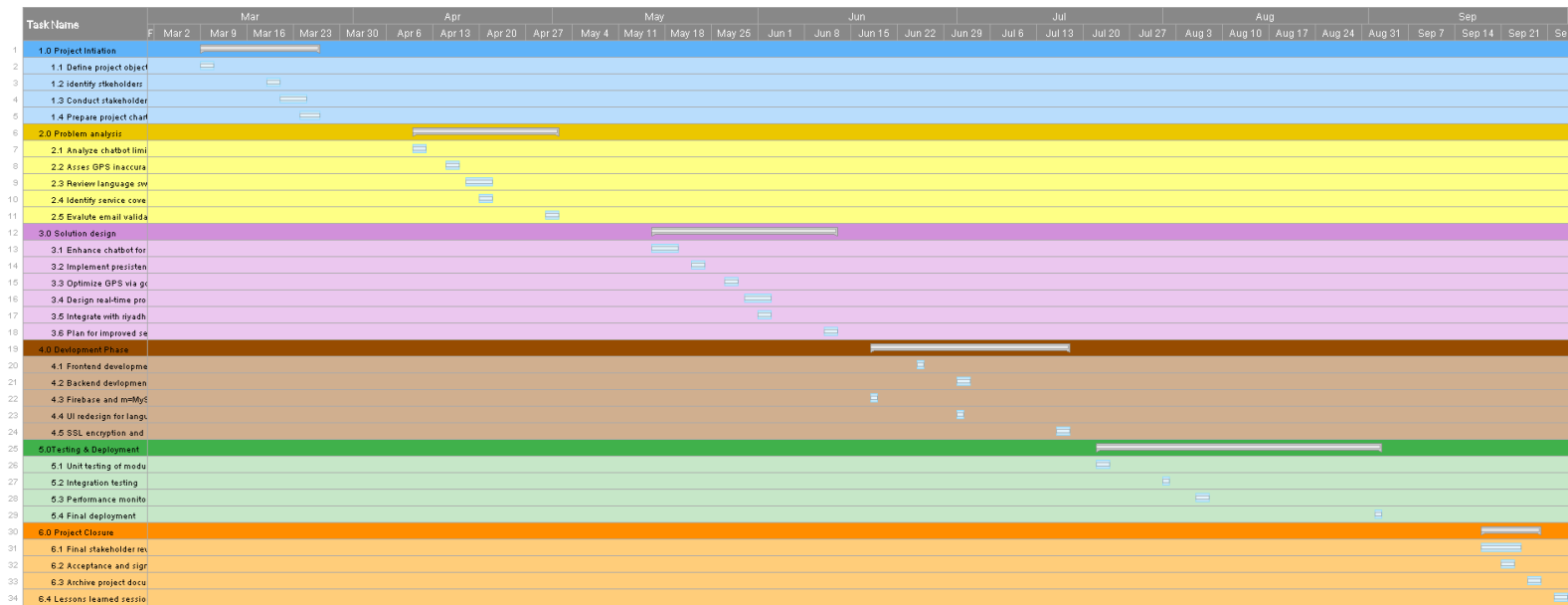
These individuals are consulted during the task execution due to their expertise or specialized knowledge. They are contacted for their input or advice.

- I = Informed:

These individuals need to be kept informed of the project's progress or task results, but they don't need to be involved in decision-making or execution.

10. Gantt Chart:

Figure 2: Gantt Chart



The Gantt chart summarizes the full project timeline for Ajrah App Optimization. Tasks are color-coded by phase and arranged sequentially. Since the project is complete, all tasks are marked as “Completed” and 100% done.

11. Risk Register

Table 4: Risk Register

ID	Risk Description	Risk Category	Risk strategy
1	There is a risk that optimizing the chatbot's backend could lead to unexpected bugs or system failures, causing even more delays in response time.	(Negative)	Risk Mitigation
2	There is a risk that efforts to standardize language translation may fail to address all language discrepancies, leading to incomplete or incorrect translations during app use.	(Negative)	Risk Mitigation
3	Adding new language options may lead to unexpected demand from international users, potentially causing operational challenges but also offering a significant opportunity for global market expansion and increased user acquisition.	(Positive)	Risk Enhancement

12.Referncess:

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