

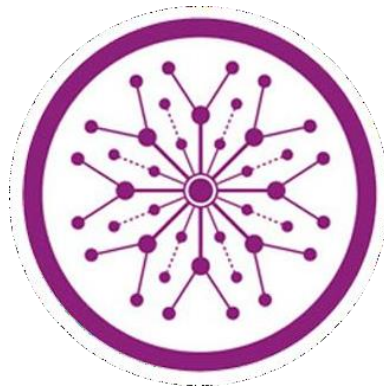
AR-Carnival

Final Year Project

Session 2020 - 2024

A project submitted in partial fulfillment of the degree of

BS in Computer Science



Department of Computer Science

Faculty of Computer Science & Information Technology

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AR Carnival

Change Record

Author(s)	Version	Date	Notes	Supervisor's Signature
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HEAD OF THE DEPARTMENT

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Date: _____

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Dedication

This work is dedicated to my teachers and parents. To my teachers, whose guidance, wisdom, and encouragement have been invaluable throughout my academic journey. Your dedication to fostering knowledge and shaping my intellectual growth has left a lasting impact. To my parents, whose unwavering support, love, and belief in my abilities have been the driving force behind my accomplishments. Your sacrifices and encouragement have been the foundation upon which this achievement stands. This dedication is a heartfelt expression of gratitude for the profound influence you have had on my academic and personal development.

Thank you, teachers and parents, for being my pillars of strength and inspiration. Your contributions are celebrated in this dedication, a small reflection of the immense appreciation and respect I hold for your roles in shaping my journey.

Acknowledgements

I am sincerely thankful to my supervisor, who has been an invaluable source of guidance and support throughout the duration of this project. Their expertise, insightful feedback, and dedication to my academic and professional growth have played a pivotal role in shaping the success of this endeavor. I am grateful for the time and effort they invested in providing constructive criticism, valuable suggestions, and unwavering encouragement.

I would also like to express my gratitude to [mention any additional individuals, mentors, or resources, whose contributions and assistance have greatly enriched the quality of this project.

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This work is a collective effort, and I am fortunate to have had such a supportive network of individuals. Thank you to everyone who has been a part of this journey, contributing to its success in various ways.

Executive Summary

Our new business has launched an augmented reality (AR) management solution aimed at transforming business processes in the management of quality events. This unique technology is changing the attendee experience and programming in a transformative way.

AR's management solutions provide a seamless platform that integrates AR technology with competitors and outperforms today's technology. Schedule of events. This effort has resulted from our recognition of the limitations of traditional planning approaches and the urgent need for detailed, thoughtful solutions.

AR solutions provide emergency management with efficient, cost-effective planning. Event organizers can monitor the site, try to make a difference, and see the weather immediately. This allows people to use information to make decisions, leading to improvements.

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Chapter 1

Introduction

Chapter 1: Introduction

In an age where technology continually reshapes how we interact with the world around us, the convergence of Augmented Reality (AR) and event management has emerged as a game changing force. Our project is an exciting venture into this dynamic realm, bridging the gap between digital innovation and real world event planning. The heart of our endeavor lies in the fusion of a web based platform brimming with meticulously crafted 3D model templates and a companion Android application that transforms these digital designs into tangible, augmented reality experiences. The result? An innovative solution that revolutionizes event management by allowing users to envision and personalize their events like never before.

1.1. Background

1. Rapid Technological Advancements:

The project is situated in an era marked by rapid advancements in technology, particularly in the fields of Augmented Reality and mobile applications.

The increasing prevalence of smartphones and the growing sophistication of AR technologies have created a fertile ground for innovative solutions.

2. Emergence of Augmented Reality:

Augmented Reality, the overlay of digital information onto the physical world, has gained prominence in various industries, ranging from gaming to education and now event management.

The ability of AR to seamlessly integrate digital elements into the real world opens up new possibilities for interactive and immersive experiences.

3. Evolution of Event Management:

Traditional event planning involves 2D representations and imagination. The project recognizes the need for a paradigm shift, offering a solution that allows users to move beyond imagination into a more tangible and personalized event planning experience.

As events become more complex and diverse, the demand for innovative tools to

streamline the planning process has grown.

4. Web Based Platform with 3D Models:

The project centers around a web based platform that serves as a hub for meticulously crafted 3D model templates. These templates are designed to cover a wide range of event elements, from venue layouts to decor and entertainment.

5. Companion Android Application:

To bridge the gap between the virtual and physical worlds, a companion Android application has been developed. This application brings the digital designs from the web platform into the real world using AR technology.

The mobile application provides a user friendly interface for users to interact with and experience their event designs in an augmented reality environment.

6. Innovative Event Management Solution:

The ultimate goal of the project is to revolutionize event management by offering an innovative solution that empowers users to not only plan but also visualize and personalize their events in ways previously unattainable.

The integration of AR technology transforms event planning from a static, 2D process into a dynamic and immersive experience.

In summary, the background of this project is rooted in the intersection of technological progress, the rise of Augmented Reality, and the evolving landscape of event management. The project aims to reshape how people conceptualize and execute events in the modern age.

1.2. Motivations and Challenges

1. Enhancing User Engagement:

The project is motivated by the desire to enhance user engagement in the event planning process. By offering a visually immersive experience through augmented reality, users are more likely to actively participate in designing and personalizing their

events.

2. Innovative Event Planning:

Motivated by a commitment to innovation, the project seeks to transform traditional event planning methods. The use of 3D models and AR technology provides a novel and creative approach, allowing users to go beyond conventional planning tools.

3. Personalization and Customization:

Recognizing the increasing demand for personalized experiences, the project aims to empower users to customize every aspect of their events. the platform provides a level of personalization that goes beyond what traditional tools offer.

4. Adaptability to Diverse Events:

The motivation includes catering to a wide range of events, from weddings to corporate functions. The 3D model templates are crafted with diversity in mind, allowing users to adapt the technology to various event types and sizes.

Challenges:

1. Technical Complexity:

The integration of a web based platform, 3D modeling, and AR technology poses technical challenges. Experience across different devices and platforms is a priority.

2. User Adoption:

Convincing users to adopt a new and innovative approach to event planning may be a challenge. Overcoming the initial learning curve and demonstrating the value of the AR enhanced process are crucial for widespread adoption.

3. Content Diversity:

Creating a diverse library of 3D model templates that caters to a broad spectrum of events requires ongoing effort. Balancing quality and quantity while continuously updating the content library poses a challenge.

4. AR Hardware Limitations:

The project must contend with the limitations of AR hardware on various Android devices. Ensuring a consistent and high quality AR experience across different smartphones and tablets is a challenge. Balancing quality and quantity while their data is a significant concern

5. Data Security and Privacy:

As users engage with the web platform to plan their events, ensuring the security and privacy of their data is a significant concern. Implementing robust measures to protect user information is a challenge in the digital landscape.

1.3. Goals and Objectives

1. Revolutionize Event Planning:

Goal: To revolutionize the traditional event planning process by introducing a dynamic, augmented reality driven platform.

Objective: Achieve widespread recognition and adoption as a go to solution for modern and immersive event planning.

2. Enhance User Creativity:

Goal: Empower users to unleash their creativity and personalize every aspect of their events.

Objective: Provide a diverse and constantly expanding library of high quality 3D model templates to cater to a wide range of event types.

3. Improve Efficiency in Planning:

Goal: Streamline the event planning process to save time and effort for users.

Objective: Ensure a user friendly interface that allows for intuitive navigation and seamless collaboration, reducing the complexity of planning tasks.

4. Ensure Cross Platform Compatibility:

Goal: Provide a consistent and high quality augmented reality experience across various Android devices.

Objective: Optimize the companion Android application to perform effectively on a

wide range of smartphones and tablets, addressing hardware and software variations.

5. Prioritize Data Security and Privacy:

Goal: Safeguard user data and privacy throughout the event planning process.

Objective: Implement robust security measures, encryption protocols, and transparent privacy policies to instill confidence in users regarding the protection of their information.

Objectives:

1. Develop and Expand 3D Model Library:

Objective: Regularly update and expand the library of 3D model templates to cover a comprehensive array of event elements and styles.

2. User Education and Onboarding:

Objective: Create user friendly guides, tutorials, and tooltips within the platform to facilitate a smooth onboarding process and educate users on the full potential of the AR enhanced event planning.

3. Continuous User Feedback Integration:

Objective: Establish channels for users to provide feedback, and implement iterative updates based on user suggestions to enhance the platform's features and usability.

4. Strategic Marketing and Partnerships:

Objective: Develop and execute a comprehensive marketing strategy to promote the platform. Explore partnerships with event planning businesses, influencers, and technology publications to increase visibility.

5. Performance Optimization:

Objective: Conduct regular performance assessments and optimizations to ensure the platform and companion application operate smoothly, even as new features are introduced.

6. Community Building:

Objective: Foster a community of users who share their experiences, tips, and designs.

Encourage user generated content and collaborations within the platform.

7. Adaptability to Technological Advancements:

Objective: Stay abreast of technological advancements in AR, web development, and mobile technologies. Integrate relevant updates to enhance the platform's capabilities and maintain a competitive edge.

1.4. Literature Review/Existing Solutions

Augmented Reality (AR) has been increasingly integrated into event management to enhance participant engagement and overall event experiences. Existing solutions leverage AR to provide interactive and immersive elements during events. These solutions often include AR companion applications that attendees can use on their mobile devices or AR glasses to access real-time information, navigate event venues, and engage with interactive content. Furthermore, some platforms offer AR features for event organizers, enabling them to visualize and customize event layouts in real-time, streamlining the planning process. Notable examples include AR-based wayfinding tools, virtual event walkthroughs, and interactive AR elements that enhance the overall atmosphere of the event. These solutions showcase the potential of AR in transforming traditional event management practices and creating dynamic and engaging experiences for both organizers and participants.

1.5. Gap Analysis

1. Current State:

Observation: Traditional event planning tools predominantly rely on 2D representations and lack immersive features.

Opportunity: There is a gap in the market for a more dynamic and visually engaging event planning solution that leverages Augmented Reality.

2. Limited Personalization:

Observation: Existing event planning platforms may offer customization but lack the

depth of personalization that modern users seek.

Opportunity: Bridging the gap by providing a platform that enables users to visualize and customize every detail of their events through AR enhanced experiences.

3. Technology Integration:

Observation: Many event planning tools are yet to fully embrace the potential of Augmented Reality and 3D modeling.

Opportunity: Introducing a platform that seamlessly integrates these technologies, offering a more interactive and immersive planning experience.

4. Cross Platform AR Challenges:

Observation: AR experiences on Android devices can vary significantly due to hardware and software differences.

Opportunity: Addressing this gap by optimizing the companion Android application to ensure a consistent and high quality AR experience across a wide range of devices.

5. Limited User Engagement:

Observation: Traditional event planning tools may lack features that actively engage users throughout the planning process.

Opportunity: Filling this gap by offering a platform that not only streamlines the planning process but also enhances user engagement through creativity and visualization.

6. Privacy Concerns:

Observation: With the increasing emphasis on data security and privacy, some event planning platforms may not adequately address these concerns.

Opportunity: Addressing this gap by prioritizing and implementing robust security measures to ensure user data is safeguarded throughout the planning journey.

7. Educational Resources:

Observation: Users may face a learning curve when adapting to new, innovative event planning approaches.

Opportunity: Providing comprehensive educational resources within the platform to guide users through the AR enhanced planning process, closing the knowledge gap.

8. Diversity in 3D Models:

Observation: Existing platforms may lack a diverse and constantly updated library of 3D models for various event elements.

Opportunity: Continuously expanding and diversifying the library to cater to a broad spectrum of events and user preferences.

9. Community Building:

Observation: Users often lack a sense of community and collaboration within traditional event planning tools.

Opportunity: Fostering a community within the platform where users can share ideas, collaborate, and inspire each other, addressing the social gap in the event planning process.

Strategic Actions

1. Innovative Feature Development:

Action: Invest in the development of innovative features that differentiate the platform, such as new AR interactions, collaborative planning tools, and advanced personalization options.

2. User Friendly Onboarding:

Action: Enhance onboarding processes by providing intuitive guides, tutorials, and tooltips to help users quickly adapt to the AR enhanced event planning experience.

3. Continuous Improvement Based on Feedback:

Action: Establish feedback loops with users, actively seek their opinions, and implement iterative updates to address any usability issues and enhance features.

4. Strategic Partnerships:

Action: Forge partnerships with event planning professionals, influencers, and technology experts to expand visibility, gain insights, and improve the platform's

market position.

5. Comprehensive Security Measures:

Action: Invest in state of the art security protocols, regularly update privacy policies, and communicate transparently with users to build trust in the platform's data security.

6. Optimization for Device Diversity:

Action: Regularly test and optimize the companion Android application to ensure a seamless AR experience across a wide range of devices, addressing the challenges posed by device diversity.

7. Educational Content Creation:

Action: Develop and regularly update educational content within the platform, including video tutorials, articles, and FAQs, to assist users in understanding and maximizing the platform's capabilities.

8. Community Engagement Initiatives:

Action: Implement features that facilitate user interaction, collaboration, and content sharing within the platform. Host events, challenges, and forums to build a sense of community among users.

1.6. Proposed Solution

1. Comprehensive Augmented Reality Event Planning Platform:

Description: Develop a comprehensive web based platform that serves as a hub for event planning. The platform will feature a diverse and expanding library of meticulously crafted 3D model templates for various event elements.

2. Interactive 3D Modeling:

Description: Implement an intuitive 3D modeling interface that allows users to interactively design and customize their events. Users can drag and drop 3D models, adjust dimensions, and experiment with different layouts.

3. AR Enhanced Companion Android Application:

Description: Develop a companion Android application that seamlessly integrates with

the web platform. The application uses Augmented Reality to bring the 3D event designs into the real world, allowing users to visualize their plans in their physical space.

4. Personalization Features:

Description: Offer robust personalization features, allowing users to customize everything from venue layouts and decor to seating arrangements and lighting. The goal is to empower users to create truly unique and tailored event experiences.

5. User Friendly Onboarding and Tutorials:

Description: Implement a user friendly onboarding process within both the web platform and the mobile application. Provide step by step tutorials, tooltips, and guides to help users quickly understand and make the most of the platform's features.

6. Continuous Content Updates:

Description: Commit to regularly updating the 3D model library to ensure diversity and relevance. Introduce new models based on user feedback, emerging trends, and seasonal themes to keep the content fresh and appealing.

7. Cross Platform Optimization:

Description: Optimize the companion Android application for a wide range of devices, addressing hardware and software variations. Ensure a consistent and high quality AR experience, regardless of the user's smartphone or tablet.

8. Security and Privacy Measures:

Description: Implement robust security measures, including encryption protocols and secure user authentication, to protect user data throughout the event planning process. Clearly communicate the platform's commitment to data security and privacy.

9. Community Building Features:

Description: Introduce community building features within the platform, such as forums, user generated content sharing, and collaborative planning spaces. Encourage users to share their event designs, tips, and experiences.

10. Feedback Integration System:

Description: Establish a feedback system within the platform, allowing users to provide input on features, report issues, and suggest improvements. Actively incorporate user feedback into iterative updates to enhance the platform continuously.

11. Strategic Marketing Campaigns:

Description: Launch strategic marketing campaigns to create awareness about the platform. Collaborate with influencers in the event planning and tech industries, leverage social media, and utilize targeted advertising to reach the intended audience.

12. Educational Content Hub:

Description: Create and maintain an educational content hub within the platform, featuring video tutorials, articles, and FAQs. Ensure that users have access to resources that help them maximize the platform's capabilities.

Key Outcomes:

1. Immersive Event Planning Experience:

Users can plan and visualize their events in an immersive and dynamic way, thanks to the integration of Augmented Reality and interactive 3D modeling.

2. High User Engagement:

The platform encourages active user engagement through personalized and interactive features, fostering a community of event planners who share ideas and experiences.

3. User Empowerment:

Users feel empowered to unleash their creativity and personalize every detail of their events, resulting in truly unique and memorable experiences.

4. Consistent AR Experience:

The companion Android application delivers a consistent and high quality AR experience across a wide range of devices, ensuring user satisfaction.

5. Security and Privacy Assurance:

The platform prioritizes user data security and privacy, instilling confidence in users that their information is handled with the utmost care.

6. Ongoing Innovation and Community Collaboration:

Continuous content updates, feature enhancements based on user feedback, and a thriving community contribute to the platform's ongoing innovation and relevance in the dynamic landscape of event planning.

1.7. Project Plan

2. **Start Date:** 8/21/2023

3. **End Date:** 4/15/2024

1. Initiation Phase (Month 1) Activities:

- Define project scope, objectives, and success criteria.
- Assemble project team and assign roles.
- Conduct market research and competitor analysis.
- Develop a detailed project plan, including timelines and milestones.
- Secure necessary resources and budget approvals.

2. Planning and Design Phase (Month 2):

Activities:

- Detailed design of the web based platform and mobile application.
- Development of 3D model templates for the platform's library.
- Define user personas and conduct user experience (UX) testing.
- Finalize the feature set and prioritize functionalities.
- Develop a comprehensive marketing and launch strategy.

3. Development Phase (Month 3):

Activities:

- Implement the web based platform's core architecture and functionality.
- Develop the companion Android application with AR integration.
- Create an intuitive 3D modeling interface for users.

- Implement personalization features and the feedback system.
- Conduct iterative testing and debugging.

4. Testing and Quality Assurance (Month 6):

Activities:

- Conduct thorough testing of the web platform and mobile application.
- Perform compatibility testing across various Android devices.
- Implement user feedback from testing phases.
- Address security and privacy concerns with rigorous testing.
- Optimize performance for a seamless user experience.

5. Launch and Marketing (Month 8):

Activities:

- Execute the strategic marketing plan.
- Launch the web based platform and Android application.
- Monitor user feedback and address any immediate concerns.
- Engage with influencers and media for initial reviews.
- Gather user testimonials for marketing materials.

1.8. Work Breakdown Structure

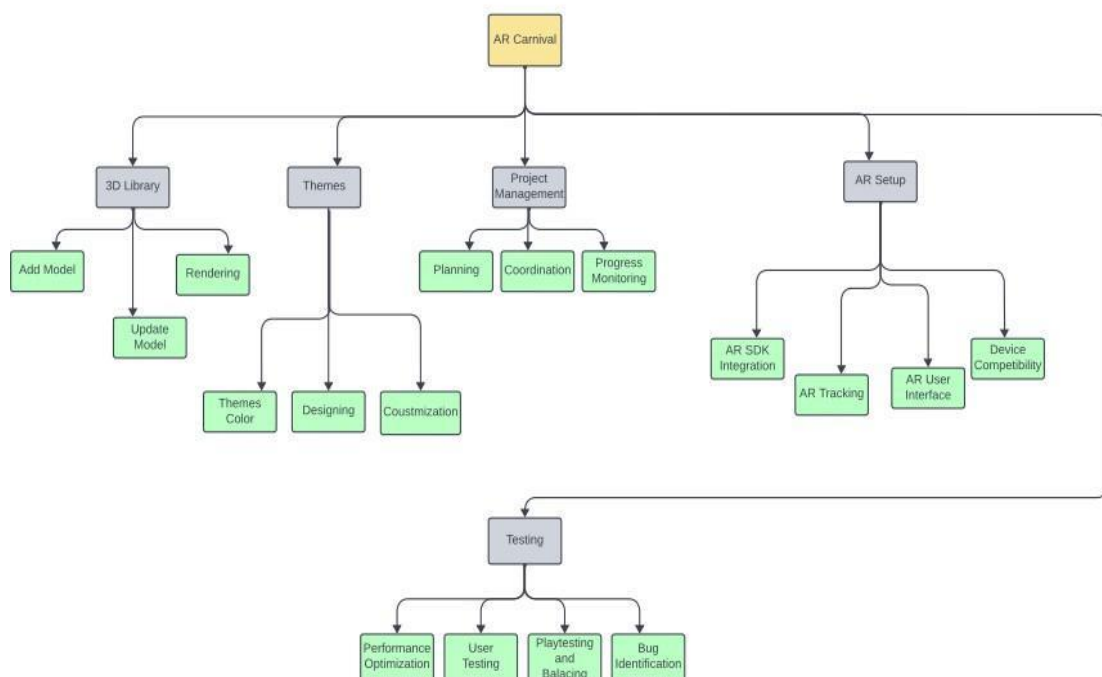


Figure 1 Work BREAKDOWN STRUCTURE

1.9. Roles & Responsibility Matrix

The purpose of roles & responsibility matrix is to identify who will do what.

WBS #	WBS Deliverable	Activity #	Activity to Complete the Deliverable	Duration (# of Days)	Responsible Team Member(s) & Role(s)
1	Project Initiation	1.1	Kaneez Zahra (Resource Coordinator)	5	Fahim (Project Manager)
2	<i>Project Initiation</i>	1.2	Kaneez Zahra (Resource Coordinator)	3	<i>Ammar Aziz (Project Planner)</i>
3	<i>Project Initiation</i>	1.3	Kaneez Zahra (Resource Coordinator)	7	Kaneez Zahra (Resource Coordinator)

4	<i>Project Initiation</i>	1.4	Kaneez Zahra (Resource Coordinator)	7	Fahim (Project Manager)
5	<i>Research and Analysis</i>	2.1	Kaneez Zahra (Resource Coordinator)	7	<i>Ammar Aziz (Project Planner)</i>
6	<i>Research and Analysis</i>	2.2	Kaneez Zahra (Resource Coordinator)	7	Kaneez Zahra (Resource Coordinator)
7	Research and Analysis	2.3	Kaneez Zahra (Resource Coordinator)	7	Fahim (Project Manager)
8	Research and Analysis	2.4	Kaneez Zahra (Resource Coordinator)	7	<i>Ammar Aziz (Project Planner)</i>
9	Design Phase	3.1	Kaneez Zahra (Resource Coordinator)	7	Kaneez Zahra (Resource Coordinator)
10	Design Phase	3.2	Kaneez Zahra (Resource Coordinator)	7	Fahim (Project Manager)
11	Design Phase	3.3		7	<i>Ammar Aziz (Project Planner)</i>
12	<i>Deployment</i>	4.1	Kaneez Zahra (Resource Coordinator)	7	Kaneez Zahra (Resource Coordinator)
13	<i>Deployment</i>	4.2	Kaneez Zahra (Resource Coordinator)	7	Fahim (Project Manager)

1.10. Gantt Chart

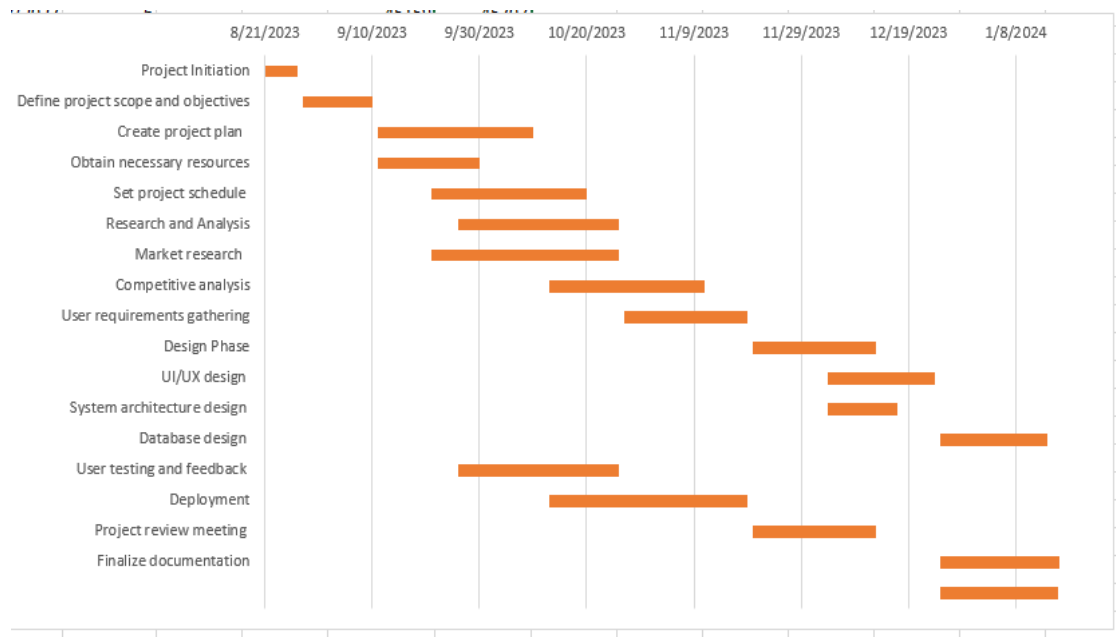


Figure 2 Gantt Chart

1.11. Empathy Map

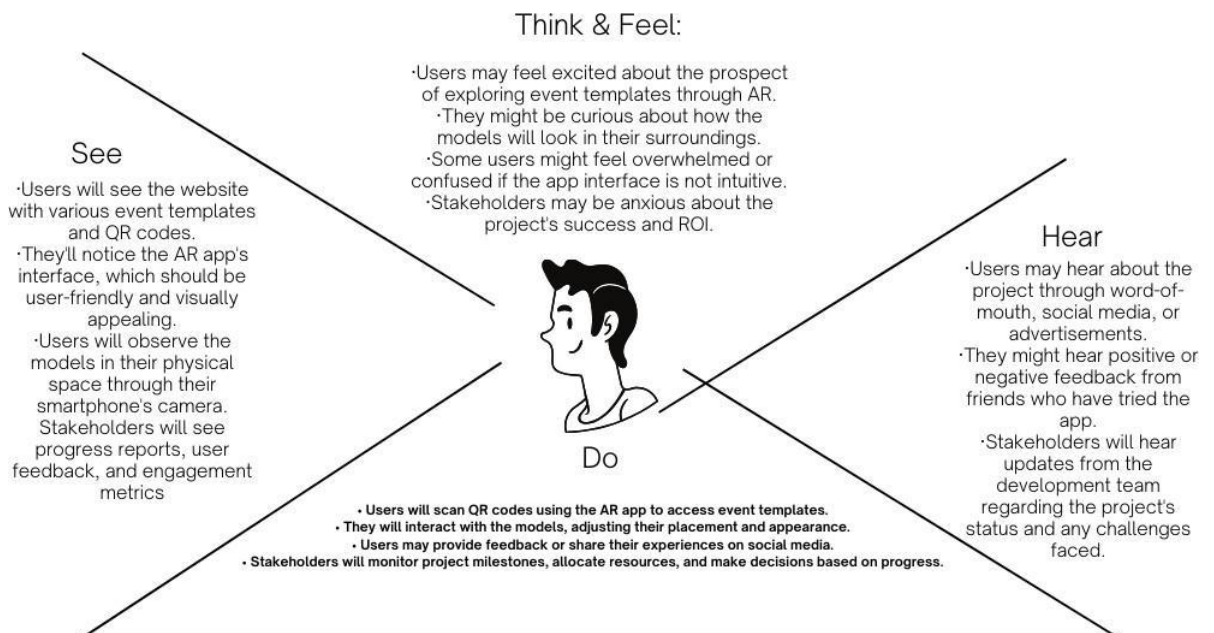


Figure 3 Empathy Map

Chapter 2

Software Requirement Specifications

Chapter 2: Software Requirement Specifications

2.1. Introduction

Development of an innovative Augmented Reality (AR) Event Planning Platform. This platform aims to reshape the traditional approach to event planning by seamlessly integrating 3D modeling and Augmented Reality technologies. The goal is to empower users to envision and personalize their events through a dynamic and immersive digital

2.2. Purpose

Development of an innovative Augmented Reality (AR) Event Planning Platform. This platform aims to reshape the traditional approach to event planning by seamlessly integrating 3D modeling and Augmented Reality technologies. The goal is to empower users to envision and personalize their events through a dynamic and immersive digital

2.3. Document Conventions

- This SRS document follows standardized conventions for clarity and consistency:
- Fonts and Formatting:
 - Standard font for requirement statements, with bold or italics for emphasis.
 - Monospaced font for code snippets and technical terms.
- Priority Assignment:
 - Priorities assigned at both higher and detailed levels.
 - Higher-level priorities assumed to apply to associated detailed requirements.
- Section Organization:
 - Document organized with standardized headings and subheadings for easy navigation.
 - These conventions aim to maintain a consistent and comprehensible format, ensuring clear interpretation of software requirements and priorities by stakeholders.

2.4. Intended Audience and Reading Suggestions

This Software Requirements Specifications (SRS) document is designed for various stakeholders involved in the [Product Name] project. The intended audience includes developers, project managers, marketing staff, users, testers, and documentation

writers.

Reading Suggestions:

Overview Sections:

For All Readers: Start with the introduction and executive summary to gain an overall understanding of the project.

Developers:

Detailed Requirements: Developers should focus on the detailed requirements section for in-depth technical insights.

Methods and Data: Pay attention to the methodology and data specifications for implementation details.

Project Managers:

Project Scope: Understand the scope and objectives outlined in the document.

Milestones and Timeline: Refer to the project plan and timeline for scheduling considerations.

Marketing Staff:

Product Scope and Features: Focus on sections detailing the product scope and features to grasp marketable aspects.

User Experience: Review customization options and user-centric features.

Users:

User Interface Design: Understand the user interface design for an overview of the system's look and feel.

Customization Options: Explore sections on customization for tailoring the product to specific needs.

Testers:

Quality Assurance: Dive into the quality assurance section for testing procedures and requirements.

User Acceptance Testing: Focus on the user acceptance testing section for end-user

validation.

Documentation Writers:

Documentation Section: Refer to the documentation and training section for guidelines on creating user manuals and guides.

Appendices: Explore appendices for supplementary information and data.

2.5. Product Scope

Description:

AR Carnival is a revolutionary software for effortless digital event planning. Users input parameters like walls.

Objectives:

Efficiency: Ar Carnival automates manual event planning, saving significant time.

Consistency: Ensures a professional look for event view consistently.

Flexibility: Users can customize themes to meet specific needs and require.

Overall Description Product Perspective Context and Origin:

The Augmented Reality Event Planning Platform is a standalone product developed to redefine and enhance the process of planning and visualizing events. It is not a replacement for existing systems but a pioneering solution that leverages technologies to offer a unique user experience in event management.

System Components:

The major components of the overall system include:

1. Web Based Platform:

The core interface where users can access event planning tools, 3D modeling features, and customization options.

2. Companion Android Application:

An extension of the platform, providing an Augmented Reality experience for users to

visualize their event designs in the real world.

3. User Friendly Onboarding and Tutorials:

Educational components to assist users in navigating and utilizing the platform effectively.

4. Testing and Quality Assurance:

Ensures the reliability, security, and performance of the entire system.

5. Community Building Features:

Components that facilitate user interaction, collaboration, and content sharing within the platform.

6. Security and Privacy Measures:

Components responsible for implementing robust security protocols to protect user data.

User Classes and Characteristics

1 Regular Users:

- **Frequency of Use:** Frequent users engaged in daily slide creation tasks.
- **Product Functions:** Primarily utilize standard slide creation functions.
- **Technical Expertise:** Varied technical backgrounds, ranging from basic to intermediate.
- **Security/Privilege Levels:** Standard user privileges without elevated access.
- **Educational Level/Experience:** Diverse educational backgrounds and experience levels.

2. Power Users:

- **Frequency of Use:** Intensive users heavily reliant on advanced features.
- **Product Functions:** Leverage a wide array of advanced customization options.
- **Technical Expertise:** High technical proficiency with in-depth product knowledge.
- **Security/Privilege Levels:** Elevated privileges for customization and system adjustments.
- **Educational Level/Experience:** Typically possess advanced education or

professional experience in related fields.

3. Administrators:

- **Frequency of Use:** Moderate usage for system management and oversight.
- **Product Functions:** Primarily focused on system administration and user management.
- **Technical Expertise:** High technical proficiency with expertise in system management.
- **Security/Privilege Levels:** Highest level of access for system-wide configuration.
- **Educational Level/Experience:** Advanced education and experience in system administration.

4. Collaborators:

- **Frequency of Use:** Periodic users collaborating on joint presentations.
- **Product Functions:** Utilize collaborative features and shared editing capabilities.
- **Technical Expertise:** Varied technical backgrounds, with a focus on collaboration tools.
- **Security/Privilege Levels:** Access limited to collaborative functionalities.
- **Educational Level/Experience:** Diverse educational backgrounds, with a focus on collaborative projects.

Operating Environment

Hardware Requirements:

1. Web Based Platform:

Standard web browsers such as Google Chrome, Mozilla Firefox, Safari, or Microsoft Edge. Stable internet connection for accessing platform features and 3D model libraries.

2. Companion Android Application:

Android devices with a minimum of Android 8.0 (Oreo) or higher.

Devices with sufficient processing power and RAM for smooth AR rendering.

Software Requirements:

1. Web Based Platform:

Compatibility with major operating systems: Windows, macOS, Linux. Browser support for WebGL technology.

JavaScript must be enabled.

2. Companion Android Application:

Android operating system version 8.0 (Oreo) or higher.

Installation of the application from the Google Play Store or an authorized distribution channel.

Network Requirements:

Web Based Platform:

A reliable internet connection for accessing and utilizing online features.

High speed internet recommended for seamless 3D model loading and interaction.

Companion Android Application:

Internet connectivity for initial installation, updates, and synchronization of event data.

Mobile data or Wi Fi connectivity for AR functionality.

Additional Considerations:

1. Web Based Platform:

Browser settings must allow for the use of cookies and local storage.

Users are encouraged to update their browsers to the latest versions for optimal performance.

2. Companion Android Application:

- Users should grant necessary permissions for camera access, storage, and location for AR features.
- Regular updates from the Google Play Store to ensure compatibility with the

latest Android versions.

Constraints:

1. Web Based Platform:

Performance may vary based on the user's internet connection and device capabilities. Some advanced features may require Web GL and may not be supported on older browsers.

2. Companion Android Application:

AR functionality is dependent on the capabilities of the user's Android device. The availability of AR Core support on the device for optimal AR experiences.

2.6. Design and Implementation Constraints

1. Device Compatibility:

- The Augmented Reality functionality in the companion Android application is dependent on the capabilities of the user's device.
- AR experiences may vary based on the availability of ARCore support on Android devices.
- Performance may vary, and some advanced features may be constrained by the capabilities of the chosen browser.

2. 3D Model Library Integration:

- Integration with third party 3D model libraries may be subject to the terms and conditions of the respective libraries.
- Availability and updates of 3D models are contingent upon agreements with content providers.

Implementation Constraints:

1. Technology Stack:

The choice of technologies for both the web based platform and Android application is constrained by compatibility, industry standards, and development

team expertise.

2. Budgetary and Time Constraints:

- Development activities are constrained by budget limitations and the predefined project timeline.
- The availability of resources, including human resources and technological infrastructure, may impact implementation.

Resource Constraints:

1. Human Resources:

- The availability of skilled developers, designers, and testers may impact the pace of implementation.
- Resource constraints may influence the depth and breadth of features implemented within the given timeframe.

2. Infrastructure:

Adequate server infrastructure and cloud services are necessary to support the web based platform's scalability and performance.

Compliance and Standards:

1. Legal and Regulatory Compliance:

The implementation must adhere to legal and regulatory standards, including data protection laws and guidelines.

Compliance with accessibility standards to ensure inclusivity for users with diverse needs.

2. Industry Standards:

- Adherence to industry standards for AR development and web application security.

Third Party Integrations:

1. External APIs and Libraries:

Integration with external APIs and libraries is subject to their terms of use and documentation.

Compatibility and updates of third party tools may influence the implementation.

Consideration for Future Enhancements:

1. Scalability:

The initial design must allow for future scalability to accommodate additional features and a growing user base.

2. Technology Advancements:

The platform should be designed with flexibility to adopt emerging technologies and industry best practices in the future.

Assumptions and Dependencies

1. Device Compatibility:

- Assumption: It is assumed that the majority of event participants will have access to AR- capable devices, such as smartphones or AR glasses.
- Dependency: The success of the AR features relies on participants' devices supporting the necessary AR functionalities.

2. Network Infrastructure:

- Assumption: The availability of a reliable network infrastructure, including both cellular .
- Dependency: The platform's effectiveness is dependent on a stable network environment, and potential disruptions may impact user experience.

3. AR Development Framework:

- Assumption: The project assumes the availability and compatibility of suitable AR development frameworks or SDKs for implementing augmented reality features.
- Dependency: The project's timeline and success are contingent on the continued support and functionality of the chosen AR development tools.

7. Data Security and Privacy Compliance:

- Assumption: The project assumes compliance with data security and privacy

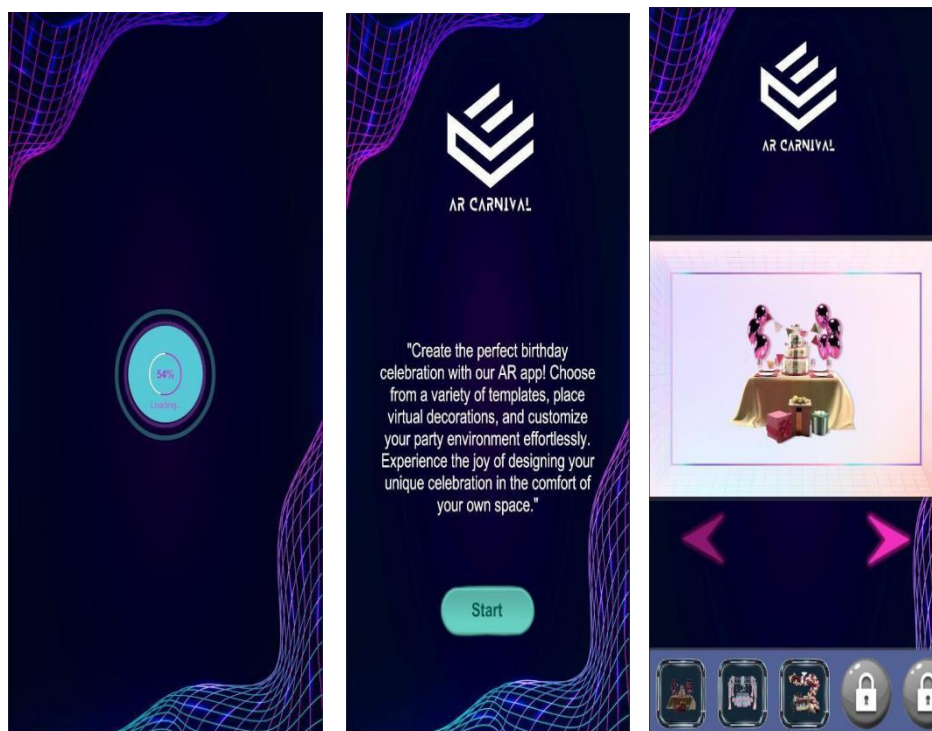
regulations, considering the sensitive nature of user and event data.

- Dependency: The success of the project is dependent on maintaining high standards of data security and privacy, adhering to relevant regulations.

2.7. External Interface Requirements

User Interfaces

Figure 4 User Interface



Hardware Interfaces

Augmented Reality Event Planning Platform interfaces with a variety of hardware components to deliver its immersive functionalities. Participants primarily engage with the platform using AR-capable devices, including smartphones or AR glasses, leveraging their cameras and sensors for AR overlays. Event organizers interact with the platform through standard computing

devices, such as laptops or desktop computers, utilizing web browsers for the

dashboard interface. The system assumes compatibility with prevalent network hardware, including Wi-Fi routers and cellular networks, to ensure seamless communication and data exchange between users and the platform. Additionally, the platform relies on the internal hardware of these devices, such as processors and memory, to support the rendering of 3D models and AR elements. These hardware interfaces collectively contribute to delivering a dynamic and interactive augmented reality experience for both organizers and participants during event planning and execution.

2.8. Software Interfaces

Logical Characteristics:

1. Supported Devices:

The web based platform is designed to be accessed through standard web browsers on various devices, including desktops, laptops, tablets, and smartphones.

Compatibility with major browsers such as Google Chrome, Mozilla Firefox, Safari, and Microsoft Edge.

Data and Control Interactions:

1. Data Transfer:

Communication between the web based platform and the server occurs over standard **HTTP/HTTPS protocols.**

Data transfer includes user inputs, 3D model information, and configuration settings.

1. Supported Android Devices:

The Android application is compatible with devices running Android OS version 8.0 (Oreo) or higher.

Physical Characteristics:

1. Device Requirements:

- Devices with sufficient processing power, RAM, and camera capabilities to support AR rendering.

- Availability of internet connectivity for initial installation, updates, and AR data synchronization.

Data and Control Interactions:

1. AR Core Integration:

The application interfaces with AR Core for Augmented Reality features.

Data transfer includes AR data synchronization, user inputs, and application configuration.

1. Web Android Interface:

Both platforms synchronize event designs and configurations.

Communication may involve the transfer of 3D model data, user preferences, and event details.

2.9. Communications Interfaces

Web Based Platform:

1. Communication Protocols:

- The web based platform utilizes HTTP/HTTPS for communication between the user's web browser and the server.
- Web Socket communication is employed for real time updates, ensuring responsive interactions during event planning.

2. Data Transfer and Formats:

- Data transfer involves JSON (JavaScript Object Notation) for structured data interchange.
- Images and other media files are transferred using standard file formats compatible with web browsers.

3. User Authentication:

- Secure user authentication is implemented using HTTPS to protect user credentials during login.
- OAuth 2.0 or a similar authentication mechanism may be employed for third

party integrations.

Companion Android Application:

1. Communication Protocols:

- The Android application uses HTTP/HTTPS for general communication with the server.
- AR data synchronization may involve additional protocols for efficient transfer of AR related data.

2.10. System Features

Intuitive Interface:

Functionality: Incorporate user-friendly GUI and responsive design.

Seamless Collaboration:

Functionality: Enable simultaneous editing, comments, and version history.

Customization Options:

Functionality: Tailor settings for preferences, templates, and styles.

Dashboard Overview:

Functionality: Centralized dashboard for presentations and updates.

Integration with External Tools:

Functionality: Compatible with office suites and design tools.

Data Security and Access Control:

Functionality: Implement security protocols and access controls.

Notification System:

Functionality: E-mail notifications for shared presentation updates.

2.11. User Authentication

Description and Priority Description:

User Authentication is the process of verifying the identity of users accessing the Augmented Reality Event Planning Platform. This feature ensures secure access to

personalized event planning functionalities, protecting user data and interactions.

Justification:

User Authentication is a fundamental component with a high priority as it establishes the foundation for data security and privacy. A secure authentication process is essential for building user trust and ensuring that only authorized individuals can access and modify their event plans. While the implementation may incur some costs and user inconvenience, the benefits in terms of security and user confidence justify the high priority rating. The risk of not implementing robust authentication measures is substantial, given the sensitivity of user data in event planning scenarios.

5.1.1.1. Stimulus/Response Sequences Sequence 1: User Login

Stimulus:

User navigates to the platform's login page. User enters their username and password. User clicks the "Login" button.

Response:

System verifies the user's credentials. If credentials are valid:

User is successfully logged in. Redirected to the platform's dashboard. If credentials are invalid:

System displays an error message.

User is prompted to reenter valid credentials. Sequence 2: Multi Factor

Authentication **Stimulus:**

1. User successfully enters valid credentials during login.
2. The system recognizes the need for multi factor authentication.
3. User is prompted to enter a code sent to their registered email or phone.

Response:

- System generates and sends a unique code to the user's registered email or phone.

- User receives the code and enters it into the platform.
- If the code is correct:
- Multi factor authentication is successful.
- User is logged in.
- If the code is incorrect:
- System displays an error message.
- User is prompted to enter the correct code.

Sequence 3: Password Reset Stimulus:

1. User clicks on the "Forgot Password" link on the login page.
2. User provides the necessary information for identity verification.

Response:

1. System validates the provided information.

1. If information is valid:
2. User receives a password reset link via email.
3. User clicks the link to reset the password.
4. User sets a new password.
5. Password reset is successful.
6. If information is invalid:
7. System displays an error message.

User is prompted to provide correct information.

Sequence 4: User Logout Stimulus:

1. User clicks on the "Logout" button within the platform.

Response:

1. System logs the user out.
2. User is redirected to the login page.

3. User receives a confirmation message that they have been successfully logged out.

Sequence 5: Account Logout Stimulus:

1. User enters incorrect credentials multiple times, exceeding the allowed limit.

Response:

1. System detects multiple failed login attempts.
2. User account is temporarily locked for security reasons.
3. System displays a message notifying the user of the account logout.
4. User is prompted to follow the account recovery process.

Functional Requirements

REQ.SF1.1: The system must provide a secure and user friendly login mechanism, allowing users to enter valid credentials.

REQ.SF1.2: Invalid login attempts must be appropriately handled, providing clear error messages to users and preventing multiple consecutive unsuccessful attempts.

REQ.SF1.3: The system should support multi factor authentication for an additional layer of security.

REQ.SF1.4: Users must be able to reset their passwords securely in case of forgotten credentials.

2.12. 3D Model Library

2.1.1 Description and Priority

The 3D Model Library is a comprehensive collection of meticulously crafted 3D models that users can utilize in designing and customizing event venues within the platform.

Priority: High

Stimulus/Response Sequences

User accesses the 3D Model Library section.

User searches for 3D models using filters or keywords.

Response Sequences

System displays a grid or list of available 3D models. User clicks on a specific model for detailed information.

Stimulus:

User is in the venue customization interface. User selects a 3D model from the library.

Response:

System adds the chosen 3D model to the user's event design. User can position, rotate, and scale the model within the venue. Sequence 3: User Feedback on 3D Models

Stimulus:

User interacts with a 3D model in the event design.

User provides feedback on the model's quality or suggests improvements.

Response:

System records user feedback for future enhancements.

If applicable, the system may prompt the user to rate or review the 3D model.

2.13. Functional Requirements

REQ.SF2.1: The system must provide a visually appealing and user friendly interface for browsing 3D models.

REQ.SF2.2: Users should be able to search and filter 3D models based on categories, themes, or keywords.

REQ.SF2.3: The system must display detailed information about each 3D model, including dimensions, texture quality, and any user reviews.

REQ.SF2.4: Users should have the ability to preview 3D models in a separate viewer before adding them to their event design.

2.14. Venue Layout Customization

Description: Venue Layout Customization allows users to design and customize event venues using the 3D models from the library, providing a flexible and interactive

environment for event planning.

Priority: High Component Ratings:

Benefit: 9/9 Empowers users to create personalized and immersive event experiences.

Penalty: 7/9 Resource intensive for real time rendering and user interactions.

Cost: 8/9 Development and maintenance of features related to real time rendering and customization.

Risk: 7/9 User satisfaction is closely tied to the ease and flexibility of venue layout customization.

Stimulus/Response Sequences

Sequence 1: Creating a New Event Venue Stimulus:

1. User initiates the creation of a new event.
2. User selects the option to customize the venue layout.

Response:

1. System provides a blank canvas representing the event venue.
2. User enters the customization interface to start designing the venue.

Sequence 2: Adding 3D Models to the Venue Stimulus:

1. User is in the venue customization interface.
2. User selects 3D models from the library to add to the venue.

Response:

1. System renders the selected 3D models within the venue.
2. User can drag, rotate, and scale the models to fit the desired layout.

Sequence 3: Adjusting Venue Elements Stimulus:

1. User clicks on existing elements within the venue (e.g., stage, seating).
2. User adjusts the position, size, or properties of the selected elements.

Response:

1. System reflects real time changes in the venue layout based on user adjustments.
2. User can preview the venue layout as modifications are made.

Functional Requirements

REQ.SF3.1: The system must provide a user friendly interface for creating and customizing event venues.

REQ.SF3.2: Users should have the ability to start with a blank canvas or choose from predefined venue templates.

REQ.SF3.3: The platform must support the addition of 3D models from the library to the venue.

REQ.SF3.4: Users should be able to manipulate the position, rotation, and scale of added 3D models within the venue.

2.15. Nonfunctional Requirements

2.5.1 Performance

REQ.NF1: The platform must load the main interface within 5 seconds of user initiation.

REQ.NF2: The Augmented Reality (AR) feature should provide a seamless experience with minimal latency, aiming for a rendering delay of less than 100 milliseconds.

REQ.NF3: The system should support a minimum of 10,000 concurrent users without significant degradation in performance.

2.5.2 Reliability

REQ.NF4: The platform must have an uptime of at least 99.9%, allowing for scheduled maintenance periods.

REQ.NF5: In the event of a system failure, the platform should recover within 30 minutes without data loss.

2.5.3 Security

REQ.NF6: User data, including personal information and event details, must be encrypted during transmission.

REQ.NF7: The system must implement secure user authentication and authorization

mechanisms.

2.5.4 Scalability

REQ.NF9: The platform architecture should be designed to easily scale horizontally to accommodate an increasing number of users and data.

REQ.NF10: The system should support a growing 3D model library, with the ability to add at least 100 new models per month.

2.5.5 Usability

REQ.NF11: The User Interface (UI) should adhere to established usability principles, ensuring an intuitive and user friendly experience.

REQ.NF12: The Augmented Reality (AR) feature should provide clear instructions and guidance for users unfamiliar with AR interactions.

2.16. Performance Requirements

2.15.1 Loading Time

REQ.NF1.1: The main interface of the platform must load within 5 seconds of user initiation.

Rationale: Users expect a responsive and efficient platform, and a quick loading time enhances the overall user experience.

2.15.2 Augmented Reality (AR) Rendering

REQ.NF2.1: The Augmented Reality (AR) feature should provide a seamless experience with a rendering delay of less than 100 milliseconds.

Rationale: A low rendering delay in AR interactions is crucial for creating an immersive and realistic experience for users.

2.15.3 Concurrent User Support

REQ.NF3.1: The system should support a minimum of 10,000 concurrent users without significant degradation in performance.

Rationale: As the platform is expected to host a large user base, the ability to handle concurrent users is critical for maintaining optimal performance during peak usage

times.

2.17. Safety Requirements

2.5.2.1 User Data Privacy

REQ.NF6.1: User data, including personal information and event details, must be encrypted during transmission.

Rationale: Ensuring the privacy and security of user data during transmission is vital to protect sensitive information from unauthorized access.

Secure Authentication and Authorization

Rationale: Secure authentication and authorization mechanisms are essential to prevent unauthorized access to user accounts and ensure the overall safety of the platform.

2.18. Security Requirements

2.5.3.1 Encryption of User Data

Rationale: Encrypting user data during transmission safeguards sensitive information and protects it from unauthorized access during communication.

2.5.3.2 Secure Authentication and Authorization

Rationale: Secure authentication and authorization are essential to prevent unauthorized access to the platform, ensuring that only authenticated and authorized users can access sensitive data.

2.19. Usability Requirements

2.20. User Interface Responsiveness

The User Interface (UI) should adhere to established usability principles, ensuring an intuitive and user friendly experience.

Rationale: A responsive and user friendly UI enhances user satisfaction and facilitates efficient interaction with the platform.

2.5.4.1 Augmented Reality (AR) Guidance

Rationale: Providing clear instructions and guidance ensures that users, including those new to AR technology, can easily navigate and interact with the AR features.

2.21. Reliability Requirements

System Uptime

Rationale: Reliable system uptime is crucial to ensure continuous availability and accessibility for users, meeting their expectations for a dependable platform.

2.22. Maintainability/Supportability Requirements

Modular System Architecture

Rationale: A modular architecture facilitates efficient maintenance and allows for the seamless incorporation of updates and new features without disrupting the entire system.

Documentation for Developers, Administrators, and Users

Rationale: Well documented resources assist developers, administrators, and users in understanding the platform, implementing changes, and utilizing features effectively.

2.23. Portability Requirements Cross Browser Compatibility

The platform should integrate seamlessly with commonly used web browsers, ensuring compatibility across different devices.

Rationale: Cross browser compatibility allows users to access the platform from various devices and browsers, enhancing accessibility and user reach.

Mobile Responsiveness

The platform's user interface should be responsive and optimized for mobile devices, providing a consistent and user friendly experience.

Rationale: Mobile responsiveness ensures that users can access and interact with the platform effectively, regardless of the device they are using.

2.24. Domain Requirements

Event Planning Standards

REQ.DOM1: The platform must adhere to industry best practices and standards for event planning, ensuring that users can seamlessly integrate the platform into their established event management workflows.

Event Customization Flexibility

REQ.DOM2: Users should have the flexibility to customize various aspects of their events, including themes, layouts, and interactive elements, through the platform's 3D model templates.

Chapter 3

Use Case Analysis

Chapter 3: Use Case Analysis

In one key use case, an event organizer leverages the platform to design a personalized event by selecting and customizing 3D model templates. The platform enables seamless integration of augmented reality (AR) elements, allowing the organizer to visualize and modify the event layout in real time. This not only enhances the planning experience but also provides a preview of the event's atmosphere. Additionally, the platform facilitates collaboration with vendors through a shared interface, streamlining communication and coordination.

3.1. Use Case Model

1. **Definition:** Present a high-level overview of the use case model, illustrating the primary actors, use cases, and their relationships.
2. **Components:**
 - **Actors:** Identify and define primary and secondary actors involved in interactions with the system.
 - **Use Cases:** List and briefly describe the major functionalities or processes offered by the system.

3.2. Use Cases Description

Use Case Name: Event Organizer Registration

Use Case ID: 01

Actor: User, Administrator

Pre-condition: User is not registered on the platform

Post-condition: User is successfully registered

Main Scenario:

3. User navigates to the registration page.
4. User provides required details, including name, email, and password.
5. System validates the entered information.
6. User account is created upon successful validation.

7. User receives a confirmation email.

Alternate Scenario:

1. User attempts to register with an existing email address.
2. System prompts the user to choose a different email address.
3. User follows the prompt to complete registration.

Use Case Name: Event Layout Customization

Use Case ID: 02

Actor: Event Organizer

Pre-condition: Event organizer is logged into the platform **Post-condition:** Event layout is successfully customized **Main Scenario:**

1. Event organizer accesses the platform and selects the "Customize Event Layout" option.
2. Organizer chooses a 3D model template for the event space.
3. Augmented reality (AR) elements are integrated into the selected template for visualization.
4. Organizer modifies the layout in real-time, adjusting the placement of stages, booths, and other elements.
5. Changes made are instantly reflected in the AR preview.
6. Organizer saves the customized layout for future reference.

Alternate Scenario:

1. Organizer encounters a technical issue preventing real-time modifications.
2. Platform provides troubleshooting guidance or allows the organizer to contact support.
3. Once the issue is resolved, the organizer continues with the customization process.

Use Case Name: Vendor Collaboration

Use Case ID: 03

Actor: Event Organizer, Vendor

Pre-condition: Event organizer has created an event and vendors are identified **Post-condition:** Collaboration between organizer and vendor is successful **Main Scenario:**

1. Event organizer invites vendors to collaborate through a shared interface.
2. Vendors receive the invitation and access the collaborative platform.
3. Organizer and vendors can communicate in real-time, sharing updates and details about the event.
4. Vendors upload relevant documents, such as booth designs or promotional materials.
5. Changes made by either party are instantly visible to the other.
6. Platform provides tools for seamless coordination, such as a shared calendar or task management system.

Alternate Scenario:

1. A vendor faces technical difficulties accessing the collaborative platform.
2. Event organizer provides assistance or alternative means for communication.
3. Collaboration resumes once technical issues are resolved.

Use Case Name: AR Companion App Usage

Use Case ID: 04

Actor: Event Participant

Pre-condition: Event participant has the AR companion app installed **Post-condition:** Participant successfully uses the AR app during the event **Main Scenario:**

1. Participant opens the AR companion app upon arriving at the event venue.
2. AR app scans the surroundings and displays relevant event information overlaid on the real world.
3. Participant navigates the venue using AR-guided directions.
4. Interactive elements, such as event schedules or vendor information, can be accessed through the app.

5. AR app provides real-time updates and notifications during the event.

Chapter 4

System Design

Chapter 4: System Design

The event management platform with augmented reality (AR) features is designed as a client- server application with a micro services architecture. The system components include a user interface for different user roles (organizers, vendors, participants), a backend server with micro services handling diverse functionalities, databases for structured and unstructured data, an AR module for layout customization, a collaboration module for communication between organizers and vendors, and an analytics module for data analysis.

For AR integration, the system uses AR Software Development Kits (SDKs) and a real-time rendering engine to visualize 3D models and AR elements during layout customization and participant interactions. Scalability and performance are achieved through load balancing, caching mechanisms, and Content Delivery Network (CDN) utilization.

4.1. Architecture Diagram

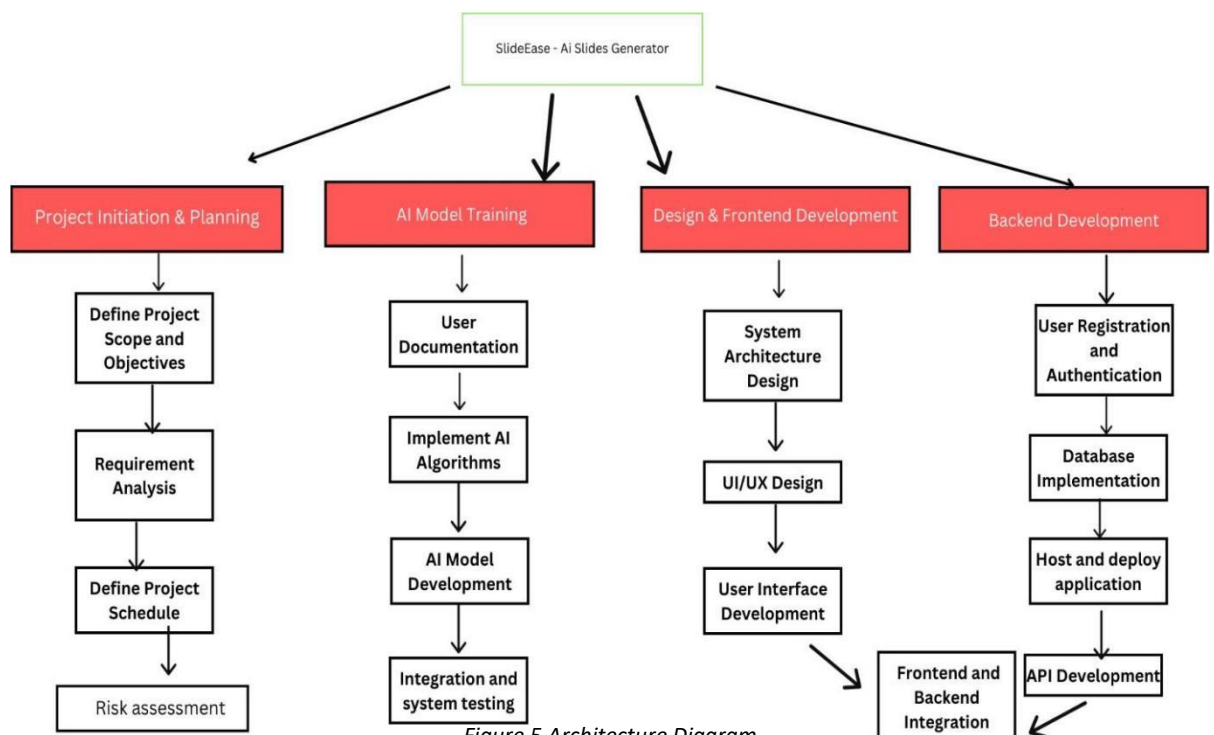


Figure 5 Architecture Diagram

4.2. Domain Model

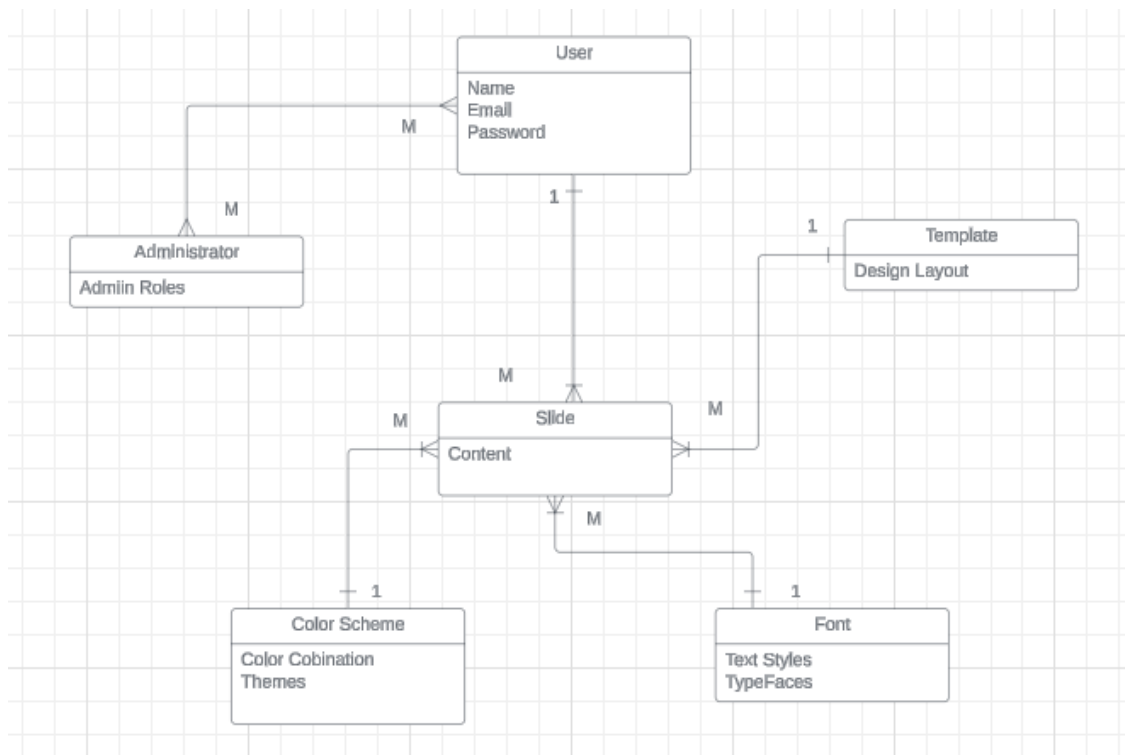


Figure 6 Domain Model

4.3. Entity Relationship Diagram with data dictionary

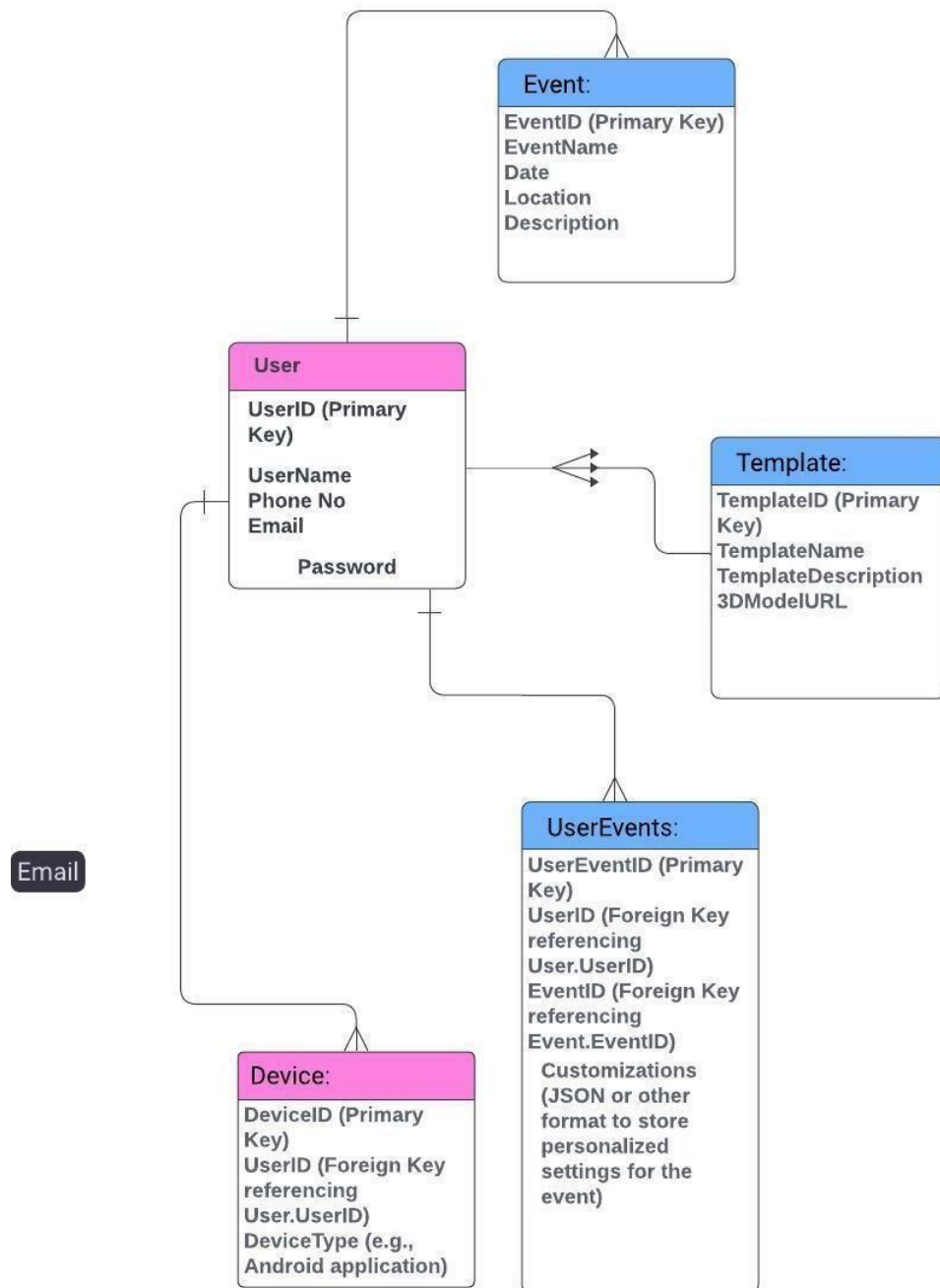


Figure 7 Entity Relationship Diagram with data dictionary

4.4. Class Diagram

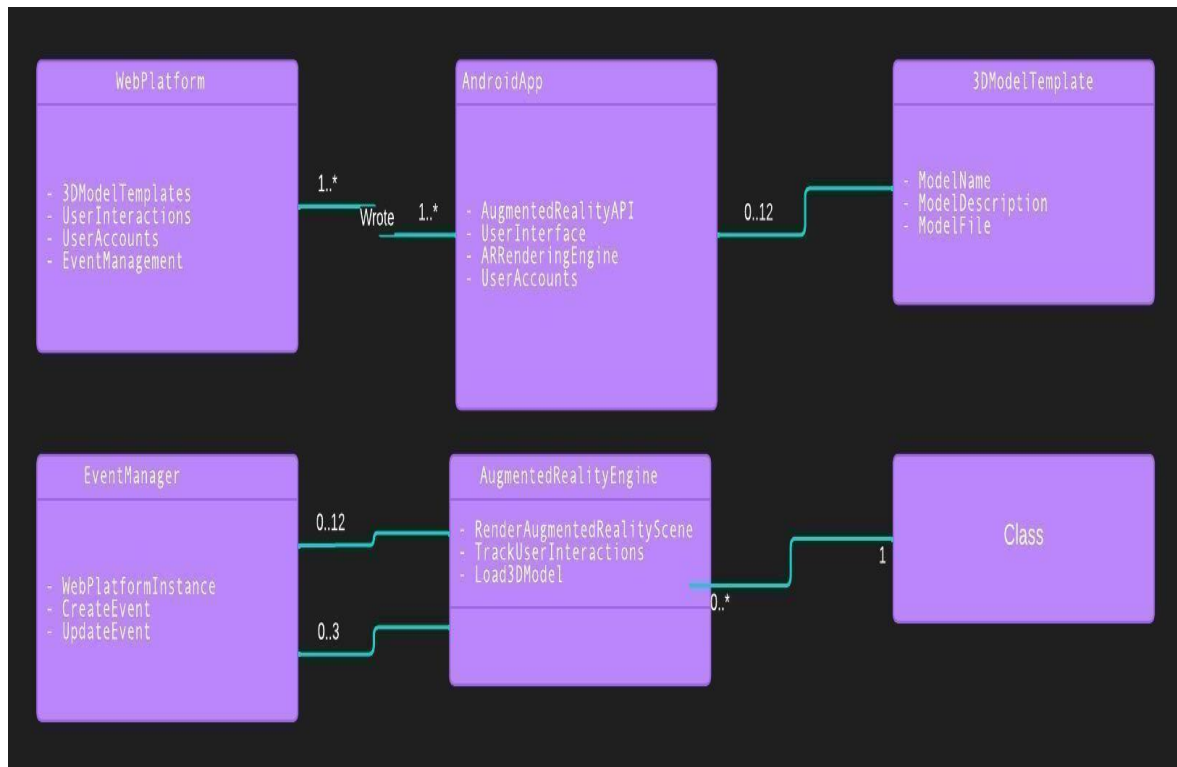


Figure 8 Class Diagram

4.5. Sequence / Collaboration Diagram

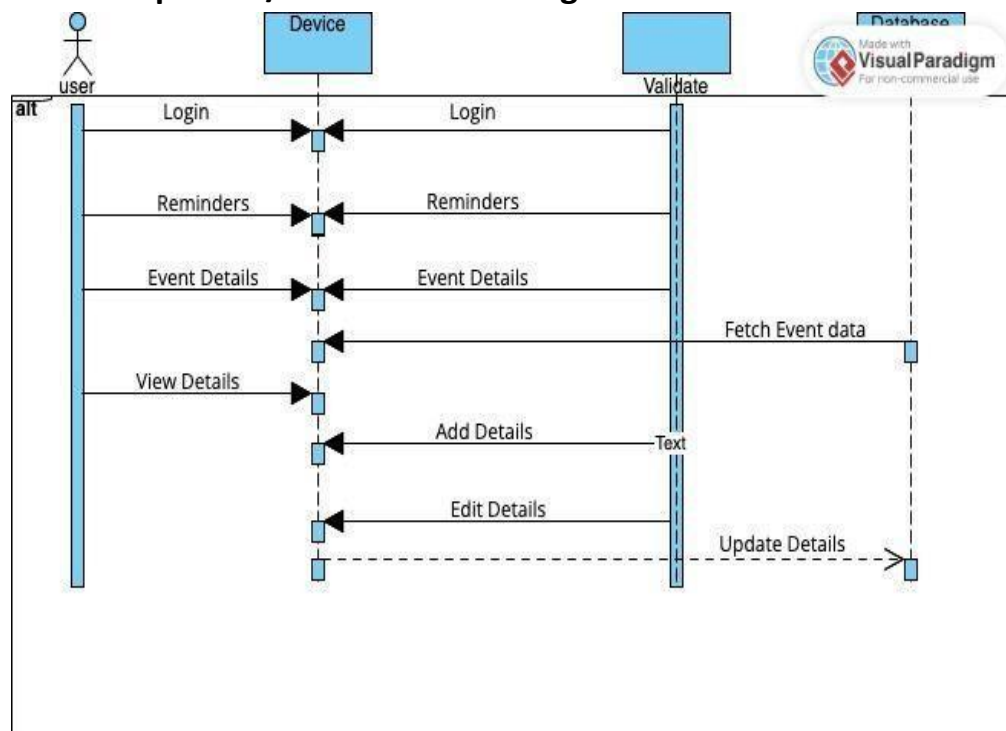


Figure 9 Sequence / Collaboration Diagram

4.6. Activity Diagram

Activity Diagram

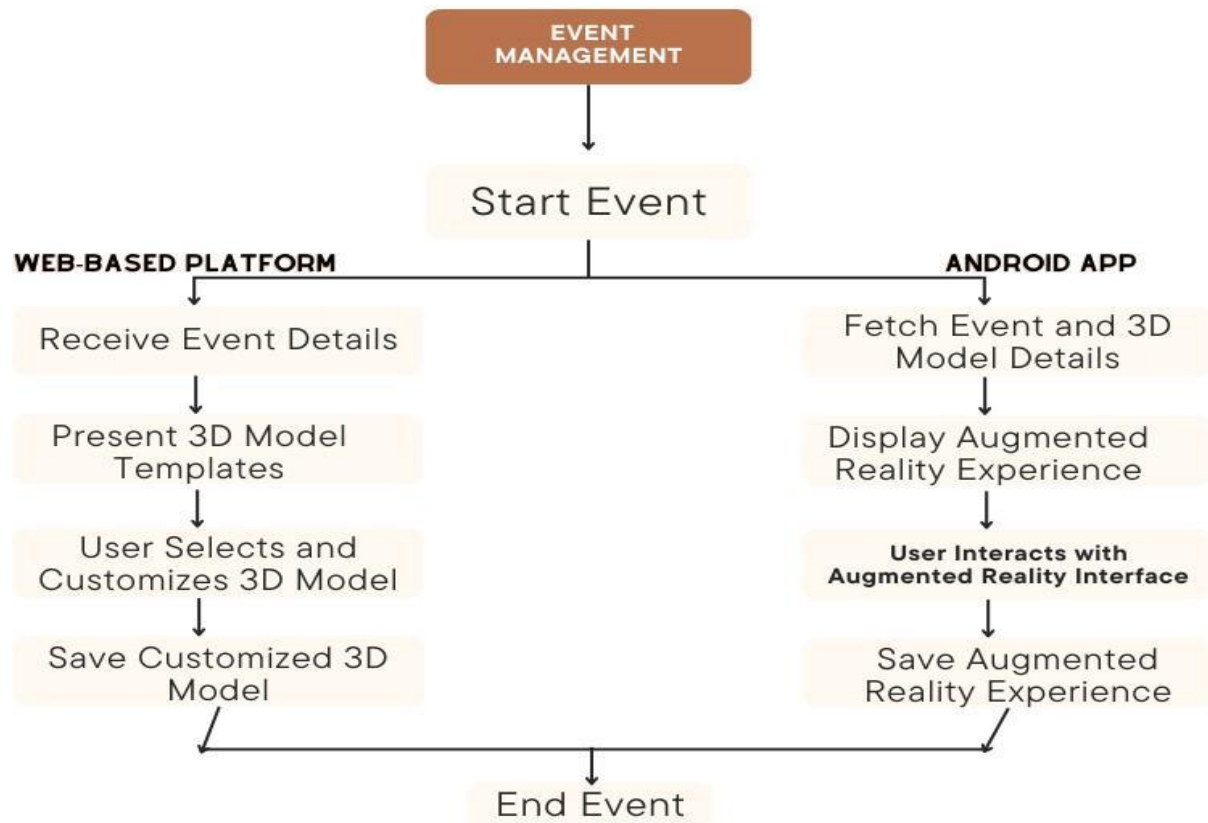


Figure 10 Activity Diagram

4.7. State Transition Diagram

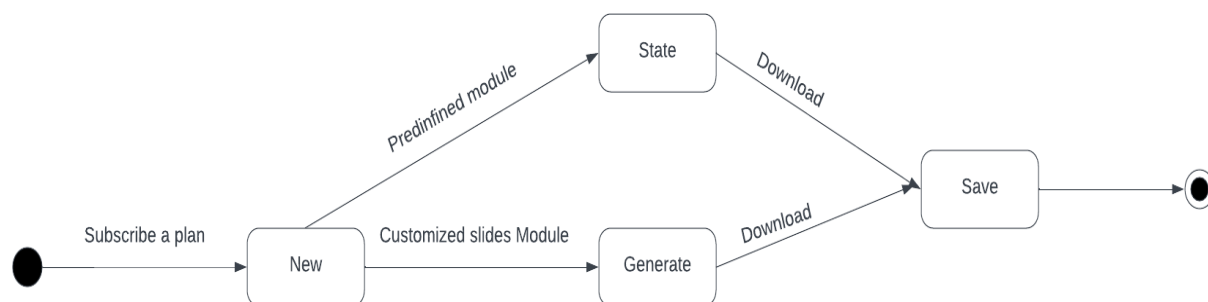


Figure 11 State Transition Diagram

4.8. Component Diagram

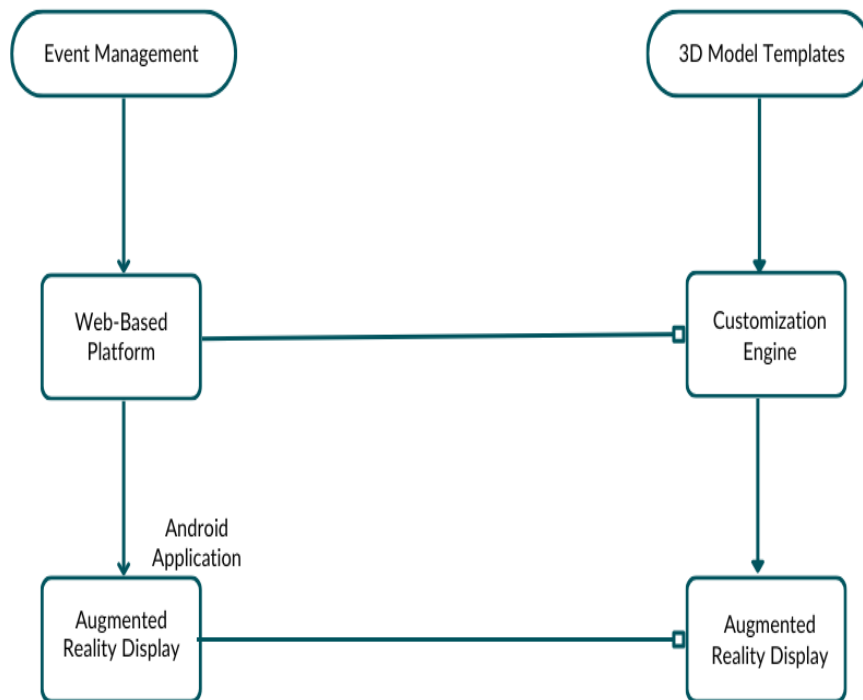


Figure 12 Component Diagram

4.9. Deployment Diagram

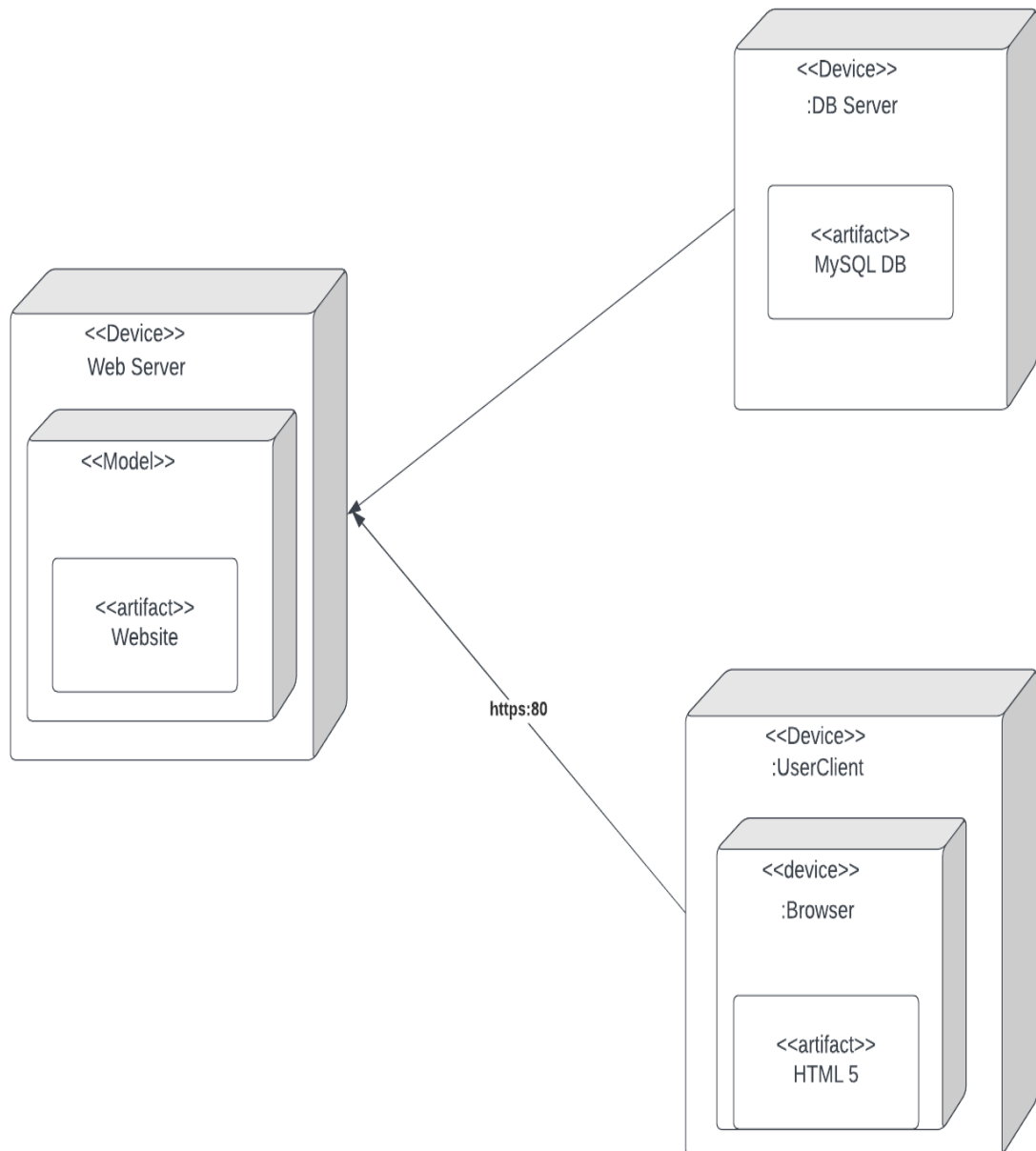


Figure 13 Deployment Diagram

Chapter 5

Implementation

Chapter 5: Implementation

The Register User method within the `User` class is a critical component of the event management platform, responsible for facilitating the registration process for new users. The method begins by validating the provided email address and ensuring that the accompanying password adheres to security standards. It then checks whether the email is already registered in the system, enforcing the uniqueness of user accounts. If these preconditions are met, the method proceeds to create a new user account, incrementing the total number of registered users as an invariant to maintain a consistent count.

5.1. Important Flow Control/Pseudo codes

User Registration Flow:

Procedure RegisterUser(email, password):

```

    if IsValidEmail(email) and IsSecurePassword(password) then if
        CreateNewUser(email, password)      IncrementTotalRegisteredUsers()
        SendConfirmationEmail(email)

        DisplaySuccessMessage("User registration successful. Confirmation email
sent.") else
        DisplayErrorMessage("Email address is already registered. Please choose a
different
one.")
    end if else
        DisplayErrorMessage("Invalid email or password. Please provide valid
credentials.") end if
EndProcedure

```

Customize Event Layout Flow:

Procedure CustomizeEventLayout(userID, eventID, selectedTemplate,

```

modifiedLayout): if IsValidUser(userID) and IsValidEvent(eventID) then

    if TemplateExists(selectedTemplate) then ApplyModificationsToLayout(eventID,
        modifiedLayout) DisplaySuccessMessage("Event layout customization
        successful.")

    else

        DisplayErrorMessage("Selected template not available. Please choose a
        different one.") end if

    else

        DisplayErrorMessage("Invalid user or event. Please provide valid credentials.")

    end if

End Procedure

```

Submit Event Feedback Flow:

```

Procedure SubmitEventFeedback(userID, eventID, rating, comment): if

    IsValidUser(userID) and IsValidEvent(eventID) then

        if IsRatingValid(rating) then

            RecordFeedback(userID, eventID, rating, comment)

            DisplaySuccessMessage("Feedback submitted successfully.")

        else

            DisplayErrorMessage("Invalid rating. Please provide a valid numeric rating.")

        end if

    else

        DisplayErrorMessage("Invalid user or event. Please provide valid credentials.")

    end if

End Procedure

```

1.1. Components, Libraries, Web Services and stubs

User Authentication

```
// Simulated user database const users = [

  { username: 'user1', password: 'password1', authToken: null },

  // Add more users as needed

];

function authenticateUser(username, password) {

  const user = users.find(u => u.username === username && u.password ===

  password); if (user) {

    user.authToken = generateAuthToken(username);

    return { success: true, authToken: user.authToken };

  } else {

    return { success: false, message: 'Invalid credentials' };

  }

}

function generateAuthToken(username) {

  // Simple token generation logic (for demonstration purposes)

  return `${username}_token_${Math.random().toString(36).substr(2, 10)}`;

}
```

Event Creation Workflow

5.2. Deployment Environment

The deployment environment for the augmented reality event management platform involves configuring the system for deployment in a production setting. Below are key considerations and steps involved in setting up the deployment environment

Infrastructure Setup

Cloud Service Provider: Choose a reliable cloud service provider (e.g., AWS, Azure, GCP) based on your requirements for scalability, reliability, and geographic distribution.

Server Configuration: Set up virtual machines or containers to host the backend server and databases. Ensure adequate resources for anticipated user loads.

Database Configuration

1. **Database Deployment:** Deploy the database system (e.g., MongoDB, PostgreSQL) to store user data, event details, and other relevant information.
2. **Data Security:** Implement security measures such as encryption and access controls to safeguard sensitive user and event data.

Backend Deployment

1. **Server Setup:** Deploy the backend server (Node.js, Express, etc.) responsible for handling user authentication, event creation, and other server side functionalities.
2. **API Security:** Implement secure communication protocols (HTTPS) and API authentication mechanisms to protect against unauthorized access.

Frontend Deployment

1. **Static File Hosting:** Deploy the frontend application (HTML, CSS, JavaScript) on a static file hosting service or a content delivery network (CDN) for optimized content delivery.
2. **Domain Configuration:** Configure a custom domain for the platform, and ensure proper SSL/TLS certificates for secure communication.

Augmented Reality (AR) Integration

1. **AR Service Configuration:** If leveraging third party AR services, integrate and configure the necessary APIs for AR features within the platform.
2. **Device Compatibility:** Ensure compatibility with a range of devices supporting AR features, and provide clear instructions for users on compatible devices.

5.3.6 Continuous Integration/Continuous Deployment (CI/CD)

1. **Automated Deployment Pipeline:** Implement CI/CD pipelines to automate the deployment process, allowing for seamless updates and enhancements.
2. **Testing Environments:** Set up staging and testing environments to validate changes before deploying to the production environment.

Monitoring and Scaling

1. **Monitoring Tools:** Integrate monitoring tools (e.g., Prometheus, Grafana) to track system performance, detect issues, and ensure optimal resource utilization.
2. **Scalability Planning:** Plan for scalability by implementing auto scaling mechanisms to handle varying loads during events.

5.3. Tools and Techniques

Development Tools

1. **Integrated Development Environment (IDE):** Utilize a powerful IDE such as Visual Studio Code or JetBrains WebStorm for efficient coding, debugging, and version control integration.
2. **Version Control:** Leverage Git for version control, ensuring collaboration among developers, code tracking, and easy rollback mechanisms.

Backend Technologies

Node.js: Choose Node.js for server side development, providing a scalable and efficient environment for executing JavaScript code.

2. **Express.js:** Implement Express.js as a minimal and flexible Node.js framework for building robust and scalable backend APIs.

3. **MongoDB:** Employ MongoDB as a NoSQL database to store and retrieve user data, event details, and other relevant information.

Frontend Technologies

1. **React.js:** Utilize React.js for building the interactive and dynamic user interface, enabling a component based structure for efficient development.

2. **Redux:** Implement Redux for state management in the frontend, facilitating predictable state changes and improved application scalability.

Augmented Reality (AR) Integration

1. **AR.js:** Leverage AR.js for web based augmented reality experiences, allowing users

to access AR features directly through their web browsers.

2. **ARCore and ARKit:** Integrate ARCore for Android and ARKit for iOS to ensure compatibility with major mobile platforms and provide a consistent AR experience.

5.4. Best Practices / Coding Standards

Maintaining code consistency and readability is a priority for the AI-Powered Slide Generation Website. To achieve this, the development team follows key best practices:

Coding Style:

- Adherence to industry-standard coding styles, like Google Style Guide or Airbnb JavaScript Style Guide, ensures a uniform codebase.

Modular Design:

- Code is organized into modular structures, promoting reusability and simplified maintenance.

Descriptive Naming:

Comments:

- Meaningful comments are added for complex logic, contributing to code comprehension.

Error Handling:

- Robust error-handling mechanisms are implemented to manage exceptions and maintain a smooth user experience.

Testing:

- Unit and integration testing practices are integral to validate code functionality and integration.

Security:

- Stringent security practices, including input validation and encryption, safeguard user data.

Code Reviews:

- Regular team code reviews foster knowledge sharing, identify issues, and

maintain code quality.

Continuous Integration:

- Automated CI pipelines ensure early issue detection and a consistent build process.

5.5. Version Control

Version control is crucial for the AI-Powered Slide Generation Website's development, with Git as the primary system following industry best practices:

Branching Strategy:

- A structured approach enables separate development of features and bug fixes before merging into the main branch.

Commit Guidelines:

- Clear and concise commit messages enhance traceability and collaboration.

Pull Request Workflow:

- Collaborative code review through pull requests ensures code quality before integration.

Continuous Integration:

Chapter6

Testing and Evaluation

Chapter 6: Testing and Evaluation

6.1. Use Case Testing

The staged testing is one of the processes that go through when the management examines the scenarios where we would have been needed in planning of the event and utilization of our platform and Android application, respectively. This approach of testing lets us evaluate how the product is actually working in field conditions as well as verify that it conforms to the expectations and specifications of the target audience. Through the simulation of utilization cases like, building event layouts, developing 3D scenes, and showing augmented reality applications, we can detect and fix the problems or suggest the better ways to create them. In the next chapter, we will do case testing of our solution on the base of its own development. Our readers will find out how functioning result it will bring and how easy to use it will be.

6.2. Equivalence partitioning

User Inputs: Take the case of the partitions, where user input is categorized among the equivalence classes, hold on this will become our partitioning. Take registration of the event as an example; the user can answer the number of participants, and this input can be categorized to the type such as valid inputs (i.e., number within a specified range), invalid inputs (e.g., values that are not supposed to numbers or negative figures), and boundary inputs (i.e., minimum and maximum acceptable values).

Device Compatibility: An android app can adopt a system of equilibrium partitioning, where data is used for the testing of different android devices or operating system versions realtime for the purpose of checking whether they can all run the app seamlessly. The input aim should be separated into famous devices with filter(for example coffee machine with filter) or type of system(android 9, android 10) in order to support the app in different devices and configurations.

6.3. Boundary value analysis

User Inputs: Users save time by putting their values in fields like number of attendees or budget of the event instead of long text. Therefore, we can detect valid input boundaries. Another important addition to boundary value analysis is if the minimum number of people

who can attend an event is 10 and the maximum number is 100, the boundary value analysis will include checking values like 9 (very close to the minimum), 10 (equal to the minimum), 11 (just higher than the minimum), 99 (very close to the maximum), 100 (equal to the maximum).

System Limits: Moreover the method of boundary value analysis is applicable for case when any certain values are inserted into the function (inputs and event parameters) or constraints are identified. Taking, say, examinations of the system functionality at the moment when it is going to access the memory limit, file size limit, or maximum number of concurrent users is one of the methodologies.

6.4. Data flow testing

Data Entry and Validation: The system we have in mind will let users in with the names of events, number of attendees and the customization options. Data flow testing will test the accurate input into the application and the right flow of data besides the data validation and security which could be a source for errors and security vulnerabilities

Data Transformation: The platform is built on the process of data conversion, which could be of CAD specifications out of user inputs or it could be of location coordination to the AR (augmented reality) experiments. This test of data flow will enable us to check that the intended operations have been properly implemented and the data is accurate, as required by the specifications, to guarantee validity of augmented reality representations.

Data Dependency Analysis: Consequently, our project is built upon a complex architecture which include event patterns, customer options and AR methods. Data flow testing allows us to identify data dependencies among the system's components that could lead to problems like data inconsistency, wrong data propagation or data loss. Hence proper data flow governance is implemented during data storage and transfer by the system.

6.5. Unit testing

Component Testing: The idea of unit testing is that we should check how certain parts or modules of our program work when they are being used alone, so we can run such functions, methods, or classes that are responsible for the specific functions. To illustrate, we could check on 3D rendering model handling or user interaction module testing. Thanks to the unit

test, the components of the system are making sure that everything is working as it should and is producing the desired result.

Automation: Unit testing can be automated in machine-readable and easy-to-execute to speed up and make continuous testing accessible. Running automated tests assure direct feed on the code modifications, with alert notifications on a problem architecting. To accomplish this, integrate into the CI/CD pipeline, where there will be testing before deployment.

Test Coverage: Unitary testing is meant to have valid 100 percent code coverage to ensure all code paths and all functionalities are tested. Measures such as statement, branch and path coverage facilitate thorough testing and locating possible problem areas, which indirectly results in high-quality and reliable software.

6.6. Integration testing

Module Integration Testing: This kind of testing identifies whether the components or modules are tightly connected with each other. Listen to the given audio and predict the pronunciation of the underlined words.: For instance, we have the backbone in which the event customization module is properly handling with the 3D model rendering.

System Integration Testing: System integration testing concerns on ensuring the compatibility of the various features, which could be the subsystems or layers of our platform and Android application in a real-world scenario. It guarantees that the elements of the subsystems such as hardware and software should work together seamlessly aiming for the functionalities you need.

API Integration Testing: The scope of API integration test is basically to ensure that the integration points between our software and other external APIs/services are expected norms. This not only guarantees the free circulation of information but also levies the exchange of data across our system and outsourced services with zero errors.

UI Integration Testing: UI integration testing provides an assurance of proper user interface (UI) component integration, which is essential to verify that the user interface entities are unmixed and functions without any glitches across different devices and screens.

6.7. Performance testing

Load Testing: Scenario testing measures our application's performance under expected or currently applied user loads. It simulates a number of users utilizing/accessing the platform

at once, to evaluate if the system can handle such concurrency and if it answers/handles the corresponding requests within an acceptable time.

Stress Testing: Stress testing is performed at the limit for the system that goes beyond its normal working conditions in order to find the tipping point for failure. It gauges how verified our platform and app function on the type messed up status by subjecting it under extreme conditions like in Googly or resource contracticness.

Scalability Testing: Scale testing deals with the issues that your system faces while scaling to meet the increasing user requirements. It assists us in comprehension on what measures to undertake as the user count or data volume surges and we need to handle growth without the significant deterioration in performance.

Chapter 7

Summary, Conclusion and Future Enhancements

Chapter 7: Summary, Conclusion & Future Enhancements

7.1. Project Summary

Our new business has launched an augmented reality (AR) management solution aimed at transforming business processes in the management of quality events. This unique technology is changing the attendee experience and programming in a transformative way.

AR's management solutions provide a seamless platform that integrates AR technology with competitors and outperforms today's technology. Schedule of events. This effort has resulted from our recognition of the limitations of traditional planning approaches and the urgent need for detailed, thoughtful solutions.

AR solutions provide emergency management with efficient, cost-effective planning. Event organizers can monitor the site, try to make a difference, and see the weather immediately. This allows people to use information to make decisions, leading to improvements.

7.2. Critical Review

In critical review the project of ours has experienced a full check on strong and weak points and were revealed to be corrected. Augmented reality (AR) is added nicely to the event management and it exceeds the existing technology development. However, it needs to be sharpened in some places. The most prominent positive point is the feature of interface customization, which users can easily use and enjoy the interface. Nevertheless, the administration's goal of gaining excellent system performance becomes arduous because of the fact that there are obstacles in aligning the system configuration and scalability to meet the fluctuating number of users and data volumes. We will have to pay special attention to the outlined issues in order to maintain the implementation effectiveness and longevity in the quest of revolutionizing event planning by AR technology.

7.3. Lessons Learnt

While considering the entire greenhouse project, several important lessons were learnt; these will be taken to the books for the upcoming ventures. One of the main things is clear here that of the importance of meticulous planning and requirement definition at the early

stage of the project. The main pillar for the successful implementation of the project is clearcut and wellstructured objectives that underlie the process. Besides that, the communication and coordination inside the team remain foundational tactics for accomplishing tasks and solving issues wisely. Furthermore, both iterative development and constant feedback patterns give chance for adjusting the requirements and the end user's desires which are subject to change. Being ready to see the bigger picture and acknowledge the constant positivenegative context helps determine whether the achieved success will be sustainable or the setbacks will be just a lesson. Lastly, such experiences emphasize on agility, adaptability, relentlessness in pursuit of excellence as being the basis for achieving the home run in project success.

Appendices

Appendix A: User Manual

The appendix, thus, is a one stop guide, explaining step by step to the users the way they should navigate and also utilize the platform and the Android application. It thereby simplifies the process and gives instructions, tips, and feedback on things the client can do to obtain optimal use experience of our event planning software. From event layouts created by users themselves to products to manage attendees, whether users are visualizing augmented reality experiences or conquer our technology – our technology – this manual will give them the knowledge and resources they need to do that smoothly. It goes from the basic functionalities to the most advance features. So when the users don't know what to do next, they should see this appendix as the perfect resource, which help them the most to enrich their experience using our platform and Android application.

A.1. Introduction

In the rapidly updating the realm of event management, the taping on to upto date technologies has got pivotal. Our project provides the new impetus of the development of the events planning technology propelled by the Augmented Reality (AR) to enable the previously nonexistence process of planning, visualization, and realization of events. With this, we shall dive into the intertwined course of virtual influence and brickandmortar conference planning, showcasing the disruptive effect that the platform and and app has. We begin stepbystep this tour and want to guide you through the exciting universe of ARenhanced event management, into which both the vivid imagination and cuttingedge technologies are brought to life.

A.1.1. Project Overview

The project report delivers a summary of our plan, including an outline of the objectives, situations, and importance of our project. The heart of our project is to simply come into the traditional event planning method and to use all opportunities that the Augmented Reality (AR) technology can give. The creation of the platform and apps of Android will be the means

to unlock an in the past unpredictable way for the events to be visualized and personalized. We will design to be there layouts in 3D which is immersive. Also, AR applications will be deployed to improve the attendee engagement. We are changing event management with our project. As a talented speaker that covers the prospects and power of the new approach, the stakeholders receive an understanding of how the newly created tool could be a game changer ensuring new heights in event planning.

A.1.1.1. Technology Stack

Our tech stack is made of a fine tune blend of tools and frameworks critical to the platform and application development and functioning. It includes:

1. Frontend Development:

JavaScript

JS – a JavaScript library for applications on the web platform

As an Android developer, I have found that I prefer Kotlin as my programming language for application development.

2. Backend Development:

Node.js

A Restful API with Express as a tool for creation.

MongoDB for the purpose of managing databases

3. Augmented Reality (AR) Integration:

Unity 3D for assemblage is kept in plain sight.

ARCore for google allows users to have better visualization of augmented reality on their phones.

The support for ARKit on iOS and AR integration (as much as possible) will be reviewed as well

4. Version Control

It is a tool to manage version control issues.

Any of git or GitLab to be using for partnership and hosting of code repository.

5. Deployment and Hosting:

Docker for containerization

Kubernetes an ideal container orchestration technology (available but optional)

AWS or Google Cloud can be used as hosting providers on the cloud.

6. Testing and Quality Assurance:

Jest and Enzyme for JavaScript testing on the client side.

Mocha and Chai for Unit testing the code in the backend

Selenium framework for comprehensive user interface automated testing

During performance testing use Apache JMeter or Locust.io like loadtesting tools

7. Continuous Integration/Continuous Deployment (CI/CD):7. Continuous Integration/Continuous Deployment (CI/CD):

Jenkins, CircleCI or GitLab CI/CD for continuous automated delivery of build, test and deployment pipelines.

This technology stack is also instrumental in extensibility, robustness, and feature richness of the platform as well as the application built for Android, which therefore, eases the integration of AR into event management.

Appendix C: Information / Promotional Material

C.1. Broacher

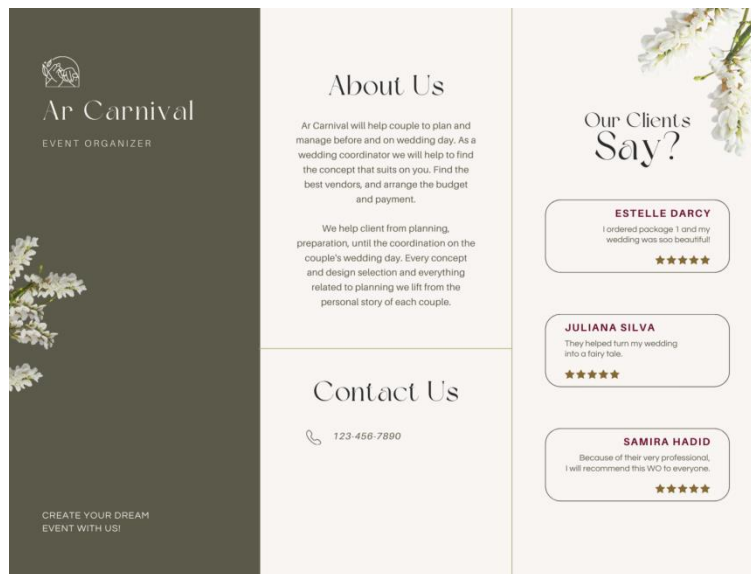


Figure 14 Broacher

C.2. Flyer

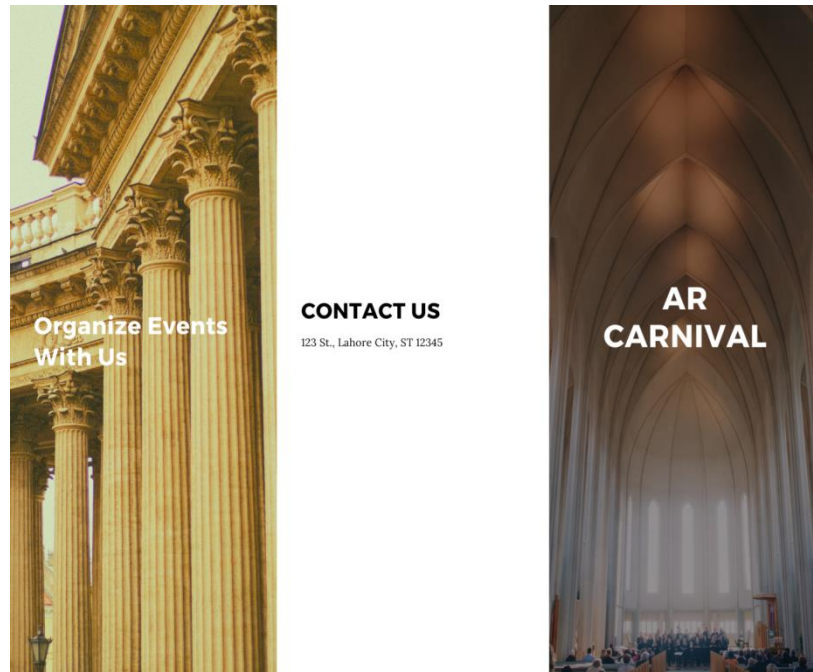


Figure 15 Flyer

Standee



Figure 16 Standee

C.3. Banner

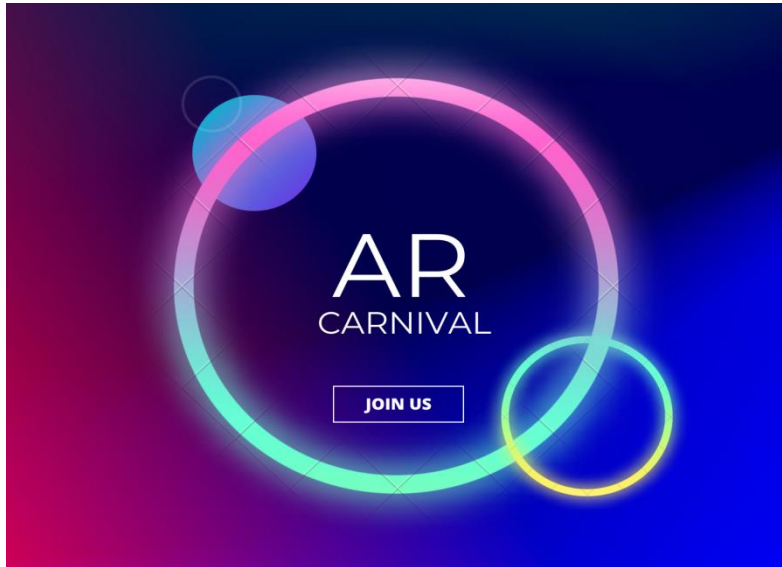


Figure 17 Banner

Reference and Bibliography

References

Documentation:

React-Native Documentation <https://reactnative.dev/docs/getting-started>

Firebase Documentation <https://firebase.google.com/docs>

Stack Overflow:

Valuable for troubleshooting and finding solutions to coding challenges.

<https://stackoverflow.com/>

Development Courses or Tutorials:

Online courses or tutorials that we took for learning specific programming languages, frameworks, or tools.

<https://www.udemy.com/course/flutter-augmented-reality-course-build-10-android-ar-apps/>

YouTube Channels or Video Tutorials:

Video resources that provided insights or tutorials related to app development.

<https://www.youtube.com/watch?v=bZobARdf8jk&t=378s> (AR Integration)