

AXIOM SPHERE-Hub of Complete Solutions
Minor Project Report

SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR
THE AWARD OF THE DEGREE OF

BACHELOR OF TECHNOLOGY
Computer Science Engineering



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CERTIFICATE

This is to certify that the minor project work entitled “Axiom Sphere” submitted by Esikela Venkata Sai Saran (2020BTechCSE106) towards the partial fulfillment of the requirements for the degree of Bachelor of Technology in Computer Science Engineering of JK Lakshmipat University Jaipur is the record of work carried out by them under my supervision and guidance. In my opinion, the submitted work has reached a level required for being accepted for minor project examination.

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ABSTRACT

Our project, Axiom Sphere app, is like a magic toolbox for anyone working on different kinds of projects. Whether you're building something, planning an event, or setting up a software company, this app makes it easy to find and get what you need. It's like having a helpful friend who knows all the best places to get stuff. With the app, you can explore different things you might need, like building materials or event services. Everything is sorted neatly so you can quickly find what fits your project. Plus, if you're not sure what you need, the app can suggest things based on what you've liked before and what others have found useful. The best part is that the app connects people who need things with people who have things to offer. So, if you're a customer, you can see what's available, book it in the app, and even check out how other customers rated it. If you're a provider, you can showcase what you offer and easily reach new customers. The app is like a double-sided coin. It works for both people who need stuff and people who have stuff to share. So, no matter what your role is, you can use the app to make your projects smoother and more successful. It's like having a super helpful tool in your pocket for whatever you're working on.

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"Last but not least, I would like to express my heartfelt gratitude to my family and friends for their unwavering support, encouragement, and understanding throughout this journey. Their collective support has been a source of motivation and inspiration, and I am truly thankful for the role they have played in the successful completion of this project.

Sincerely yours,

Esikela Venkata Sai Saran

(2020BTechCSE106)

LIST OF FIGURES

Fig. No.	Figure Description	Page. No.
Figure 1	Level zero DFD	10
Figure 2	: Level 1 DFD	11
Figure 3:	Use Case Diagram	11
Figure 4:	Sequence diagram	12
Figure 5:	Flow Chart of Provider	12
Figure 6:	Flow Chart of Customer	13
Figure 7:	Tabular information of Interface Design	13
Figure 8:	Tabular Information of Database Design	14
Figure 9:	Axiom Sphere Methodology	16
Figure 10	Schedule PERT chart	18
Figure 11:	Splash And Mobile Login	23
Figure 12:	User Selection	23
Figure 13:	Provider Form	23
Figure 14:	By Clicking customer	24
Figure 15:	Construction of Building	24
Figure 16:	Hosting a Hackathon	24
Figure 17:	By clicking event Management	24
Figure 18 :	Under event management	24
Figure 19:	Cater Shops	24
Figure 20 :	Firestore Database	25
Figure 21:	Authentication	25
Figure 22:	Analytics	25

TABLE OF CONTENTS

Contents	Page No.
<i>Certificate</i>	<i>ii</i>
<i>Abstract</i>	<i>iii</i>
<i>Acknowledgement</i>	<i>iv</i>
<i>List Of Figures</i>	<i>v</i>
<i>Table of Contents</i>	<i>vi</i>
Chapter 1: Introduction	1
1.1 Project category	1
1.2 Objectives	2
1.3 Problem Statement	3
1.4 Identification/Reorganization of Need	3
1.5 Existing System	3
1.6 Proposed System	4
1.7 Unique Features of The System	4
Chapter 2: Requirement Analysis and System Specification	5
2.1 Feasibility Study	6
2.2 Software Requirement Specification	6
2.3 Validation	7
2.4 SDLC Model	8
2.5 Expected Hurdles For Axiom Sphere Project	8
Chapter 3: System Design	10

3.1 Design Approach	10
3.2 Data Flow Diagrams	10
3.3 Database Manipulation	14
3.4 Methodology	16
Chapter 4: Implementation, Testing, And Maintenances	18
4.1 The Schedule	18
4.2. Software Testing	19
Chapter 5: Results And Discussion	21
5.1 User Interface Representation	21
5.2 Back Ends Representation	25
Chapter 6: Conclusion And Future Scope	26
6.1 Conclusion	26
6.2 Future Scope	27
References	28

CHAPTER-1 INTRODUCTION

Axiom Sphere is all about saving you time and effort. Instead of searching all over the place for materials or services, the app brings everything together in one spot. With just a few taps, you can find what you're looking for, making the whole process quick and simple. It's like having a super handy tool that helps you explore, choose, and get the right stuff for your projects. The app is designed to be easy for everyone to use, even if you're not a tech expert. Everything is organized neatly, and you can see details about each item or service. Plus, Axiom Sphere can suggest things based on what you've liked before and what others have found useful, making it even easier for you to decide.

Axiom Sphere is like a friendly connector between people who need things and people who have things to offer. If you're looking for something, you can see what's available, book it in the app, and even check out how other people rated it. On the flip side, if you're offering something, you can showcase it in the app and reach new customers. It's a win-win for everyone involved. Booking and rating things in Axiom Sphere is super handy. If you need something, you can book it right there in the app without any extra steps. And the best part? You can read what other people think about it. Their ratings and reviews help you know if it's the right choice for your project. This makes the whole process smoother and more reliable.

Axiom Sphere isn't just for people who need things; it's also great for people offering things. If you have something to share, you can easily add it to the app. This way, you can connect with more people and grow your business. Axiom Sphere is like a friendly hub where everyone helps each other out. It's not just an app; it's your project's best buddy, making everything simpler and more successful.

In essence, Axiom Sphere is your go-to companion for project success. Whether you're a builder, event planner, or software developer, the app is designed to make your life easier. As we explore Axiom Sphere further, it's a game-changer in how we manage projects. With its straightforward approach and user-friendly features, Axiom Sphere becomes a trusted ally, guiding you through the intricacies of project execution. As we delve deeper into the world of Axiom Sphere, it becomes clear that this app is not just about transactions; it's about building a community of collaboration. By connecting providers and customers in a seamless ecosystem, Axiom Sphere fosters a sense of shared success. It adapts to your needs, whether you're on the lookout for resources or eager to share your offerings with a broader audience. Axiom Sphere is not merely an app; it's a dynamic sphere of possibilities, where everyone plays a part in making projects more efficient, transparent, and, ultimately, triumphant.

1.1 Project Category

The project primarily involves the development of a cross-platform mobile application.

➤ **Technology Stack**

- Utilizes Flutter framework for cross-platform compatibility.
- Dart programming language for front-end development.
- Firebase for backend services, real-time database, and authentication.

➤ **Platform Independence**

- Focuses on creating an application that seamlessly operates on both Android and Website platforms.

➤ **User Interface Design**

- Emphasizes the development of a user-friendly interface, adhering to Flutter's widget-

based architecture.

➤ **Development Environment**

- Relies on Visual Studio as the primary integrated development environment (IDE) for coding and debugging.

➤ **Community Support and Plugins**

- Leverages the Flutter community for support, shared insights, and integration of relevant plugins.

➤ **Industry Application**

- Tailored to cater to diverse industries such as construction, event management, Hosting The Hackathon and software development.

1.2 Objectives:

➤ **Streamline Procurement:**

- Simplify the process of acquiring resources and services for various projects.
- Provide users with a central platform to efficiently explore and select the necessary materials.

➤ **User-Centric Experience:**

- Design an intuitive and user-friendly interface accessible to individuals of all technical backgrounds.
- Tailor the app to individual preferences, making project management accessible to a broad audience.

➤ **Smart Recommendation System:**

- Implement advanced algorithms to suggest personalized options based on user history and preferences.
- Enhance user decision-making by leveraging collective insights from the community.

➤ **Connect Providers and Customers:**

- Serve as a dynamic connector between resource/service providers and customers.
- Facilitate transparent communication and collaboration, allowing providers to showcase their offerings.

➤ **Booking and Rating Functionality:**

- Enable users to book resources or services directly through the app, minimizing intermediary steps.
- Implement a robust rating system to empower users to share experiences, fostering transparency and accountability.

➤ **Dual Functionality for Providers:**

- Provide a platform where both customers and providers can actively participate.
- Allow providers to showcase their offerings, expanding their reach and clientele.

➤ **Versatility Across Industries:**

- Ensure the application's applicability across diverse industries, including construction, event management, software development, and more.
- Address the unique needs of each industry, fostering a versatile and adaptable platform.

➤ **Community Building:**

- Cultivate a vibrant community where users actively contribute to the success of others.
- Encourage collaboration and mutual support between providers and customers within the app.

➤ **Enhance Project Success:**

- Act as a dependable companion for users embarking on projects, guiding them through the entire lifecycle.
- Strive to contribute to increased project success by providing a comprehensive and efficient tool.

1.3 Problem Statement

Sometimes, when people are working on projects like Construction Of building or planning events, it's hard for them to find and get the right materials or services they need. The ways they usually do this can be confusing, not easy to use, and might not connect the people who have what's needed with the people who need it.

Existing apps or methods might not work well for everyone, especially those who aren't experts in technology. This creates a problem because it takes more time to find the right stuff, and sometimes it's not even clear if it's the best choice.

Also, businesses that provide materials or services might struggle to reach more customers, and people doing projects might find it hard to connect with these providers. This can slow down projects, make them more complicated, and even affect their quality.

So, there's a need for a solution - a simple and easy-to-use app that works on both Android and Web Application , making it easy for everyone to find the right things for their projects. This app should connect people who need things with those who have things to offer, making the whole process smoother and helping everyone involved. Axiom Sphere aims to make getting resources and services straightforward, eliminating confusion and making your project journey smoother. By Addresses the problem of inefficiency, lack of transparency, and accessibility in the procurement process for project resources. Aims to connect resource/service providers with customers, fostering collaboration within a dynamic project ecosystem.

1.4 Identification/Reorganization of Need

The Axiom Sphere project is driven by a keen understanding of the prevalent challenges in existing project management practices. Recognizing the fragmented nature of current procurement processes, where essential resources are scattered across multiple platforms, the need for a centralized solution became evident. Additionally, the limited connectivity between resource providers and project managers posed a barrier to effective collaboration. The identified need for enhanced connectivity underlines the necessity for a platform that facilitates seamless communication and collaboration. Addressing the complexities of existing platforms, which may lack user-friendly interfaces, the project aims to provide a solution that is accessible to users with varying levels of technical expertise. Transparency and trust issues arising from the lack of visibility into the procurement process further emphasize the demand for a platform that fosters transparency, enabling users to make informed decisions and build trust. Inefficient booking and rating systems add to the challenges, prompting the development of a streamlined solution that enhances user experience and decision-making. Lastly, recognizing the limited visibility for providers in reaching a broader audience, the project endeavors to create a platform that increases visibility, allowing providers to showcase their offerings to a wider customer base. The Axiom Sphere project, thus, seeks to address these identified needs, providing a comprehensive solution that streamlines procurement processes, enhances connectivity, and fosters transparency and collaboration within the project management ecosystem.

1.5 Existing System

In the current landscape of project management, the existing system for resource procurement and service management often operates through disparate channels and platforms. Project managers and individuals seeking materials or services must navigate through various sources, which can include physical stores, online marketplaces, and service providers with independent websites. This decentralized approach contributes to inefficiencies as users encounter challenges in consolidating information, comparing options, and making informed decisions. Additionally, existing platforms may lack a cohesive user experience, making the process confusing and time-

consuming. The absence of a centralized system results in limited connectivity between resource providers and project managers, hindering effective collaboration. The booking and rating mechanisms for resources or services can also be cumbersome, involving multiple steps and lacking real-time updates. Overall, the existing system exhibits fragmentation, limited connectivity, and inefficiencies in the procurement and management of resources for various projects across different industries. The AxiomSphere project aims to address these shortcomings by introducing a centralized, user-friendly platform that streamlines the procurement process and enhances connectivity within the project management ecosystem.

1.6 Proposed System

The proposed AXIOM SPHERE system is a revolutionary step towards transforming the landscape of project management. In contrast to the existing fragmented approach, the proposed system envisions a centralized, user-friendly platform that streamlines the entire process of resource procurement and service management. Leveraging advanced technologies, the system integrates a smart recommendation engine that provides personalized suggestions based on user preferences and historical data, facilitating more informed decision-making. The platform is designed to be accessible to users with varying levels of technical expertise, ensuring a seamless and intuitive user experience.

Connectivity lies at the heart of the proposed system, addressing the current limitations in collaboration between resource providers and project managers. By creating a dynamic bridge, the system facilitates transparent communication, allowing providers to showcase their offerings directly within the app. A robust booking system simplifies the process for users, eliminating unnecessary intermediaries and enhancing efficiency.

Real-time updates and a comprehensive rating system contribute to a more transparent and accountable environment, where users can make decisions based on the shared experiences of their peers.

Furthermore, the proposed system introduces a dual functionality, catering to both resource providers and customers. Providers can effortlessly showcase their offerings, expanding their reach and fostering a vibrant, interconnected community. The system's adaptability ensures its applicability across diverse industries, ranging from construction to event management and software development.

Mainly AXIOM SPHERE proposed system represents a significant leap forward, offering a comprehensive and efficient solution that addresses the identified challenges, promotes collaboration, and redefines the way projects are managed across various sectors.

1.7 Unique Features of The System

The AXIOM SPHERE system boasts a range of unique features that set it apart in the realm of project management and resource procurement. These distinctive attributes contribute to a more efficient, transparent, and user-friendly experience for both providers and customers.

- **Smart Recommendation Engine:**

A cutting-edge recommendation system leverages advanced algorithms to provide users with personalized suggestions based on their preferences and historical interactions with the platform.

- **Dual Functionality:**

The system caters to both resource providers and customers, allowing seamless navigation between roles. Providers can showcase their offerings, expanding their reach, while customers can effortlessly explore and book resources.

- **Centralized Platform:**
AXIOM SPHERE serves as a centralized hub, consolidating resources and services in one accessible location, eliminating the need for users to navigate multiple channels for their project needs.
- **User-Friendly Interface:**
A thoughtfully designed and intuitive user interface ensures accessibility for users with varying levels of technical expertise, promoting ease of navigation and interaction.
- **Real-Time Updates:**
The system incorporates real-time updates, ensuring that users have access to the latest information about resource availability, bookings, and any changes in ratings or reviews.
- **Comprehensive Rating System:**
A robust rating system allows users to share their experiences and feedback, fostering transparency and accountability within the community and aiding others in making informed decisions.
- **Versatility Across Industries:**
The system is adaptable and designed to cater to a diverse range of industries, from construction to event management and software development, making it a versatile solution for various project needs.
- **Community Collaboration:**
AXIOM SPHERE promotes collaboration within its user community, encouraging providers and customers to engage, share insights, and contribute to the overall success of projects within the platform.
- **Integrated Booking System:**
A streamlined booking system simplifies the process for users, allowing them to book resources directly through the app, reducing the need for intermediaries and minimizing potential delays.
- **Firebase Integration:**
The system integrates Firebase for backend services, enabling efficient data management, real-time updates, and secure user authentication, ensuring a seamless and secure user experience.

1. REQUIREMENT ANALYSIS AND SYSTEM SPECIFICATION

Creating a detailed Feasibility Study and Software Requirement Specification (SRS) document requires a comprehensive analysis of various aspects. Below is an overview of each section:

2.1 Feasibility Study

➤ Technical Feasibility

Analysis of Technology Stack:

Evaluate the compatibility and effectiveness of Flutter, Dart, and Firebase for the technical requirements of AXIOM SPHERE.

➤ Integration Feasibility:

Assess the feasibility of integrating third-party plugins and Firebase for advanced features like real-time updates and user authentication.

➤ Economical Feasibility:

Cost-Benefit Analysis:

Evaluate the overall costs associated with development, maintenance, and potential benefits, including increased user base and revenue generation.

Return on Investment (ROI):

Analyze the projected ROI based on estimated costs and potential revenue streams from the app.

➤ Operational Feasibility:

User Adoption Analysis:

Assess the ease of user adoption, considering the intuitive design and user-friendly interface of Axiom Sphere.

Operational Impact:

Evaluate how the introduction of Axiom Sphere will impact existing operational processes in terms of resource procurement and project management.

2.2 Software Requirement Specification (SRS)

➤ Data Requirements:

- 1. Data Model:** Define the data structure, including user profiles, resource/service details, ratings, and reviews.
- 2. Database Requirements :**Specify the database system, such as Firebase Realtime Database, for efficient data storage and retrieval.

➤ Functional Requirements:

- 1. User Roles and Permissions:**Define user roles (provider, customer) and their corresponding permissions within the app.
- 2. Resource Exploration and Booking:**Specify functions for users to explore resources, view details, and seamlessly book them within the app.

➤ Performance Requirements:

- 1. Response Time:**Define the acceptable response time for actions like resource exploration, booking, and real-time updates.
- 2. Scalability:**Ensure the system can scale to accommodate a growing user base without compromising performance.

- **Dependability Requirement:**
 1. **Reliability:** Specify the system's reliability, ensuring that booked resources are accurately reserved, and data is consistently available.
- **Maintainability Requirement:**
 1. **Modularity:** Design the app with modular components, facilitating future updates and maintenance.
- **Security Requirement:**
 1. **User Authentication:** Implement secure user authentication through Firebase to protect user data and interactions.
 2. **Data Encryption:** Specify encryption standards for secure transmission and storage of sensitive information.
- **Look and Feel Requirement:**
 1. **UI/UX Design:** Define the overall look and feel, ensuring a consistent and visually appealing user interface.
 2. **Responsive Design:** Ensure the app is responsive, providing a seamless experience across different devices and screen sizes.

2.3 Validation

Validation of the AXIOM SPHERE project involves ensuring that the developed system meets its specified requirements and satisfies the needs of its users. The validation process spans across different aspects of the project:

- **Functional Validation:**
 - Scenario Testing:** Validate the system against predefined scenarios to ensure that users can successfully perform essential tasks such as resource exploration, booking, and rating.
 - Use Cases Verification:** Confirm that the system handles all specified use cases accurately, including dual functionality for both providers and customers.
- **User Acceptance Testing (UAT):**
 - End-User Feedback:** Gather feedback from end-users, including both providers and customers, to ensure that the application meets their expectations and needs.
 - Usability Testing:** Evaluate the user interface and overall usability to verify that it aligns with user expectations.
- **Performance Validation:**
 - Load Testing:** Assess the system's performance under different loads, ensuring it remains responsive and stable even during peak usage periods.
 - Response Time Verification:** Confirm that the response time for critical actions, such as resource booking and updates, meets the defined performance requirements.
- **Cross-Platform Compatibility:**
 - Device Testing:** Verify that the AXIOM SPHERE app functions seamlessly across different devices, screen sizes, and operating systems.
- **Regulatory Compliance:**
 - Compliance Verification:** Ensure that the system adheres to relevant industry regulations, standards, and legal requirements.

2.4 SDLC Model:

For the AXIOM SPHERE project, the chosen Software Development Life Cycle (SDLC) model is the Agile methodology.

Agile provides a flexible and iterative approach that aligns well with the dynamic requirements of the project. The development process is divided into short, time-boxed iterations, commonly known as sprints, allowing for incremental development and continuous feedback from stakeholders. The Agile model accommodates changes in requirements and priorities efficiently, ensuring that the project remains adaptable to evolving needs. This iterative nature of Agile enables the development team to deliver functional increments of the AXIOM SPHERE app at the end of each sprint, allowing for early user feedback and validation. The continuous collaboration between the development team and stakeholders promotes a transparent and responsive development process. Agile's emphasis on customer satisfaction, frequent releases, and the ability to accommodate changes aligns with the goals of the AXIOM SPHERE project, where user experience and evolving industry needs are central to success.

2.5 Expected Hurdles For Axiom Sphere Project

While the AXIOM SPHERE project holds significant promise, several potential hurdles may be encountered during its development and deployment. Identifying these challenges early allows for proactive measures to mitigate their impact. Some expected hurdles include:

Technical Complexity:

Developing a cross-platform mobile application with integrated features like a smart recommendation engine, real-time updates, and Firebase integration may pose technical challenges. Ensuring seamless functionality across different devices and platforms requires careful consideration.

User Adoption:

Encouraging users to adopt a new platform for resource procurement may face resistance, particularly if existing methods are deeply ingrained in their workflows. Effective communication and user training will be crucial to overcoming this hurdle.

Security Concerns:

The integration of Firebase and handling sensitive user data necessitates a robust security infrastructure. Addressing potential security concerns and ensuring compliance with privacy regulations will be critical.

Data Accuracy and Integrity:

Maintaining the accuracy and integrity of data, particularly in a real-time environment, poses a challenge. Handling simultaneous user interactions, bookings, and updates requires a robust data management strategy.

Third-Party Integration:

Integrating third-party plugins and services, while enhancing functionality, may introduce compatibility issues or dependencies. Ensuring seamless integration and resolving any conflicts will be essential.

User Experience Design:

Designing a user-friendly interface that caters to users with varying levels of technical expertise is crucial. Striking the right balance between simplicity and functionality may present design challenges.

Community Building:

Fostering a vibrant user community where both providers and customers actively participate may take time. Strategies for community engagement and collaboration need to be carefully implemented.

Scalability:

As the user base grows, ensuring that the system remains scalable and responsive under increased loads may be a challenge. Scalability testing and performance optimization will be ongoing considerations.

Regulatory Compliance:

Adhering to industry regulations and privacy laws requires ongoing diligence. Changes in regulations may necessitate updates to ensure continued compliance.

Project Timeline Management:

Balancing feature development, testing, and user feedback within specified timelines can be challenging. Effective project management and prioritization are crucial to meeting deadlines.

CHAPTER 3: SYSTEM DESIGN

3.1 Design Approach

The design approach for the AXIOM SPHERE project centers on user-centricity, scalability, and security. Embracing a user-centered design methodology, the app prioritizes understanding user needs through iterative prototyping and responsive design. Information architecture ensures a logical flow, guiding users seamlessly. Visual design incorporates a cohesive brand identity, intuitive icons, and imagery. Scalability is addressed through a modular approach, optimizing performance as the user base expands. Security integration focuses on robust user authentication and data encryption. Feedback mechanisms and community-building features actively involve users in shaping the platform. The design ethos seeks to create a versatile, secure, and engaging environment for both providers and customers.

Function-Oriented Approach:

The AXIOM SPHERE project adopts a function-oriented approach with a primary focus on user satisfaction. The key objectives revolve around modular design and operational efficiency. The system is designed with distinct, interrelated functions, ensuring a modular structure that facilitates easier maintenance and updates. Efficiency is paramount, aiming to optimize resource exploration, booking, and communication between providers and customers. By prioritizing clear and distinct functions, the project aims to enhance the overall user experience, making resource procurement and project management streamlined and efficient within a modular and easily maintainable framework.

3.2 Data Flow Diagrams:

Level 0 DFD:

The Level-0 Diagram for AXIOM SPHERE illustrates the high-level overview of the entire system, presenting a concise representation of its main processes and interactions. At this level, the focus is on identifying major system components and their relationships without delving into detailed sub-processes.

In the context of AXIOM SPHERE, the Level-0 Diagram encapsulates the core functionalities such as user interaction, resource procurement, and community engagement. The primary components include users (both providers and customers), the core application module, and external elements such as third-party plugins and the Firebase backend.

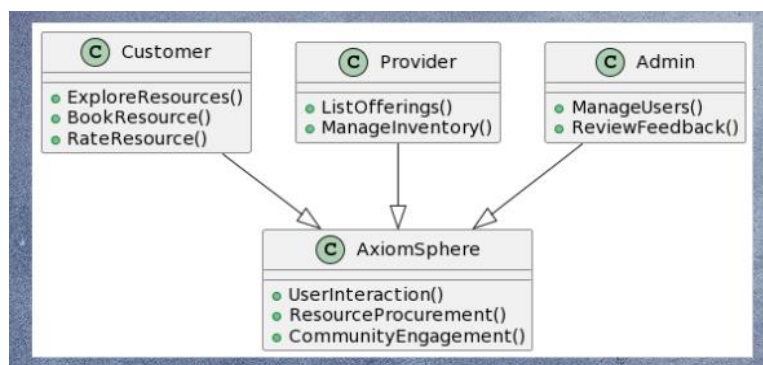


Figure 1Level zero DFD

This diagram serves as a foundation for more detailed decomposition in subsequent levels, providing a clear and accessible depiction of the AXIOM SPHERE system's primary functions and their interconnections.

Level 1 DFDs:

The Level-1 Diagram for AXIOM SPHERE delves deeper into the system, breaking down the

main processes outlined in the Level-0 Diagram into more detailed sub-processes. At this level, the focus is on defining the key components and interactions within the AXIOM SPHERE application. The diagram includes user-specific processes, such as resource exploration, booking, and rating, each encapsulated within the broader user interaction module. The application module further details the internal processes, including secure user authentication, data processing, and communication with the Firebase backend. External components, such as third-party plugins, are also depicted, emphasizing their integration with the core application.

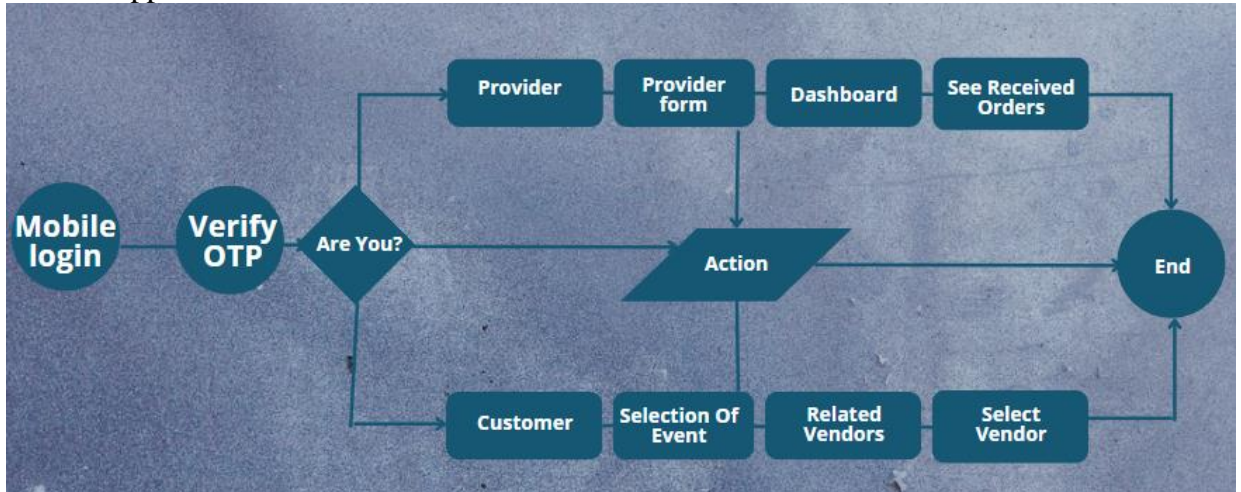


Figure 2 : Level 1 DFD

This Level-1 Diagram provides a more granular view of the AXIOM SPHERE system, laying the groundwork for subsequent, even more detailed levels of decomposition.

Use Case Diagram:

The AXIOM SPHERE Use Case Diagram illustrates the interactions between key actors and the system, showcasing the primary functionalities of the platform. The primary actors identified are the Customer, the Provider, and the Admin.

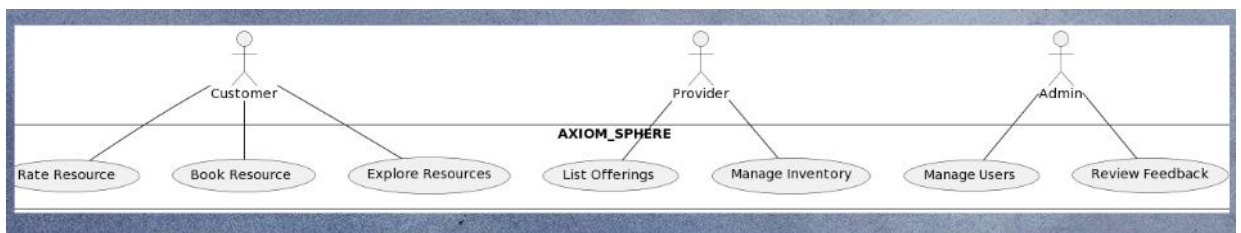


Figure 3: Use Case Diagram

Provider:

The Provider engages with the system through functionalities such as List Offerings to showcase available resources and Manage Inventory to efficiently handle their offerings.

Customer:

The Customer interacts with the system by utilizing essential functionalities like Explore Resources for discovering available resources, Book Resource for reserving desired items, and Rate Resource for providing feedback on their experiences.

Admin:

The Admin role involves system administration with functionalities like Manage Users to oversee user accounts and Review Feedback to monitor and respond to user reviews and ratings.

Sequence Diagram :

The AXIOM SPHERE Sequence Diagram delineates the chronological sequence of interactions between different components within the system, offering a detailed portrayal of the dynamic flow of activities.

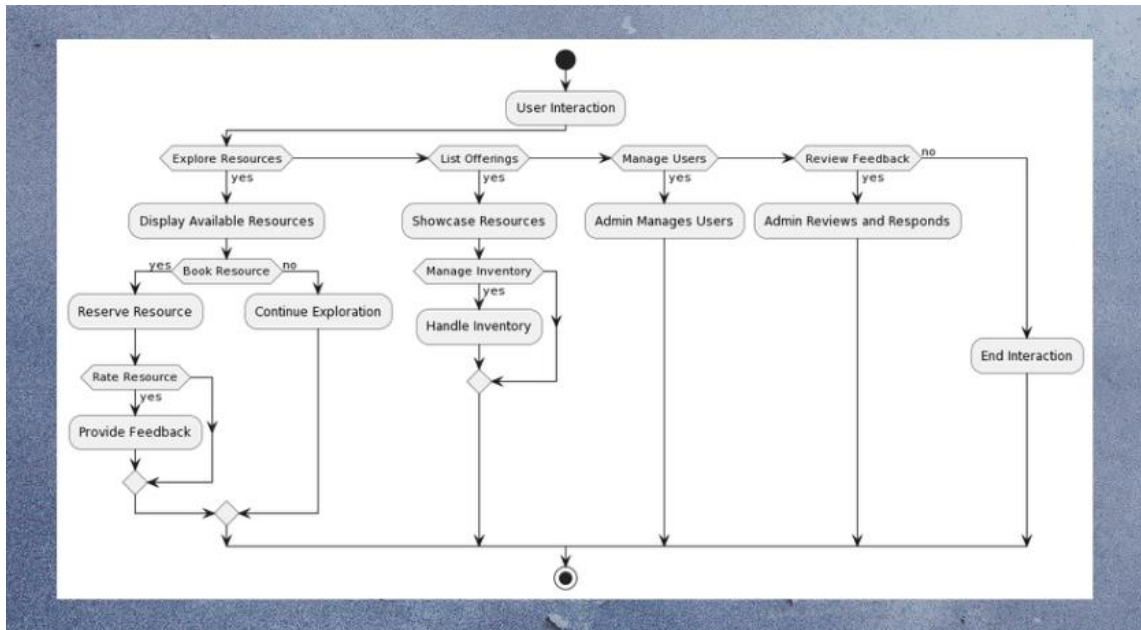


Figure 4: Sequence diagram

The diagram commences with the initiation of the user's interaction, illustrating a series of sequential steps that unfold as the user engages with the platform. The diagram captures the nuanced interactions between the user, system modules, and external components, showcasing the logical order of events such as resource exploration, booking, and rating.

This sequential representation not only highlights the temporal relationships between actions but also provides a comprehensive view of how different elements collaborate to deliver a seamless experience for both customers and providers within the AXIOM SPHERE ecosystem.

Flowcharts:

As a Provider:

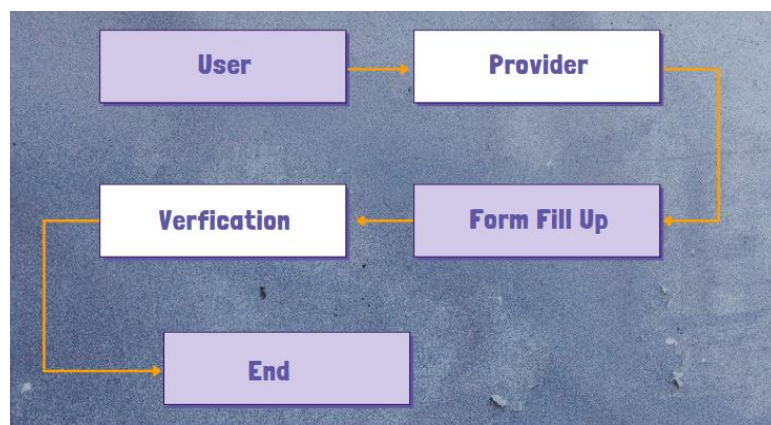


Figure 5: Flow Chart of Provider

As a Customer:

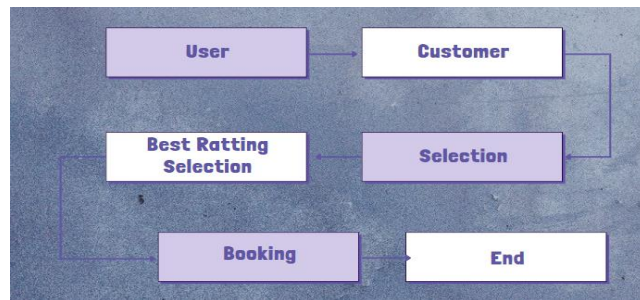


Figure 6: Flow Chart of Customer

The key Aspects of The AXIOM SPHERE User Interface Design:

Aspect	Description
User-Friendly Navigation	Clear and intuitive navigation structure with easy access to essential functionalities.
Unified Dashboard	Centralized dashboard providing users with a comprehensive view of resource listings, booking status, and notifications.
Resource Exploration	Visually engaging interface for customers to browse resources and for providers to showcase offerings.
Booking Process	Streamlined, step-by-step interface guiding users through the reservation process with clear calls-to-action.
Rating and Feedback	Intuitive system seamlessly integrated into the booking and post-booking processes for users to share their experiences.
Provider Management	Dedicated interface for providers to efficiently manage inventory, add, modify, or remove resources.
Admin Dashboard	Interface designed for efficient user management and oversight, allowing admins to review activities and respond to feedback.
Responsive Design	Ensures a consistent and enjoyable experience across various devices and screen sizes.
Visual Consistency	Cohesive visual identity with a harmonious color scheme, legible typography, and consistent design elements.
Accessibility Features	Integrates accessibility features such as alt text for images, clear contrast ratios, and keyboard navigation options.
Interactive Elements	Incorporates interactive elements like animated transitions and real-time updates for a dynamic and engaging user experience.

Figure 7: Tabular information of Interface Design

Database Design:

Collection Name	Description
users	Stores user details such as username, email, role, etc.
resources	Holds information about available resources, including name, description, availability, etc.
bookings	Records booking details, including user_id, resource_id, booking_date, status, etc.
feedback	Stores user feedback with user_id, resource_id, rating, comments, timestamp, etc.
providers	Contains details about resource providers, including business_name, user_id, etc.
admins	Stores admin details with user_id, admin_specific_fields, etc.

Figure 8: Tabular Information of Database Design

3.3 Database Manipulation:

Database manipulation in AXIOM SPHERE involves interacting with the database to perform operations such as creating, reading, updating, and deleting data. The manipulation is facilitated through queries and commands executed against the Firebase database. Below is a theoretical overview of the key database manipulation operations in AXIOM SPHERE:

1. User Registration:

Objective: To add a new user to the database upon registration.

Procedure:

Collect user registration details.

Execute a database command to insert a new document into the "users" collection with the user's information (e.g., username, email, role).

Ensure data integrity and handle errors during the insertion process.

2. Resource Listing:

Objective: To display a list of available resources to users.

Procedure:

Execute a database query to retrieve documents from the "resources" collection.

Process the retrieved data to present it in the user interface, including resource names, descriptions, and availability status.

3. Booking a Resource:

Objective: To record a user's booking of a particular resource.

Procedure:

Collect booking details (user ID, resource ID, booking date, etc.).

Execute a database command to insert a new document into the "bookings" collection with the booking information.

Update the availability status of the booked resource in the "resources" collection.

Ensure atomicity and consistency during the booking process.

4. User Feedback:

Objective: To capture and store user feedback on a resource.

Procedure:

Collect user feedback details (user ID, resource ID, rating, comments, timestamp).

Execute a database command to insert a new document into the "feedback" collection with the feedback information.

Optionally, update aggregated feedback metrics for the corresponding resource or user in other collections.

5. Managing Inventory (Provider):

Objective: To allow resource providers to manage their inventory.

Procedure:

For adding or updating resources, execute a database command to insert or update documents in the "resources" collection.

For removing resources, execute a database command to delete documents from the "resources" collection.

Ensure proper error handling and validation during inventory management.

6. Admin Oversight:

Objective: To provide administrators with the ability to manage users and review feedback.

Procedure:

Execute queries to retrieve user details and feedback data from the "users" and "feedback" collections.

Implement administrative functionalities such as user suspension, account deletion, or responding to user feedback.

Ensure that admin-specific actions are securely executed and logged.

These database manipulation operations provide a foundation for understanding how AXIOM SPHERE interacts with the Firebase database to deliver its functionalities. The actual implementation would involve writing and executing Firebase database commands and queries based on the Firebase SDK or other relevant technologies used in the project.

3.4 Methodology:

The methodology for developing AXIOM SPHERE involves a systematic approach to ensure the successful design, implementation, and deployment of the application. Below is a generic outline of the methodology, encompassing key stages from planning to maintenance.

Stage	Objective	Tasks
1. Project Planning	Define project scope, objectives, and requirements.	- Conduct requirements analysis. - Define features, functionalities, and constraints. - Create a project plan with timelines and milestones.
2. Research and Analysis	Gather information about target users, market trends, and best practices.	- Conduct user interviews or surveys. - Research similar applications. - Identify technological trends and advancements.
3. System Design	Create a comprehensive design for the AXIOM SPHERE system.	- Develop system architecture. - Design Firebase database schema. - Create wireframes and prototypes for the user interface.
4. Frontend and Backend Development	Implement the designed system components.	- Develop frontend using Flutter. - Implement backend using Firebase, including user authentication, database management, and cloud functions. - Ensure data security and privacy.
5. Testing	Verify functionality, performance, and security.	- Conduct unit testing for components. - Perform integration testing. - Execute user acceptance testing (UAT).
6. Deployment	Release AXIOM SPHERE for public use.	- Prepare deployment scripts and configurations. - Deploy the application on relevant platforms (app stores, web servers). - Monitor deployment process and address issues.
7. User Training and Onboarding	Familiarize users with AXIOM SPHERE.	- Create user documentation and tutorials. - Provide onboarding support. - Gather feedback from initial users for potential improvements.
8. Maintenance and Updates	Ensure continued functionality and relevance.	- Establish system for monitoring and addressing user-reported issues. - Regularly update the application with new features and enhancements. - Conduct periodic security audits.
9. User Feedback and Iteration	Continuously improve AXIOM SPHERE based on user feedback.	- Collect and analyze user feedback through surveys, reviews, and support channels. - Prioritize and implement iterative updates to address user concerns and enhance user experience.

Figure 9: Axiom Sphere Methodology

This methodology provides a structured framework for the development and evolution of AXIOM SPHERE. It emphasizes collaboration between development, design, and user

engagement teams to create a robust and user-friendly application. The iterative nature of the methodology allows for flexibility and adaptability throughout the development lifecycle.

➤ **Iterative Development:**

Iterative development in the context of AXIOM SPHERE involves a cyclical process of planning, designing, implementing, testing, and refining the application in multiple iterations. Each iteration builds upon the previous one, incorporating user feedback and insights to enhance the application.

The iterative development process for AXIOM SPHERE is a continuous cycle, where each iteration informs the next. Regularly collecting user feedback, refining features, and staying attuned to industry trends contribute to the ongoing success and relevance of the application. The development team should be agile, adaptive, and committed to delivering a product that evolves to meet user needs and expectations.

➤ **Collaborative Development:**

In the realm of AXIOMSPHERE, collaborative development stands as a cornerstone philosophy. The ethos of collaboration extends beyond mere code contributions; it encompasses a collective effort to innovate, problem-solve, and elevate the user experience. Developers, designers, and stakeholders collaborate seamlessly, leveraging their unique expertise to bring diverse perspectives to the table. This collaborative synergy ensures that AXIOMSPHERE evolves dynamically, benefitting from the collective wisdom of its development community. Regular team interactions, shared repositories, and open lines of communication characterize the collaborative spirit that propels AXIOMSPHERE forward, fostering a development culture where every contribution contributes to the collective success of the project.

➤ **User-Centric Design:**

At the heart of AXIOMSPHERE beats a commitment to user-centric design, where every feature, interface element, and interaction is meticulously crafted with the end user in mind. The user experience is not merely a consideration but a guiding principle steering development decisions. UX designers immerse themselves in understanding user behaviors, needs, and pain points, employing empathy to shape an interface that resonates seamlessly with users. Iterative design cycles, user testing, and feedback loops are integral components, ensuring that AXIOMSPHERE aligns closely with the preferences and expectations of its diverse user base. In the world of AXIOMSPHERE, every line of code is a step toward enhancing the user journey, creating an application that feels intuitive, accessible, and tailored to individual user needs.

➤ **Continuous Integration and Deployment:**

In the realm of AXIOMSPHERE's development lifecycle, continuous integration and deployment (CI/CD) form the backbone of an agile and responsive methodology. CI/CD pipelines automate the testing, integration, and deployment processes, allowing for swift and reliable updates. With each code commit, automated tests ensure the integrity of the application, preventing regressions and maintaining a high standard of code quality. This commitment to automation expedites the delivery of new features and improvements, minimizing downtime and ensuring a seamless experience for users. The CI/CD philosophy within AXIOMSPHERE promotes a development environment where changes are not just timely but also reliable, fostering a culture of continuous improvement and innovation.

CHAPTER-4 IMPLEMENTATION, TESTING AND MAINTENANCE

The languages, IDEs, tools, and technologies used for the implementation of axiomsphere

Category	Technology	Description
Programming Language	Dart	Dart is the primary language for building the AXIOMSPHERE app. It is the language used with the Flutter framework for cross-platform mobile development.
Frontend Framework	Flutter	Flutter is an open-source UI software development toolkit by Google. It is used for building natively compiled applications for mobile, web, and desktop from a single codebase.
Backend Database	Firebase	Firebase, a Google Cloud service, is used as the backend database for AXIOMSPHERE. It provides real-time data synchronization and authentication services.
IDE (Integrated Development Environment)	Visual Studio Code	Visual Studio Code is the preferred IDE for developing AXIOMSPHERE. It offers a lightweight, yet powerful, code editing environment with support for Dart and Flutter.
Version Control	Git	Git is utilized for version control, enabling collaborative development, tracking changes, and managing the source code repository efficiently.
Testing Frameworks	Flutter Testing (Unit and Widget Tests)	Flutter Testing framework is used for writing unit tests and widget tests to ensure the functionality and UI consistency of the application.
Deployment Platforms	App Store, Google Play, Web Servers	AXIOMSPHERE is deployed on major app stores (e.g., App Store, Google Play) for mobile platforms, and on web servers to ensure accessibility across various platforms.

4.1. The Schedule

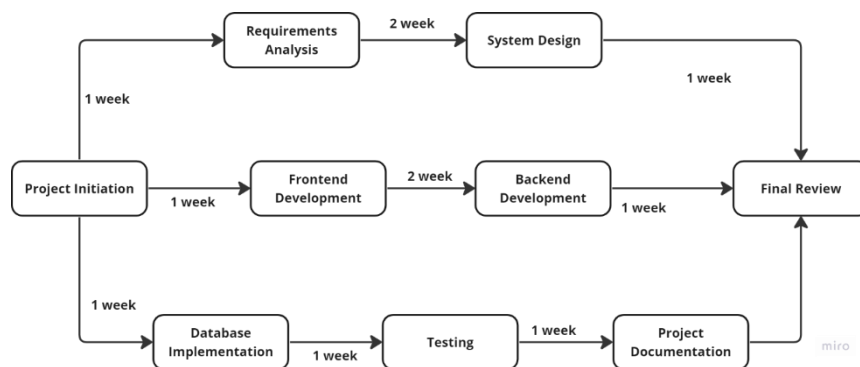


Figure 10 Schedule PERT chart

4.2 Software Testing

Software testing is a critical aspect of the Axiom Sphere development lifecycle, ensuring the delivery of a robust, reliable, and user-friendly application. The testing process encompasses various levels and types of testing to validate different aspects of the application's functionality, performance, and security. Here's an overview of the software testing strategies employed for Axiom Sphere

1. Unit Testing:

Objective: Validate individual components and functions.

Implementation:

Utilize the Flutter Testing framework for Dart to write unit tests.

Test individual functions, methods, and classes in isolation.

Focus Areas:

Ensure correctness of algorithms and logic within isolated components.

2. Widget Testing:

Objective: Validate the behavior of UI components.

Implementation:

Use Flutter's widget testing framework to test UI components.

Verify interactions, navigation, and UI responsiveness.

Focus Areas:

Confirm that UI elements render correctly.

Validate user interactions and transitions.

3. Integration Testing:

Objective: Validate the interactions between different modules.

Implementation:

Execute tests that cover the integration of backend services and frontend components.

Validate data flow and communication between various parts of the application.

Focus Areas:

Ensure seamless communication between the frontend and backend.

Verify the integration of features and services.

4. End-to-End (E2E) Testing:

Objective: Validate the entire application workflow.

Implementation:

Use E2E testing frameworks compatible with Flutter, such as Flutter Driver.

Focus Areas:

Validate critical user journeys from start to finish.

Confirm the correctness of complex user workflows.

5. Performance Testing:

Objective: Assess the application's responsiveness and stability under different conditions.

Implementation:

Use performance testing tools to simulate various user loads and scenarios.

Measure response times, resource utilization, and system stability.

Focus Areas:

Identify and address performance bottlenecks.

Ensure optimal performance under varying conditions.

6. Security Testing:

Objective: Identify and mitigate potential security vulnerabilities.

Implementation:

Conduct security audits using specialized tools.

Review the application for common security issues.

Focus Areas:

Validate data protection measures.

Identify and address potential security vulnerabilities.

7. User Acceptance Testing (UAT):

Objective: Validate the application against user expectations.

Implementation:

Collaborate with real users to gather feedback and insights.

Conduct usability testing to ensure the application meets user needs.

Focus Areas:

Address user-reported issues and concerns.

Ensure the application aligns with user expectations.

8. Regression Testing:

Objective: Ensure that new updates do not adversely affect existing functionality.

Implementation:

Automated regression testing using frameworks compatible with Flutter.

Focus Areas:

Confirm that updates do not introduce new bugs.

Maintain the stability of existing features.

9. Accessibility Testing:

Objective: Assess the application's accessibility for users with diverse needs.

Implementation:

Utilize accessibility testing tools and guidelines.

Verify compliance with accessibility standards (e.g., WCAG).

Focus Areas:

Ensure the application is usable by individuals with disabilities.

Implement improvements for enhanced accessibility.

10. Cross-Browser and Cross-Platform Testing:

Objective: Ensure consistent functionality across different browsers and platforms.

Implementation:

Test the application on various web browsers and mobile platforms.

Address any inconsistencies in behavior or appearance.

Focus Areas:

Confirm a seamless experience across diverse user environments.

Optimize the application for different devices and screen sizes.

Conclusion:

The comprehensive testing strategy for AXIOM SPHERE encompasses various testing levels and types, ensuring that the application not only meets functional requirements but also excels in terms of performance, security, and user experience. The iterative testing process, combined with continuous user feedback, contributes to the continuous improvement and reliability of AXIOM SPHERE throughout its development lifecycle.

CHAPTER-5 RESULT AND DISCUSSION

5.1 User Interface Representation:

AXIOM SPHERE, envisioned as a user-centric platform, boasts a vibrant and intuitive user interface that seamlessly blends functionality with an engaging visual experience. The home screen sets the tone, offering users a welcoming dashboard where they can effortlessly navigate through various categories. Popular sectors such as Construction, Event Management, and Software Development are prominently featured, providing users quick access to their areas of interest. Additionally, the home screen highlights featured resources and upcoming events, ensuring users are always informed about the latest and most relevant offerings.

As users delve into resource listings, they encounter a well-organized and categorized display of available resources. Each resource card is a snapshot of pertinent information – a concise description, user ratings, and real-time availability status. To enhance user search efficiency, filters and search options empower users to tailor their exploration based on specific criteria. Moving into the detailed view of a selected resource or event, users find comprehensive information, including provider details, pricing, an availability calendar, and user ratings. This detailed view serves as the launch pad for the seamless booking or registration process.

The booking or registration process itself is designed for simplicity and efficiency, allowing users to confirm their selections with ease. Integrated user profiles streamline this process, offering quick access to booking history, ratings, and personalized preferences. Upon successful bookings, users receive confirmation notifications and email receipts for their records. The user profile serves as a hub for users, granting them access to their booking history, ratings, and account settings. Social features, including user reviews and ratings, enrich the community aspect of AXIOM SPHERE, fostering trust and reliability among users.

The admin dashboard, accessible on the backend, provides a secure interface for administrators to monitor and manage user activities. Robust tools for reviewing and responding to user feedback contribute to continuous improvement. Analytics and reporting features empower administrators to track resource usage and user engagement, ensuring the platform remains optimized and responsive to user needs. The settings menu and preferences section offer users a personalized experience, allowing them to customize notification settings, language preferences, and other options. axiom sphere's commitment to accessibility is evident through features like dark mode and accessibility options, ensuring an inclusive and user-friendly experience for all. overall, the axiom sphere user interface is meticulously crafted to offer a seamless, engaging, and accessible experience for both providers and users.

Brief Description of Various Modules of the Axiom Sphere:

- **User Authentication and Profiles:**

The User Authentication module is the gateway to AXIOM SPHERE, ensuring secure access for both providers and customers. Users can create accounts, log in, and manage their profiles. This module forms the foundation for personalized experiences, enabling users to track their bookings, reviews, and preferences.

- **Resource Management:**

The Resource Management module empowers providers to list and manage their resources efficiently. Providers can add detailed descriptions, set availability, and update pricing. Customers, on the other hand, can explore a rich array of resources, filtering based on preferences and seamlessly booking what they need.

- **Booking and Reservation:**

The Booking and Reservation module facilitates a smooth and secure process for users to book resources or register for events. Users can view availability calendars, select dates, and complete reservations with ease. Confirmation notifications and email receipts enhance user confidence and provide a record of transactions.

- **Reviews and Ratings:**

Fostering a community-driven environment, the Reviews and Ratings module allows users to provide feedback on their experiences. Both providers and customers can leave reviews, contributing to a transparent and trustworthy platform. Aggregate ratings provide quick insights for users making decisions.

- **Admin Dashboard:**

The Admin Dashboard module serves as the command center for administrators. It offers tools for monitoring user activities, managing resources, and responding to user feedback. Analytics and reporting features enable administrators to make data-driven decisions for platform optimization.

- **Notifications and Alerts:**

Keeping users informed and engaged, the Notifications and Alerts module sends real-time updates on bookings, upcoming events, and promotions. In-app messaging features enable direct communication between users and providers, enhancing the overall user experience.

- **Accessibility and Customization:**

The Accessibility and Customization module prioritizes inclusivity. Users can personalize their experiences through settings such as language preferences, notification preferences, and accessibility features. Dark mode enhances usability during nighttime use.

- **Security and Compliance:**

The Security and Compliance module ensures the safety and privacy of user data. It includes measures for secure authentication, encrypted transactions, and compliance with data protection regulations. Regular security audits and updates contribute to a secure environment.

- **Search and Discovery:**

The Search and Discovery module empowers users to explore the platform efficiently. Robust search functionality and filters enable users to find resources or events tailored to their needs. Featured categories and trending resources enhance discoverability.

- **Help and Support:**

The Help and Support module provides comprehensive assistance to users. A detailed help center offers FAQs, guides, and troubleshooting tips. In-app chat support ensures users can quickly seek assistance for any queries or concerns.

These modules collectively form the intricate architecture of AXIOM SPHERE, creating a seamless, user-centric platform for resource management, event registration, and community interaction. Each module plays a pivotal role in enhancing the overall user experience and ensuring the reliability and trustworthiness of the platform.

Snapshots of Axiom sphere:

1. Splash screen and login

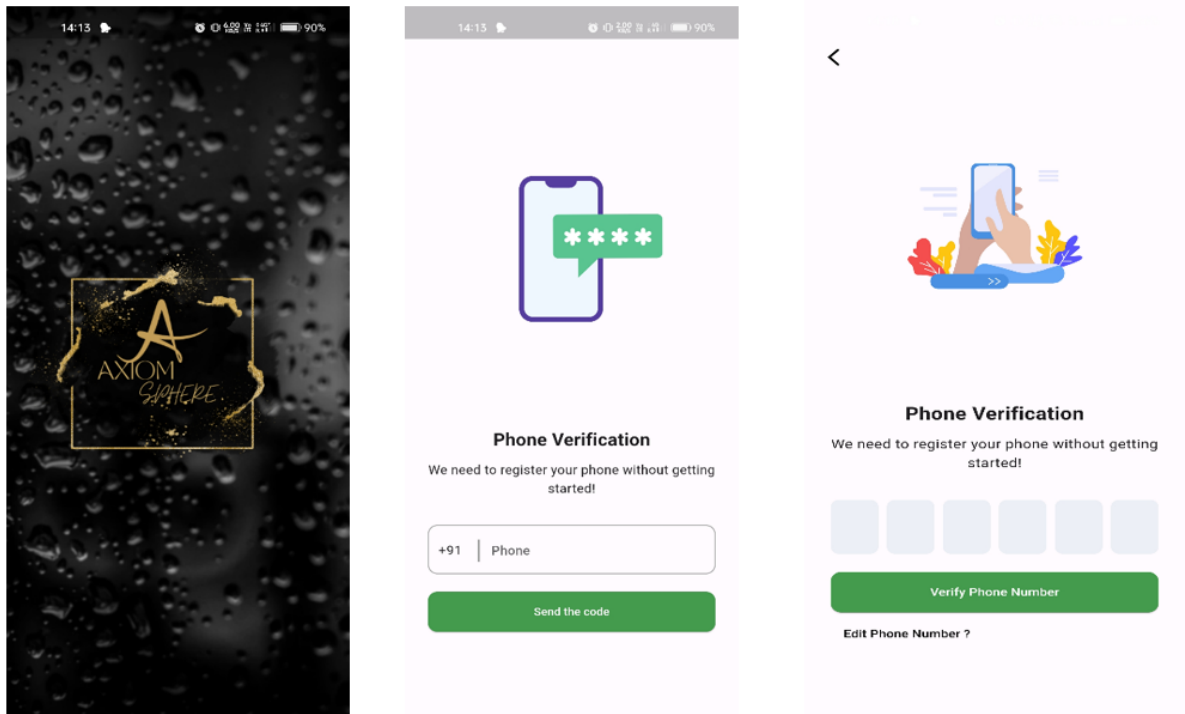


Figure 11: Splash And Mobile Login

2. Under Provider:

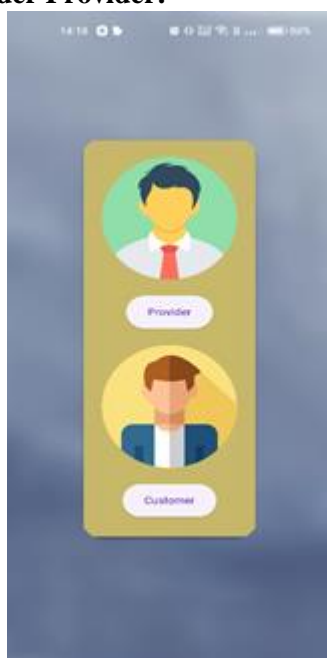


Figure 12: User Selection

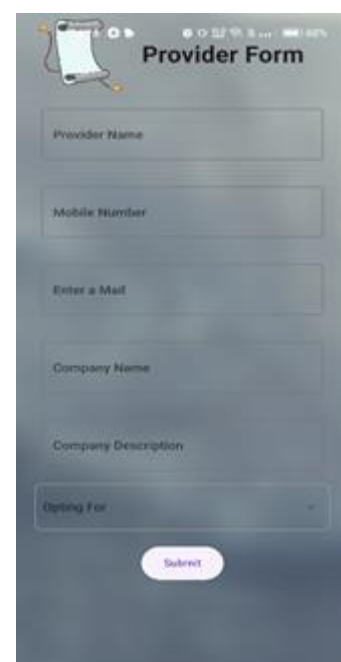


Figure 13: Provider Form

3. Under Customer:

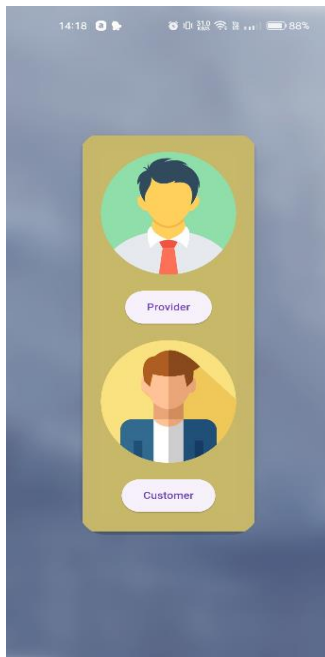


Figure 14: By Clicking customer



Figure 15 Construction Of Building

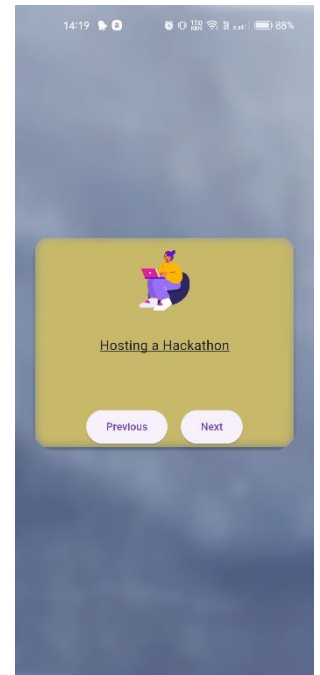


Figure 16 Hosting a Hackathon

4. Under Event management

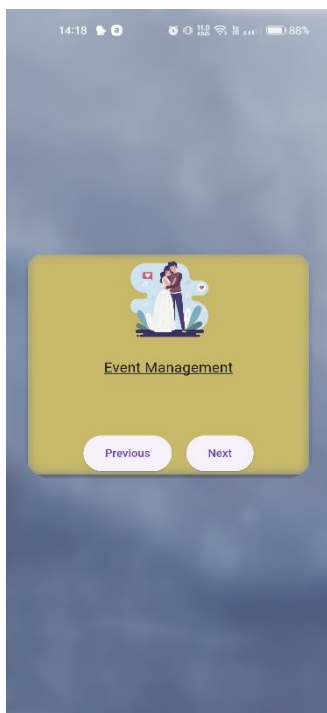


Figure 17 By Clicking Event Management



Figure 18 Under Event Management

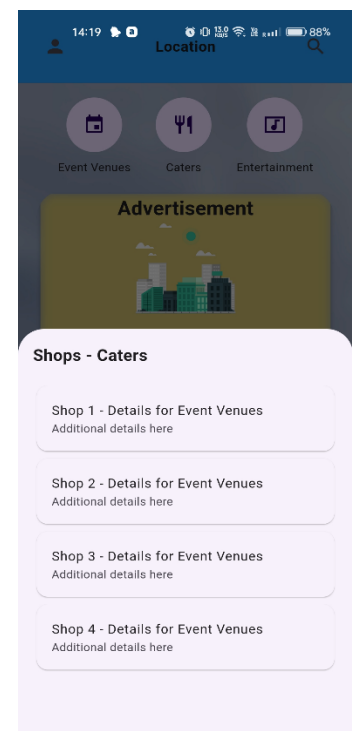


Figure 19 Cater Shops

5.2 Backend Database Connection

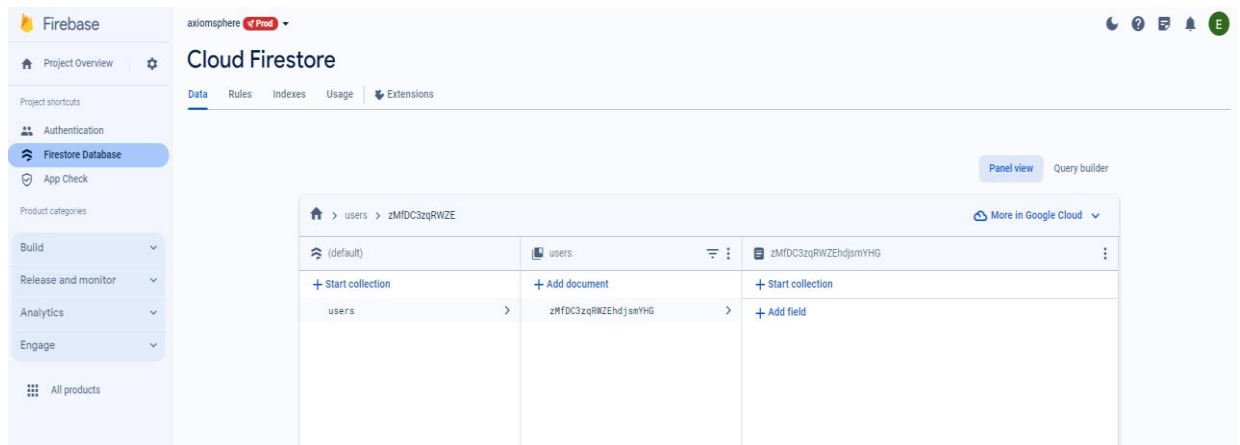


Figure 20 Fire Store Database

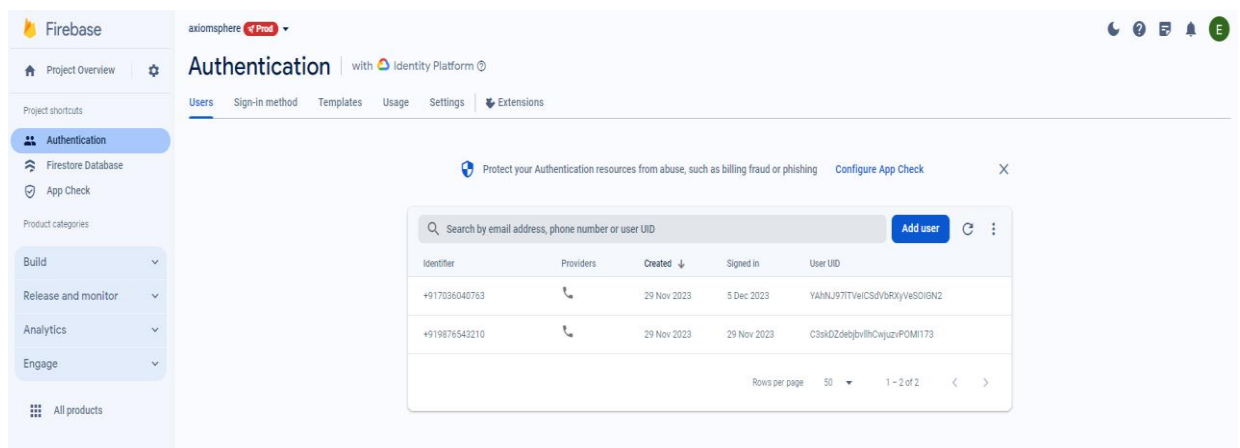


Figure 21 Authentication

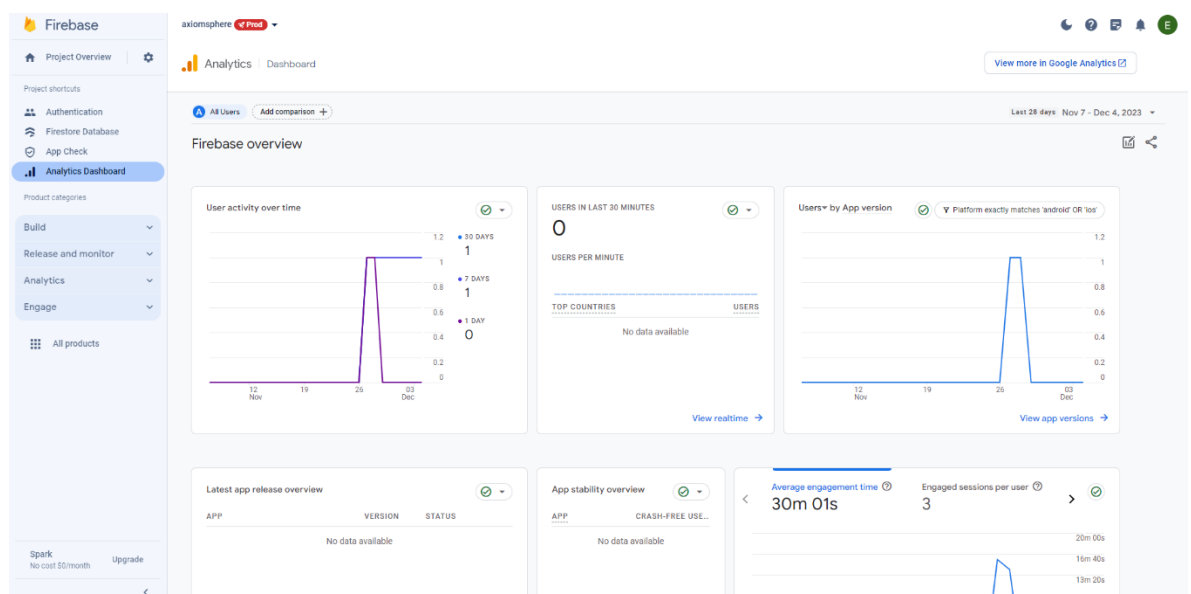


Figure 22 Analytics

CHAPTER 6: CONCLUSION AND FUTURE SCOPE

6.1 Conclusion

In conclusion, axiom sphere stands as a comprehensive and dynamic platform that redefines the landscape of resource management, event coordination, and community collaboration. Through meticulous design and user-centric features, AXIOM SPHERE bridges the gap between providers and customers, offering a seamless and intuitive experience.

The innovative approach to user authentication and profiles establishes a secure foundation, allowing users to effortlessly navigate the platform while personalizing their interactions. The Resource Management module empowers providers to showcase their offerings effectively, while customers benefit from a diverse array of resources accessible through an efficient booking and reservation process.

The Reviews and Ratings module fosters a transparent and trustworthy community, where user feedback shapes the platform's ongoing evolution. The Admin Dashboard ensures efficient oversight, providing administrators with the tools needed to maintain platform integrity and respond proactively to user needs.

Notifications and alerts keep users engaged and informed, creating a dynamic environment where users can connect in real-time. The platform's commitment to accessibility and customization reflects a dedication to inclusivity, ensuring that AXIOM SPHERE is accessible and adaptable to users with diverse preferences and needs.

Security and compliance measures underscore the platform's commitment to safeguarding user data and ensuring a secure digital environment. The Search and Discovery module enhances user experience by facilitating efficient exploration of the platform's rich offerings, and the Help and Support module stands as a beacon of assistance, providing users with the resources needed to navigate any challenges.

In essence, AXIOM SPHERE goes beyond conventional resource management platforms. It fosters a collaborative ecosystem where providers and customers mutually benefit, and innovation is propelled by user feedback. The platform's success lies not only in its functionality but in its ability to adapt, evolve, and continuously enhance the user experience. As AXIOM SPHERE paves the way for a new era in resource management, it stands poised to leave an indelible mark on the landscape of collaborative platforms.

In the ever-evolving digital landscape, AXIOM SPHERE emerges as a beacon of efficiency and collaboration, setting new standards for resource management platforms. The platform's commitment to user experience, from the seamless onboarding process to the personalized profiles and intuitive booking workflows, underscores a dedication to simplifying complex tasks. AXIOM SPHERE envisions a future where individuals and businesses can effortlessly connect, share resources, and contribute to a thriving community-driven ecosystem.

As AXIOM SPHERE continues to grow and adapt, its journey is intricately intertwined with the diverse stories and experiences of its users. The platform's success is not just measured by its feature set but by the meaningful connections forged, the resources shared, and the collaborative spirit it instills. AXIOM SPHERE is more than a tool; it is a catalyst for change, fostering a sense of community and empowerment as users navigate the evolving landscape of resource management and collaborative endeavors. With an eye toward the future, AXIOM SPHERE

remains poised to innovate, inspire, and redefine the way we engage with resources and each other in our interconnected digital world.

6.2 Future Scope

In the future development of AXIOM SPHERE, several key enhancements are envisioned:

➤ **Immersive Reality Photos:**

Introduce the capability to include reality photos of shops and function halls, allowing users to explore these spaces in 360 degrees for a more immersive and realistic preview.

➤ **Integration with IT Companies:**

Expand the platform's resource pool by integrating IT companies, creating opportunities for collaborative events, hackathons, and software development initiatives within the tech industry.

➤ **Customer Feedback Comments:**

Implement a commenting system for customer feedback, enabling users to share their experiences. This dynamic feedback loop contributes to transparency and continual improvement.

➤ **Localized Language Support:**

Incorporate localized language support to cater to a diverse global user base, ensuring that users can navigate and engage with the platform in their preferred languages.

➤ **Enhanced Mobile App Features:**

Prioritize continuous improvement and expansion of features on the mobile app to align with the growing trend of mobile-centric interactions, offering users a seamless and feature-rich experience on their mobile devices.

These strategic additions aim to enhance the platform's functionality, accessibility, and user engagement, reinforcing axiom sphere as a dynamic and inclusive resource management platform.

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