EVENT MANAGEMENT SYSTEM FOR CAREER FAIR

BY

LEE WEN XUAN

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___Encik Ammar Bin Azlan__
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I would like to express my sincere thanks and appreciation to my supervisor, Encik Ammar Bin Azlan who has given me this bright opportunity to engage in an Event Management System project. It is my first step to establish a career in system coding design. A million thanks to you.

ABSTRACT

In the current event management system market, there are many versatile tools that cater to a wide range of events such as corporate meetings and entertainment activities. These systems offer comprehensive features including attendee registration, event scheduling, ticketing, and basic engagement options, making them suitable for a variety of event types. However, there's a noticeable gap in their functionality when it comes to specialized events, particularly those in the career sector. Therefore, this project aims to address this gap by introducing features that are specifically designed for the unique requirements of career event. This includes a sophisticated module dedicated to managing the complex schedules of career fairs, which typically involve various sessions, workshops, and exhibit booths. This module is tailored to meet the dynamic nature of these events. In addition, the system will provide a space for alumni from various professional backgrounds to connect with attendees, fostering networking opportunities and facilitating mentorship relationships. This feature aims to bridge the gap between aspiring professionals and seasoned industry experts, enhancing the career development experience at the fair. Another notable feature is the use of QR code technology for various purposes, such as providing quick access to information at booths and streamlining the event check-in process, thereby enhancing the overall experience for both organizers and attendees. The development of this system begins with an exhaustive background analysis to identify the deficiencies in current event management applications, particularly their inadequacy in meeting the needs of career fairs. Subsequently, a comprehensive literature review is conducted to examine existing systems and grasp the specific requirements of career-related events. The project's scope and objectives are then clearly outlined, with a focus on crafting a system that seamlessly integrates detailed program management, alumni networking features, and advanced QR code functionalities tailored for career fairs. This strategic approach aims to address the unique challenges associated with managing career fairs while enhancing efficiency, engagement, and the overall event management process in this domain.

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LIST OF SYMBOLS

™	Trademark

LIST OF ABBREVIATIONS

EMS	Event Management System
EMA	Event Management Application
KPI	Key Performance Indicator
ROI	Return On Income
QR	Quick Response
API	Application Programming Interface
MVP	Minimum Viable Products
NLP	Natural Language Processing
REST	Representational State Transfer
SSO	Single Sign-on
JSON	JavaScript Object Notation
AI	Artificial Intelligence

Chapter 1 Introduction

In this chapter, we present the background and motivation of our research, our contributions to the field, and the outline of the thesis.

An Event Management Application (EMA) is a digital tool that streamlines the planning, organization, and execution of events, encompassing a range of features such as event registration, ticketing, venue selection, scheduling, attendee engagement, and post-event analysis [1]. Event management involves planning and running an event whether virtually or physically from start to finish [1]. It includes deciding when and where the event will take place, choosing a theme, and making sure everything goes smoothly for an event [1]. After an event, event managers are tasked with reviewing event data, submitting Key Performance Indicator (KPI) and Return on Income (ROI) findings, and staying on the ball for any post-event offerings [2]. Current Event Management System (EMS) offer a range of features to assist organizers with the planning, execution, and management of events. Some of the key features that a good EMS must have include:

A seamless event registration and ticketing system is essential for managing attendee sign-ups and ticket sales using form.[3] The attendee can register online using form to sign-ups for respective event and organizer will perform validation from the

EMS should provide tools for managing attendee information, such as contact details, preferences, and engagement history [3]. In a career fair context, the EMS should provide robust tools for managing comprehensive attendee profiles, including contact details, career interests, session preferences, and historical engagement data.

The ability to search, select, and manage event venues is crucial for the logistical planning of events [4]. This tool could provide detailed information about venues, including layout plans, capacity, and technical capabilities, aiding in making informed decisions.

However, there is a lack of specific EMS tailored to the unique needs of career fairs, which often require a more customized approach to accommodate the specific requirements of such events.

In the context of career fairs, current EMS may not provide the necessary features to effectively manage the event lifecycle, from planning and execution to post-event evaluation. This gap highlights the need for a more specialized Event Management Application that caters to the unique challenges and opportunities associated with career fairs. By solving this gap,

event organizers can benefit from a more efficient and streamlined event management process, ultimately leading to the successful execution of career fairs.

1.1 Problem Statement and Motivation

Based on the introduction, current EMS are generally not optimized for the specific requirements of career fairs. They often lack the specialized functionalities necessary to address the unique challenges and dynamics of managing such events. This inadequacy results in inefficient event organization, lower engagement levels, and a suboptimal experience for both organizers and attendees.

1. Inefficient Event and Company Selection Process at Career Fairs

Current career fair management systems lack efficient mechanisms to match attendees with relevant events and companies. Attendees often struggle to navigate through numerous options, leading to missed opportunities and inefficient use of time. The absence of intelligent matching systems results in suboptimal interactions between job seekers and potential employers.

2. Limited Digital Networking and Information Exchange Capabilities

The second big problem is that current event management systems offer limited opportunities for networking and community engagement, especially at career fairs where these interactions are very important. One key issue is the lack of platforms or tools that help employers get involved. Employers are essential at career fairs because they provide valuable advice, share experiences, and offer networking opportunities for job seekers. However, most systems don’t have enough features to enable direct and effective communication between employers and job seekers. For example, job seekers often need to carry important documents like resumes and certificates to apply for jobs. While carrying these documents isn’t too difficult, it can be inconvenient to keep presenting them repeatedly, especially when managing other things like bags and promotional materials. The busy environment at career fairs also increases the risk of losing or forgetting these important documents.

3. Inefficient Use and Integration of Quick Response (QR) Code Technology

The underutilization of QR code technology in event management systems is another notable issue, particularly relevant in the dynamic environment of career fairs. For existing system, it

is only use for recording the attendance of the attendees, therefore the potential of QR codes to provide instant access to information and facilitate various interactions remains largely untapped in current systems. This underuse of QR code technology results in missed opportunities for enhancing information dissemination and attendee engagement at career fairs. Furthermore, the potential of QR codes in streamlining networking opportunities at such events is often overlooked. QR codes can significantly simplify the process of information exchange and connection building among attendees, yet their application in this context is not adequately explored in existing event management systems.

1.2 Research Objectives

The objective of this project is to implement targeted solutions aimed at addressing specific challenges encountered in the management of specialized career fairs. The expected outcomes of these solutions are to enhance the overall experience and effectiveness of career fair management.

1. **To design a function to analyze job postings and resume from the career fair and match them with user preferences using natural language processing (NLP).**
2. **To investigate the current networking challenges faced by attendees and employers focusing on information exchange limitations.**
3. **To determine the current utilization and integration of QR code technology within career fair environments, examining its effectiveness in enhancing attendee engagement.**

In summary, the project seeks to enhance the management of specialized career fairs by implementing targeted solutions that address identified challenges. Through improvements and innovate creation of chatbot, networking opportunities, and QR code technology utilization, the project aims to create a more efficient and engaging event environment.

1.3 Project Scope and Direction

This project aims to create a comprehensive mobile app for managing career fairs. The app includes several key features designed to improve the experience for all users, including students, employers, and event administrators.

The app starts with a user authentication and registration system. This allows different types of users - students, employers, and administrators - to log in and access features specific to their roles. This ensures that everyone has the right tools and information for their needs. For organizing career fairs, the app has an event creation and management system. Administrators can create new events, employers can apply to participate, and students can join these events. This streamlines the entire process of setting up and running a career fair.

A major feature of the app is its use of QR code technology. Users can generate and scan QR codes to quickly exchange information at the fair. To keep this information safe, the app encrypts the details using Base64 encoding. This makes sharing information both fast and secure. The app also includes a digital card identity feature. When users scan each other's QR codes, they can save the information as a digital business card. This makes networking easier and reduces the need for paper cards.

To help job seekers, the app has an AI-powered resume tool. Users can upload their existing resume for improvement, or they can build a new one from scratch using generative AI. The app can also use AI to match resumes with job listings, helping users find the most relevant opportunities at the fair. For employers, the app offers cloud documentation features. They can upload brochures and other information, which attendees can access by scanning a QR code. This also allows for easy online resume submission.

The app includes a questionnaire system that collects information from attendees when they join an event. This helps organizers gather valuable data about participants. Finally, the app can export data to CSV files. This includes submitted resumes, student details, and questionnaire responses. Employers and event organizers can use this feature to easily analyze data from the event.

Overall, this app aims to enhance career fairs by making them more efficient, interactive, and data driven. It addresses many common challenges in career fair management and provides innovative solutions using technology like AI and QR codes. The goal is to create a better experience for students seeking jobs, employers looking for talent, and administrators organizing these important events.

1.4 Contributions

The development of this specialized EMA for career fairs contributes significantly in various dimensions. Primarily, it introduces innovative use of technology in the event sector. By integrating modern functionalities like QR code interactions for information access and for digital identity exchanges, the application stands as a beacon of technological advancement tailored specifically for career fair settings.

This EMA is also a testament to the importance of customized solutions in event management. It addresses the unique challenges that come with organizing and attending career fairs. Features such as detailed program tracking, efficient attendee management, and collaborative tools are designed specifically to streamline the complex logistics and enhance the organizational efficiency of career fairs. This focus on customization ensures that every aspect of the fair, from planning to execution, is optimized for the best possible outcomes.

Moreover, the application significantly improves the user experience for all stakeholders, including attendees, institutions, and event organizers. Its user-centric design simplifies navigation and interaction, making career fairs more accessible and engaging. This enhanced user experience is pivotal in encouraging greater participation and engagement at these fairs, thereby enriching the career seeking journey of students and employers alike.

In addition to these direct benefits, the application also offers valuable data-driven insights. By analysing user interactions and preferences, the system can provide organizers with actionable insights to continually refine and improve the event experience. This data-centric approach aids in making informed decisions, ultimately leading to more successful and impactful career fairs.

Lastly, the application contributes to environmental sustainability. By reducing the need for physical materials like brochures and flyers, and facilitating digital exchanges of information, it aligns with eco-friendly practices. This not only reduces the carbon footprint of the events but also modernizes the approach to information dissemination in line with global sustainability goals.

In conclusion, the EMA development is a holistic contribution to the field of event management in careers, marking a significant step forward in terms of technological innovation, customization, user experience, data utilization, and environmental sustainability.

1.5 Background Information

In recent years, the field of event management has experienced significant changes due to advancements in digital technologies. Traditionally, events like conferences, trade shows, and career fairs relied on manual processes for planning and organization, which often led to inefficiencies and logistical issues. However, the introduction of EMA has transformed how these events are managed, offering more efficient solutions for both organizers and attendees.

Among the various types of events, career fairs stand out as important platforms for connecting job seekers with potential employers and companies. These events play a crucial role in shaping individuals' career paths and providing networking opportunities. Historically, career fairs have relied on traditional methods such as paper-based registration and manual scheduling.

Moreover, with the rise of digital platforms and mobile technology, there is a growing demand for innovative solutions to enhance the management of career fairs. This shift towards digitalization has led to the development of specialized EMAs specifically designed for career fairs.

Furthermore, understanding key terms like EMS, NLP, and QR code technology is essential for grasping the context of this project. An EMS is a digital tool that helps streamline event planning, organization, and execution by offering features such as event registration and attendee engagement. NLP is a branch of artificial intelligence focused on enabling computers

to understand and interpret human language, while QR code technology allows for quick access to digital content via smartphone scanning.

For readers who may not be familiar with event management or technological concepts like NLP and QR codes, this background information provides necessary context to understand the significance of the project. By outlining the historical development of event management practices and the role of technology in shaping modern approaches, readers can better appreciate the purpose and potential impact of the project.

Chapter 2 Literature Review

2.1 Review of the Existing Applications

There will be three event management system that I will analyze and list out their functionalities.

2.1.1 EventBrite

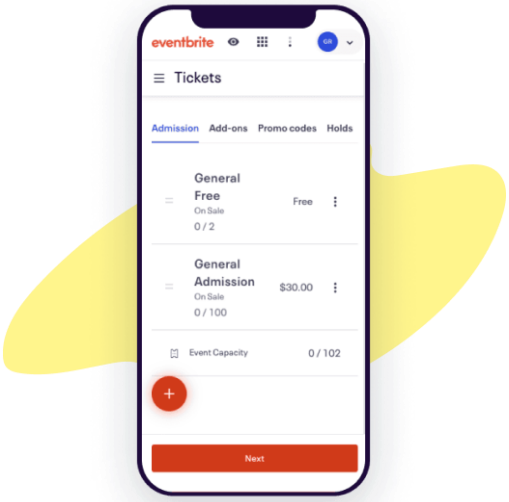


Figure 2.1 EventBrite Application Interface

Figure 2.1 shows the application interface of Eventbrite application, Eventbrite offers a robust search engine for event discovery, allowing users to find events based on various criteria. It provides a user-friendly template for creating custom event pages with details, ticket sales [8], sponsor promotion, location maps, and social media integration [8]. The platform supports hybrid and virtual events, integrating with tools like Zoom for online participation. Eventbrite also includes features for invitation and RSVP tracking, ticketing, and secure online payment processing [8].

EventBrite is a comprehensive event management platform that offers a range of features to streamline the entire event organizing process. One of its core functionalities is event creation, where organizers can easily set up and customize event pages. This feature allows for the inclusion of detailed event descriptions, images, and other essential information, providing a professional and engaging online presence for the event.[15]

Another critical aspect of EventBrite is its user registration process. This process is designed to be straightforward and user-friendly, enabling attendees to sign up for events with ease. The platform supports various types of events, from free to paid, and offers flexibility in how attendees can register, including options for early bird pricing, VIP tickets, and group registrations.[15]

Mobile check-in is another feature that enhances the attendee experience. This feature allows event organizers to manage entry to the event efficiently. Attendees can check in via a mobile app, speeding up the process and reducing the need for physical tickets. This mobile capability is particularly beneficial for large events, where managing entry can be a significant logistical challenge.[15]

Finally, EventBrite provides functionality for on-site tickets and registration. This feature caters to last-minute attendees who decide to join the event on the day. It allows organizers to continue managing ticket sales and registrations seamlessly, ensuring no potential attendee is turned away due to pre-event sales closures. This capability is crucial for maximizing attendance and revenue, especially for events with a high likelihood of walk-in participants.[15]

2.1.2 Cvent

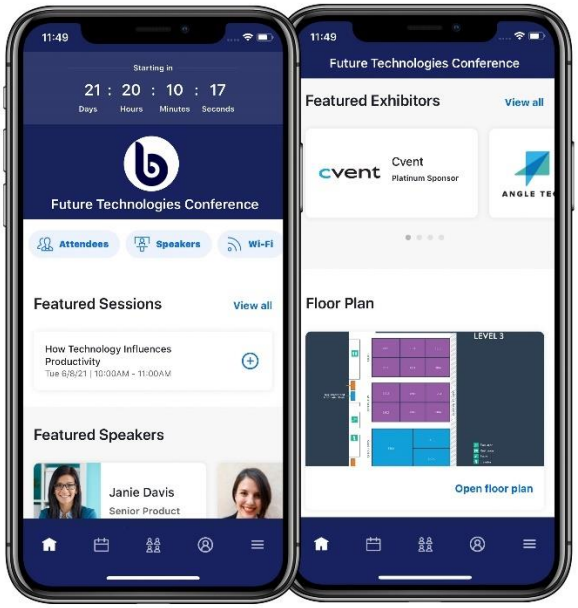


Figure 2.2 Cvent Application Interface

Figure 2.2 shows the application interface of the Cvent App. Cvent is known for its wide range of functionalities, including attendee management, hybrid event support, and customizable event website creation [9]. The platform allows for effective attendee engagement and tracking [9]. It offers tools for venue sourcing and provides insights for data-backed event planning.

Cvent's suite of features, known as Onsite Solution™, offers a comprehensive set of tools designed to enhance the event experience for both organizers and attendees [14]. The system kicks off with a streamlined Check-In and Badging process, ensuring a positive first impression by allowing attendees to check in swiftly, either through assisted or self-service options, effectively eliminating long lines and wait times [14]. This seamless entry process is crucial in setting the tone for the event.

Another significant feature is Lead Capture™, a tool that allows exhibitors and sponsors to easily scan and capture attendee information [14]. This functionality is invaluable for tracking attendee interest, enabling the efficient qualification and maximization of lead flow, thereby enhancing the impact for exhibitors and sponsors [14].

Cvent further enhances the event experience with its Mobile Event Apps [14]. These innovative applications offer a range of features including custom branding, activity feeds, push notifications, and attendee messaging, all designed to provide a smarter and more engaging experience for attendees [14]. The use of mobile apps ensures that participants have all the necessary event information at their fingertips, fostering a more connected and interactive environment [14].

2.1.3 Whova

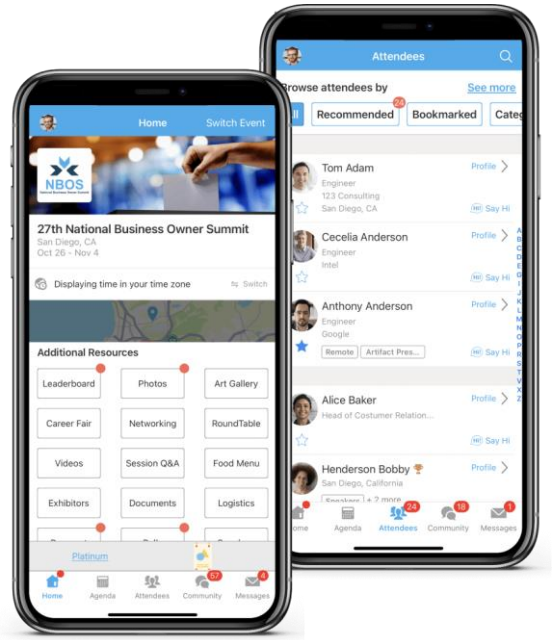


Figure 2.3 Whova Application Interface

Figure 2.2 shows the application interface of Whova. Whova stands as a distinguished award-winning event and conference app, designed to enhance your event experience by providing valuable insights into the individuals you connect with [10]. Widely embraced by professionals across diverse fields, Whova is a go-to mobile app for networking at conferences, trade shows, expos, summits, conventions, business meetings, corporate events, association gatherings, and community events [10]. Notably, Whova's excellence has been consistently recognized, having secured the prestigious Event Technology Awards for five consecutive years. This attests to its reliability and innovation in the realm of mobile event apps [10].

One of the key features of Whova's system is its convenient data import capability. It seamlessly integrates with various registration systems, including Eventbrite[8], streamlining the data import process. This functionality is particularly useful for organizers who have pre-existing event data in these platforms, enabling them to transfer essential information like event details and attendee lists efficiently. For those who haven't used these systems, manual import options are also available, ensuring flexibility.[16]

Whova also excels in detailed agenda creation and management. Organizers can easily construct one-track or multi-track event sessions, catering to diverse attendee interests and

enabling personalized agenda building [16]. This feature is invaluable in ensuring that each attendee can engage with content that is most relevant to them.

In terms of logistics, Whova offers a customizable platform where organizers can include comprehensive logistical information [16]. This could range from GPS guidance and parking instructions to additional learning resources and special events information. The flexibility in this section allows for a tailored approach to each event's unique logistical needs.

Furthermore, Whova's system allows for the customization of administrative access, enabling team collaboration in the event management process [16]. Organizers can set and define permissions for team members, streamlining the workflow and ensuring efficient management.

Overall, Whova's Event Management System, coupled with its mobile app, provides a comprehensive, integrated solution for event organization [16]. Its emphasis on ease of use, detailed customization, and intelligent networking positions it as a robust tool for enhancing both the organizer's and the attendee's experience.

2.2 Summary

Feature	EventBrite	Cvent	Whova	Proposed System	Notes
User Authentication	✓	✓	✓	✓	Proposed system offers advanced role-based login for students, employers, and admins
Event Management	✓	✓	✓	✓	Proposed system specializes in career fair event creation with employer application process
QR Code Usage	✗	✓	✗	✓	Proposed system has extensive QR code use for information exchange, check-ins, and document access
Networking Solutions	✗	✓	✓	✓	Proposed system includes Digital Card Identity feature

					for easy information exchange
Resume Tools	✗	✗	✗	✓	Proposed system offers AI-powered resume builder and smart resume screening
Job Matching	✗	✗	✗	✓	Proposed system includes NLP-based job matching algorithm
QR code based Documentation exchange	✗	✗	✗	✓	Proposed system offers cloud-based documentation with QR code access
Questionnaire System	✓	✗	✗	✓	Proposed system has integrated questionnaire system for event join

Table 2.1 Comparison Table with existing systems

EventBrite, Cvent, and Whova each offer unique event management solutions, boasting features like robust event discovery, customizable event pages, and attendee management tools. However, they lack specific functionalities crucial for career fair environments, such as attendee-job matching algorithms using NLP and QR code technology integration. My objectives involve designing NLP algorithms for job matching, integrating QR code technology for attendee engagement, and investigating networking challenges. Therefore, objectives were created aim to enhance existing platforms, making them more tailored and effective for career fairs by implementing new technologies.

Chapter 3 System Methodology

The processes of the project were categorized into different phases in order to ensure the task was delivered smoothly.

3.0 Methodology

Figure 3.1 Process of an Agile Development Plan [7]

Figure 3.1 shows the process of an Agile Development that the project the aim to use throughout my project which will start from planning phase until to launch phase. Agile methodology is based on the Agile Manifesto, which emphasizes flexibility, customer satisfaction, collaboration, and responsiveness to change. It advocates for adaptive planning, evolutionary development, early delivery, and continuous improvement [7]. Agile encourages rapid and flexible response to changes, making it particularly effective in a dynamic project environment [7].

3.0.1 Initial Planning and Vision Setting

The project began with an Initial Planning and Vision Setting phase. During this stage, the core needs of event organizers, companies, and career fair attendees were carefully analyzed to define the project's vision and goals. A basic outline of features was created, including innovative elements like QR code integration for information access, digital identity cards for networking, and AI-powered resume and job matching. This initial planning provided a clear direction while maintaining the flexibility that is characteristic of Agile methodologies.

3.0.2 Iterative Development and Sprints

The development process was structured around Iterative Development and Sprints, typically lasting 2-4 weeks each. Each sprint began with a carefully curated backlog of tasks and features. For instance, one sprint might focus on developing the QR code integration, while another could concentrate on the digital identity card feature. This approach allowed for the gradual build-up of the application, with each sprint resulting in a potentially shippable increment of the software.

3.0.3 Regular Testing and Adaptation

Regular Testing and Adaptation were integral to the development process. As features were developed, they underwent continuous testing to identify and rectify bugs early. This was particularly crucial given the solo development nature of the project. For example, after implementing the QR code scanning feature, rigorous testing would have been conducted to ensure its functionality across various devices and scenarios, maintaining high quality throughout the development process.

3.0.4 Feedback and Reflection

At the conclusion of each sprint, a Feedback and Reflection phase took place. This involved self-reflection on the work completed and, ideally, gathering feedback from potential users. Questions such as whether the developed features met users' needs and what areas could be improved in subsequent sprints were addressed. This feedback loop was essential in ensuring that the evolving product remained aligned with user requirements and expectations.

3.0.5 Continuous Improvement and Scalability

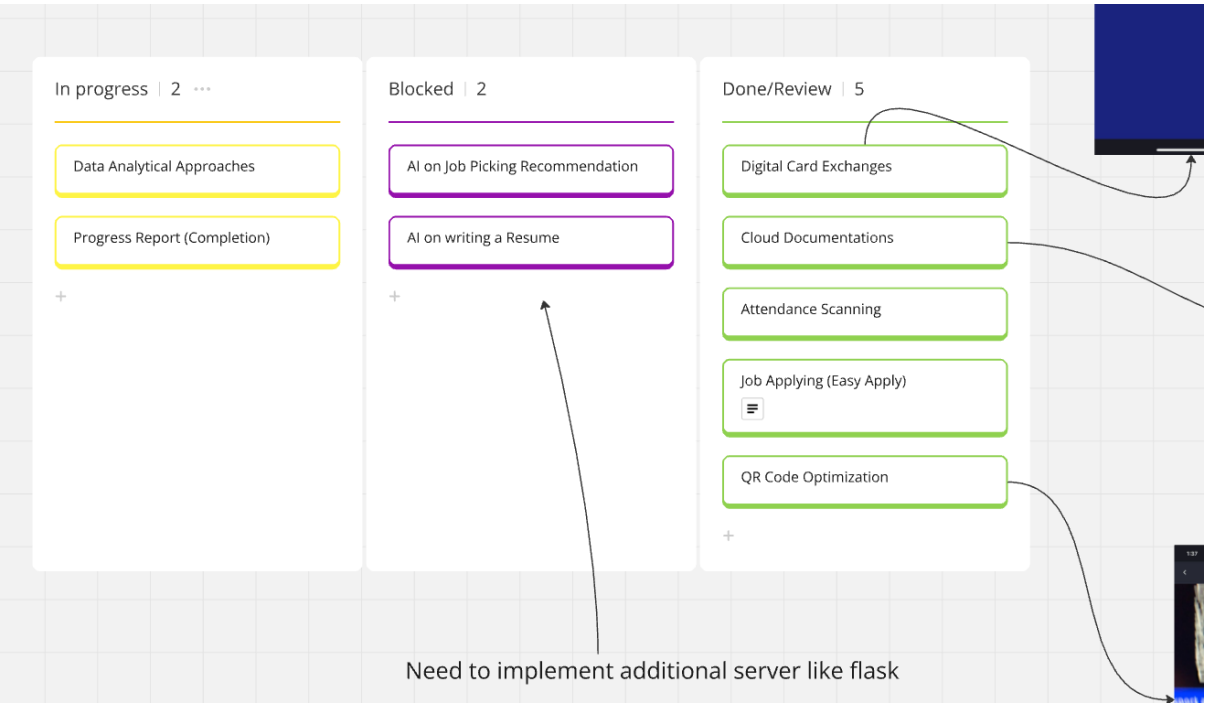


Figure 3.0.6 Kanban Board

The principle of Continuous Improvement and Scalability was applied not only to the product but also to the development process itself. Regular evaluations of workflow, tools, and practices helped identify opportunities for increased efficiency. Scalability considerations were integral from the outset, involving the selection of technologies and architectures that could support future growth in terms of user load and feature set. To facilitate this continuous improvement, a Kanban board as shown in Figure 3.0.6 was implemented to visualize the workflow and manage tasks efficiently. This Kanban approach allowed for real-time tracking of progress, identification of bottlenecks, and optimization of the development process.

3.0.6 Collaboration and Supervisor Engagement

Collaboration and Supervisor Engagement played a crucial role in the development process. Regular meetings with the supervisor provided guidance and ensured the project remained on track. The Kanban board served as a central point of discussion during these meetings, offering a clear visual representation of the project's status and upcoming tasks. This collaborative use of Kanban enhanced communication and allowed for more effective prioritization of work items.

3.0.7 Responding to Change

Finally, the Agile principle of Responding to Change was embraced throughout the project. The development process remained flexible, allowing for modifications based on new information, technological advancements, or changes in user requirements. This adaptability was vital in ensuring that the final application remained relevant and useful in the dynamic field of career fair management.

By adhering to these Agile principles, the Event Management System for Career Fair was developed as a responsive, user-centered, and adaptive application. The iterative nature of the process allowed for continuous refinement and improvement, ensuring that the final product not only met but exceeded the evolving needs of career fairs and their participants.

3.1 System Design

The system design will begin with three respective diagrams in designing the system of the mobile application.

3.1.1 Use Case Diagram

The Use Case Diagram presented herein illustrates the functional requirements and interactions within the EMA designed specifically for career fairs. This diagram serves as a visual representation of the various actors, their roles, and the functionalities they perform within the application. By delineating the system's use cases, it provides a comprehensive overview of the features and capabilities offered to different stakeholders, including attendees, companies, and organizers.

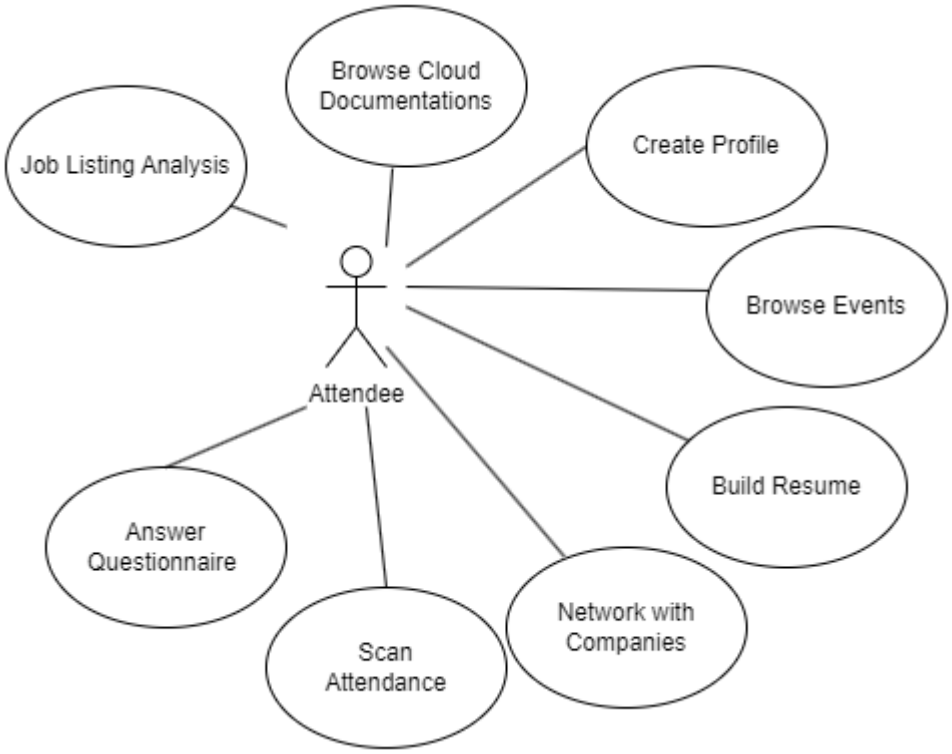


Figure 3.1.2 Attendee Use Case Diagram

Figure 3.1.2 showcases the attendee use case diagram, illustrating the various functionalities available to career fair participants. Firstly, attendees can 'Browse Events' through the application. This feature allows users to explore and discover the range of career fair events available, helping them plan their participation effectively. Furthermore, the 'Browse Events' functionality offers attendees the opportunity to browse and explore the diverse range of events and sessions available at the career fair. Next, attendees have the option to 'Create Profile' within the Event Management System (EMS). This functionality enables users to input their personal information, academic background, and career aspirations, creating a comprehensive digital identity for the career fair. The 'Build Resume' feature is a significant addition to the system. It allows attendees to construct or enhance their resumes using AI-powered tools. This smart resume builder helps users create professional, tailored resumes that highlight their skills and experiences effectively.

Following this, attendees can engage in 'Network with companies' activities. This feature facilitates direct interaction between attendees and potential employers, fostering valuable connections and information exchange during the career fair. The 'Job Listing' functionality allows attendees to browse through available job opportunities posted by participating

companies. This feature streamlines the job search process, enabling attendees to identify relevant positions aligned with their career goals.

Additionally, the 'Browse Cloud Documentation' feature provides attendees access to digital brochures and company information. By scanning QR codes, users can view detailed information about companies, enhancing their preparation for interactions and interviews. The 'Scan attendance' feature utilizes QR code technology to efficiently record attendee participation in various events and sessions. This streamlines the check-in process and helps organizers track event attendance accurately. Lastly, the 'Answer Questionnaire' functionality allows attendees to provide feedback and insights about their career fair experience. This valuable input helps organizers improve future events and tailor the experience to attendee needs.

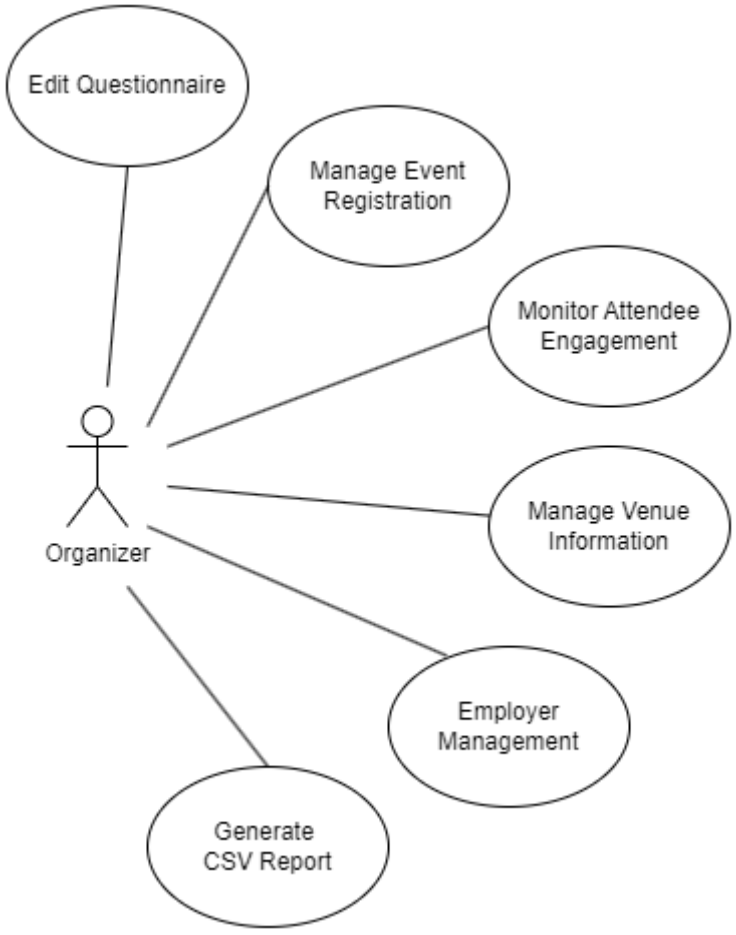


Figure 3.1.3 Organizer Use Case Diagram

Figure 3.1.3 showcases the Organizer Use Case Diagram, highlighting the key functionalities available to event organizers. One essential capability offered to organizers is the 'Manage Event Registration' feature, enabling them to oversee and control event registration processes seamlessly. This includes managing attendee sign-ups, company registrations, and ticket sales, providing organizers with comprehensive tools to track and manage event participation effectively. The 'Monitor Attendee Engagement' functionality empowers organizers to track attendee participation and engagement in real-time. By monitoring session attendance, collecting feedback, and analyzing engagement metrics, organizers can gain valuable insights into attendee behavior and preferences, facilitating informed decision-making and event optimization.

Furthermore, organizers can utilize the 'Manage Venue Information' feature to oversee venue-related details, including maps, floor plans, amenities, and directions. This ensures that attendees have access to accurate and up-to-date venue information, enhancing their overall event experience and navigation. An addition to the system is the 'Edit Questionnaire' feature. This allows organizers to create, modify, and customize questionnaires for attendees. These questionnaires can be used to gather valuable feedback, assess attendee satisfaction, and collect data for future event improvements.

The 'Employer Management' functionality is another crucial addition. It enables organizers to accept or reject employer applications to join the event. This feature ensures that only relevant and approved employers participate in the career fair, maintaining the quality and relevance of the event for attendees. Lastly, organizers can leverage the 'Generate CSV Report' functionality, specifically for attendance tracking. This feature allows organizers to export attendance data in CSV format, providing a comprehensive overview of event participation. These reports offer valuable insights into attendee demographics and engagement metrics, enabling organizers to assess event effectiveness and identify areas for improvement.

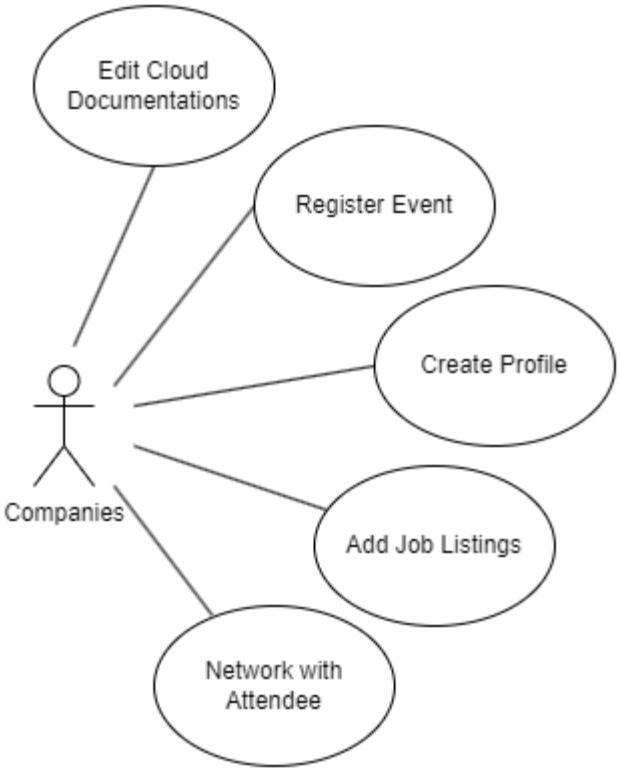


Figure 3.1.4 Company Use Case Diagram

Figure 3.1.4 shows the use case diagram for Company functionalities in the system. One of the primary features is the 'Register Event' capability, allowing companies to easily sign up for participation in the career fair through the application. This streamlined process simplifies the registration process, enabling companies to secure their presence at the event efficiently.

Moreover, companies have the opportunity to 'Create Profile' within the EMS. This feature allows them to showcase essential information such as company details, culture, and industry focus. By creating a comprehensive profile, companies can effectively present themselves to attendees, thereby increasing visibility and attracting potential candidates. A key addition to the system is the 'Add Job Listings' functionality. This feature enables companies to post and manage their current job openings directly within the platform. By providing detailed job descriptions, requirements, and application procedures, companies can effectively communicate their employment opportunities to interested attendees.

The 'Network with Attendee' feature give interactions between companies and attendees. This functionality provides communication tools, contact exchange capabilities, and interactive features, facilitating valuable connections between employers and potential candidates. It

allows companies to engage with attendees, answer questions, and build relationships during the career fair. Finally, is the 'Edit Cloud Documentations' feature. This allows companies to manage and update their digital presence within the system. Companies can upload, edit, and organize various documents such as company brochures, presentation materials, and additional resources. This ensures that attendees have access to the most up-to-date and relevant information about the company.

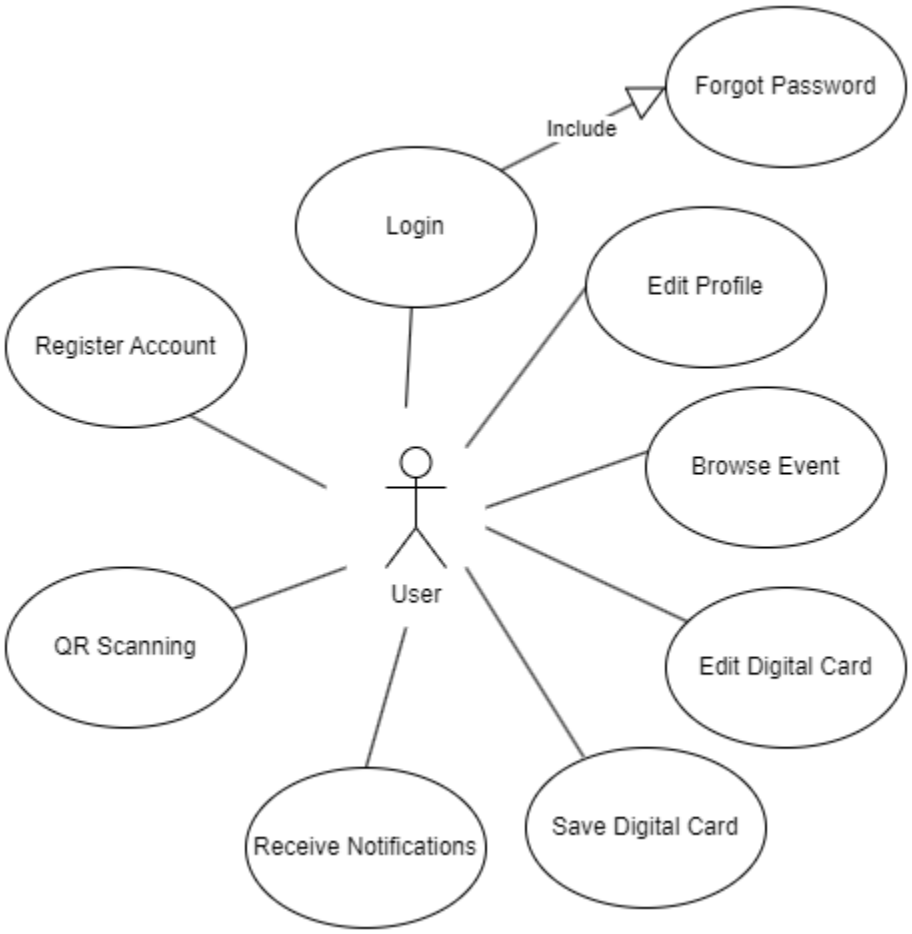


Figure 3.1.5: User Use Case Diagram

Figure 3.1.5 showcases the user flow of the system which all users will be able to access. The process begins with the "Register Account" functionality, where users can create their profiles within the system. By entering necessary details such as email, password, and potentially additional profile information, individuals become registered users, enabling them to access the application's features and functionalities securely. Subsequently, the "Login" feature

facilitates authenticated access to user accounts. Through this process, users can securely log in by providing their credentials, typically comprising their email and password. In cases where users may forget their password, the "Forgot Password" functionality, which is included in the login process, serves as a helpful tool for account recovery. By initiating an email-based password reset process, users can regain access to their accounts, ensuring uninterrupted use of the application.

Once logged into the system, users have access to several key functionalities. The "Edit Profile" feature allows users to review, modify, and update their profile information, ensuring accuracy and relevance. This provides users with autonomy and customization options, enabling them to maintain up-to-date profiles within the system. The "Browse Event" functionality offers users a comprehensive overview of all available events within the platform. Through event listings containing essential details such as event title, date, time, and location, users can explore a diverse range of opportunities, gaining insights into upcoming events and engagements.

In additions, the "Edit Digital Card" feature allows users to customize their digital business cards, which can be shared with other users during networking sessions. Along with this, the "Save Digital Card" functionality enables users to store digital cards received from other participants, facilitating easy follow-ups and connection management. The "Receive Notifications" feature keeps users informed about relevant events, announcements, and updates within the platform. Through email or in-app notifications, users receive timely and pertinent information, enhancing their engagement and participation in various events.

Lastly, the "QR Scanning" functionality has been introduced. This feature allows users to quickly scan QR codes associated with events, other users' digital cards, or informational materials, streamlining the process of information exchange and event participation.

3.2 Class Diagram

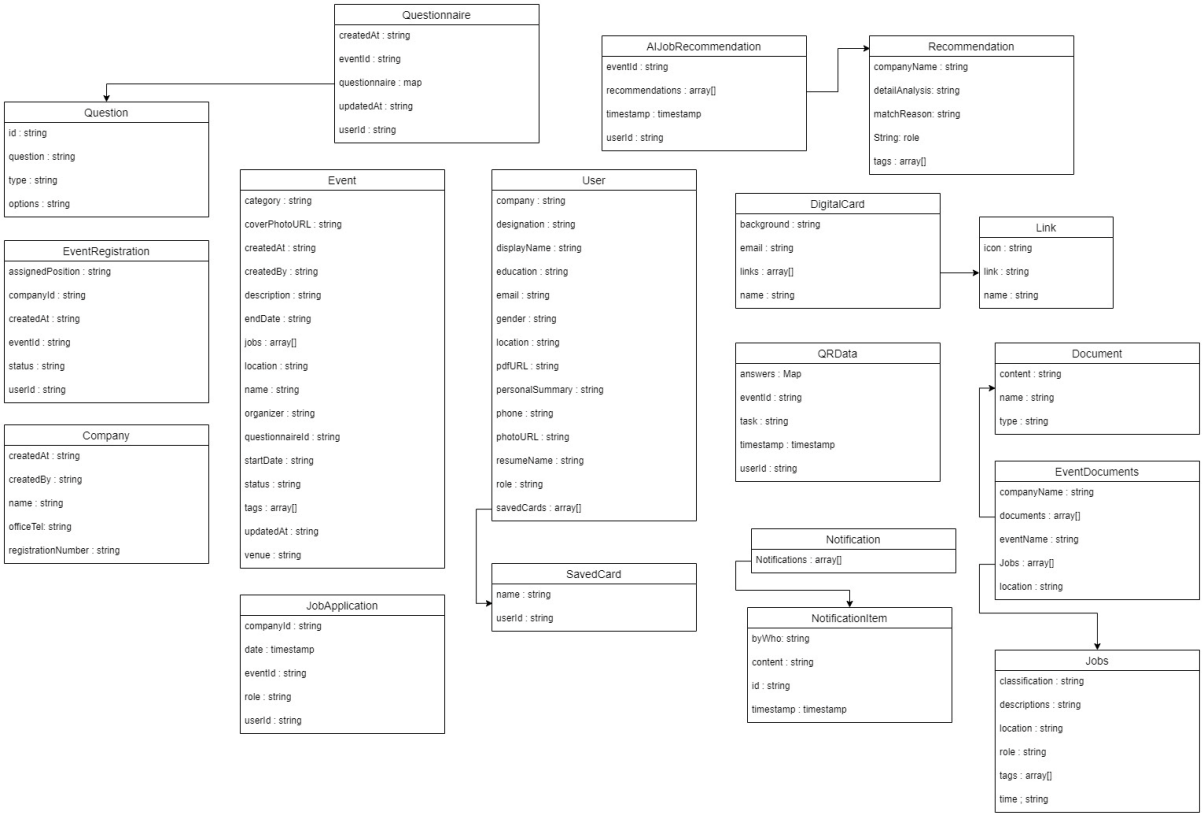


Figure 3.2 Class Diagram for Event Management System

The Figure 3.2 shown the class diagram represents the structure of a Event Management System. It illustrates the relationships between various entities in the system:

1. The central class is the Event, which contains information about career fairs. It's connected to several other classes, indicating its importance in the system.
2. User class represents different types of users (students, employers, administrators) with attributes like name, email, and role.
3. Company class likely represents employers participating in the career fair.
4. EventRegistration class manages the registration of users (likely students or companies) for events.
5. JobApplication class handles job applications submitted during or after the career fair.
6. Questionnaire and Question classes manage surveys or feedback forms for the events.
7. AIJobRecommendation and Recommendation classes suggest job matches to users based on their profiles.
8. DigitalCard and Link classes manage digital business cards exchanged during the fair.
9. QRData class likely handles QR code generation and scanning for information exchange.

10. Document and EventDocuments classes manage various documents related to the career fair and participating companies.
11. Notification and NotificationItem classes handle system notifications for users.
12. Jobs class contains information about job openings at the career fair.

3.2.1 Class Diagram Explanation

One notable feature of this diagram is the abundance of many-to-many relationships. For instance, Users can be associated with multiple Events, and Events can have multiple Users. Similarly, Companies can participate in multiple Events, and Events can host multiple Companies. This interconnected structure reflects the complex nature of career fairs, where multiple entities interact in various ways.

The reason this class diagram has so many many-to-many relationships and doesn't look like a traditional Entity-Relationship Diagram (ERD) is because it's designed to represent a NoSQL database structure, specifically for a document-oriented database like Firebase. In NoSQL databases, especially document stores, the focus is on representing data in a way that mirrors real-world entities and their interactions, rather than adhering to the strict normalization rules of relational databases.

In a NoSQL context, many-to-many relationships are often handled through embedded documents or arrays of references. This allows for more flexible and scalable data structures that can easily accommodate complex relationships without the need for junction tables or complex joins. For example, an Event document might contain an array of User IDs who are attending, while a User document might have an array of Event IDs they're participating in.

3.3 Activity Diagram

3.3.1 User Authentication and Registration

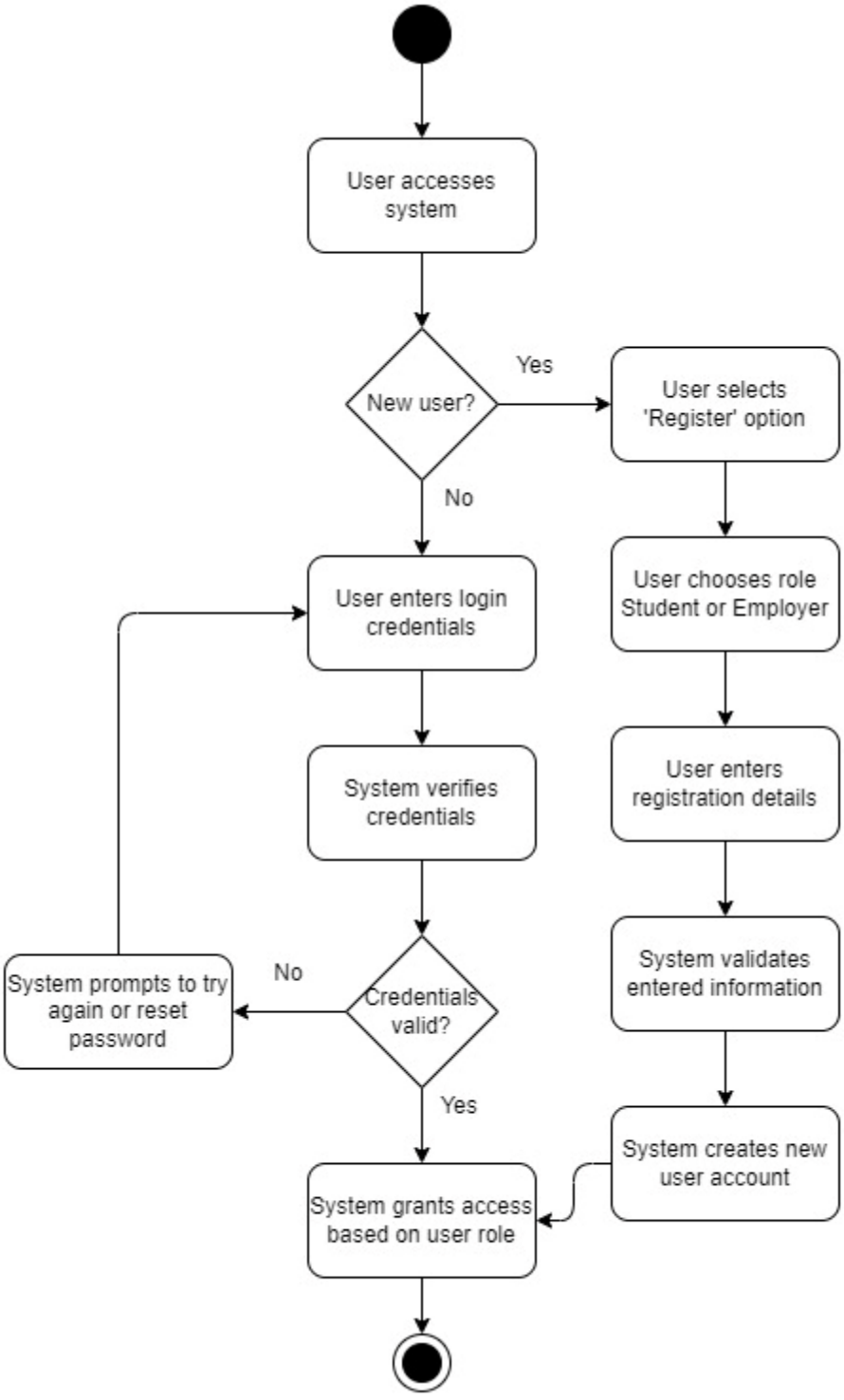


Figure 3.3.1 User Authentication and Registration Activity Diagram

Figure 3.3.1 shown the process of user authentication, it begins when a user accesses the system, either by launching the mobile application or visiting the system's website. Once the user has initiated access, the system then determines whether the user is new or existing, which branches the process into two main paths.

For new users, the first step is selecting the 'Register' option. Following this, the user chooses their role, either as a student or an Employer. Next, the user enters their registration details, which typically includes personal information, contact details, and possibly academic or company information depending on their chosen role. After the user submits this information, the system validates it to ensure completeness and correctness. If the information is deemed valid, the system proceeds to create a new user account.

On the other hand, if the user is not new, they follow a different path. First, they enter their login credentials. The system then verifies these credentials. In the event that the credentials are invalid, the system prompts the user to try again or reset their password. This verification loop continues until valid credentials are provided.

Once the credentials are successfully verified for existing users, or a new account is created for new users, the next step is granting access. The system does this based on the user's role, ensuring that each user type - whether student, employer, or administrator - has access to the appropriate features and information.

Finally, the authentication process concludes with the user gaining access to the system with the appropriate permissions for their role. This marks the completion of the process, allowing the user to proceed with using the various features of the Career Fair Management System according to their specific role and permissions.

3.3.2 Event Creation and Management

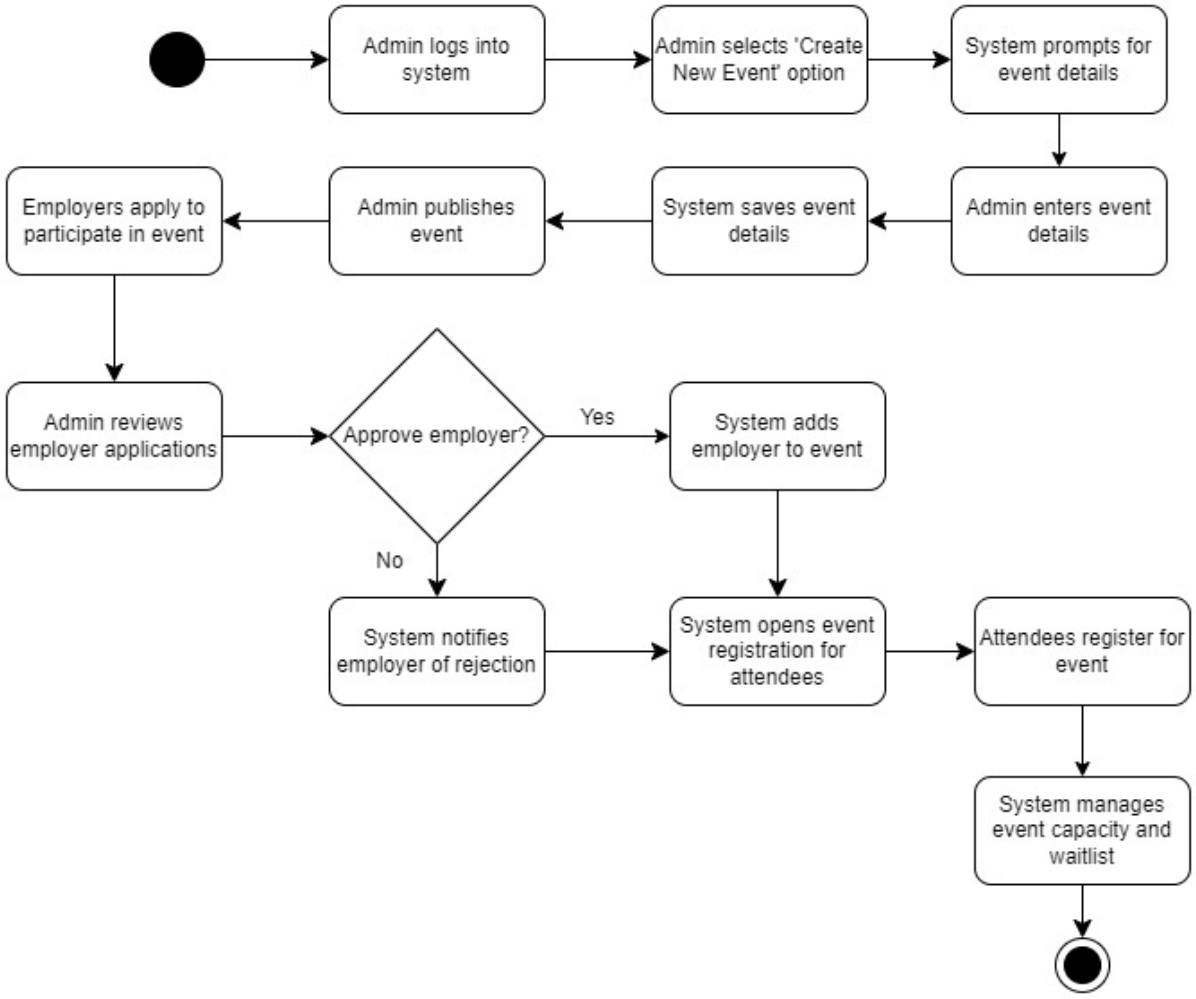


Figure 3.3.2 Event Creation and Management Activity Diagram

Based on the Figure 3.3.2, the process begins with an administrator logging into the system. Once logged in, the admin selects the 'Create New Event' option. The system then prompts the admin to enter event details, which may include information such as the event date, time, location, and any specific requirements.

After the admin enters the event details, the system saves this information. The admin then publishes the event, making it visible to potential participants. At this point, employers can apply to participate in the event.

When employer applications are received, the admin reviews each application. The admin then decides whether to approve or reject each employer. If an employer is approved, the system adds them to the event. If rejected, the system notifies the employer of the rejection.

Once the employer approval process is complete, the system opens event registration for attendees. This allows students and other interested parties to register for the event As attendees register, the system manages the event capacity and waitlist. This ensures that the event doesn't become overbooked and allows for efficient management of attendee numbers.

3.3.3 QR Code Generation, Scanning and Digital Identity Exchange Activity Diagram

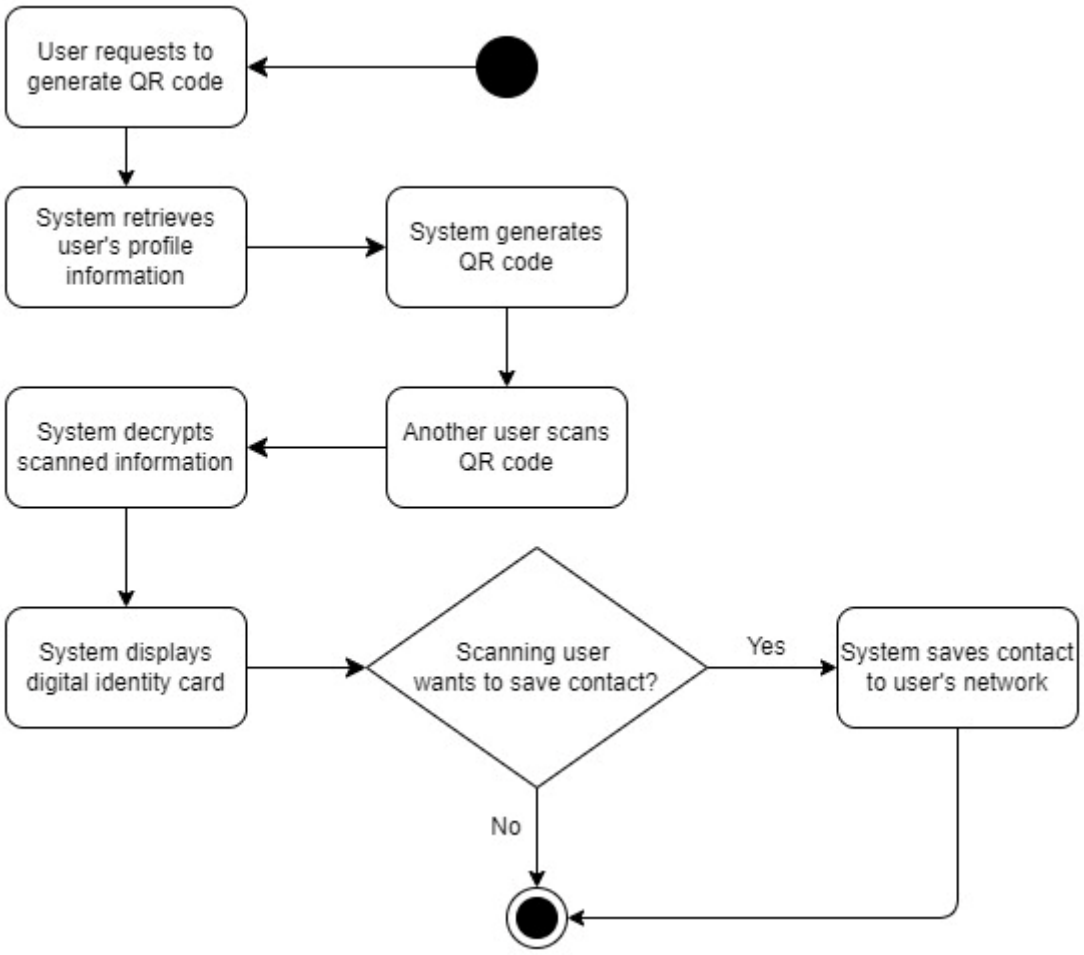


Figure 3.3.3 QR Code Generation, Scanning and Digital Identity Exchange Activity Diagram

Figure 3.3.3 showcase the qr code and digital card exchange part, the process begins when a user requests to generate a QR code. This action l occurs within the app's interface, perhaps through a dedicated button or menu option. Once the request is made, the system retrieves the user's profile information. This step ensures that the QR code will contain up-to-date and accurate information about the user.

Using the retrieved profile information, the system then generates a unique QR code. This code includes with the user's relevant details in an encrypted format, ensuring data privacy and security. The QR code can then be scanned by another user of the system. When this occurs, the scanning user's device reads the encrypted information contained in the QR code.

Next, the system decrypts the scanned information, converting it back into a readable format. This decryption process is crucial for maintaining the security of user data during the exchange. Once decrypted, the system displays the information as a digital identity card. This card likely contains key details about the user whose QR code was scanned, such as their name, role (student or employer), and possibly contact information.

At this point, the scanning user is presented with an option to save the contact. If they choose to save it, the system adds the contact information to the user's network within the app. If they decide not to save it, the process ends without storing the information.

3.3.4 Cloud Documentation and Resume Submission Activity Diagram

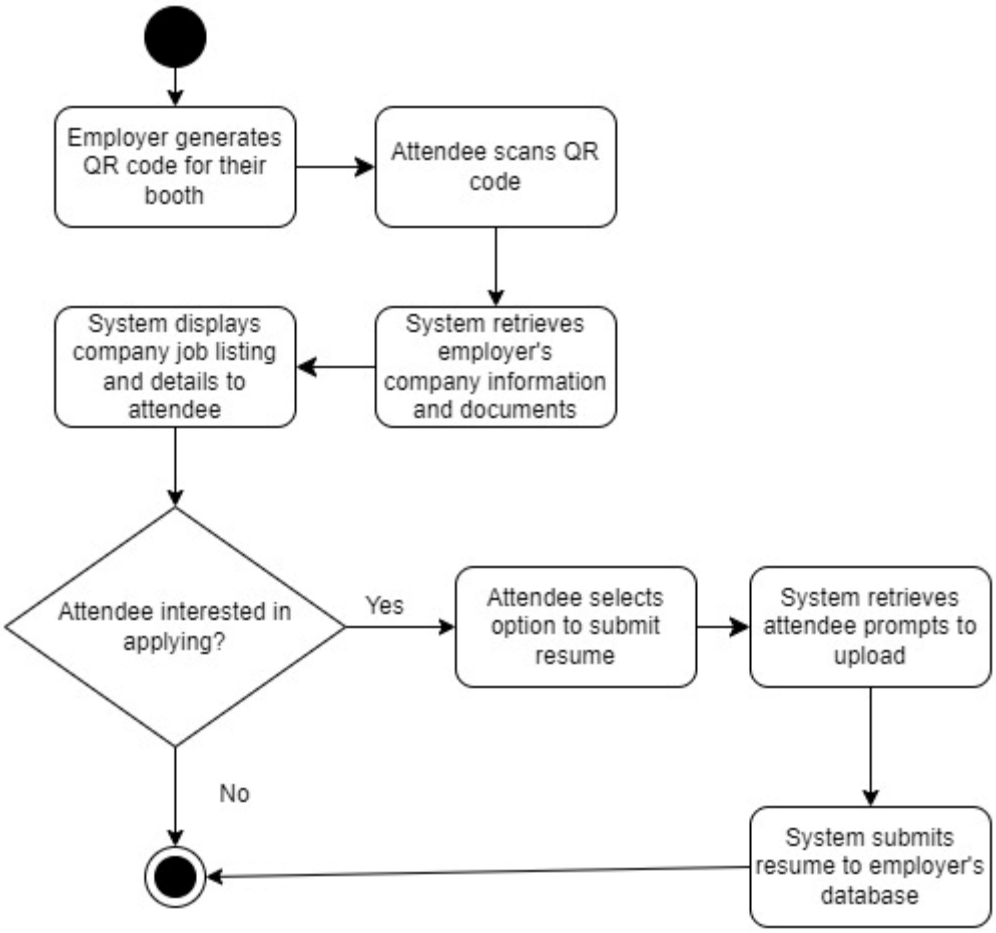


Figure 3.3.4 Cloud Documentation and Resume Submission Activity Diagram

The Figure 3.3.4 show the activity diagram of documentation exchanges process, it start with an employer creating a unique QR code for their booth, which encodes essential information about the company and its presence at the career fair. Next, an attendee, typically a student or job seeker, uses the system's mobile application to scan the QR code at the employer's booth. This action triggers the information retrieval process. Upon scanning, the system will access and retrieves the employer's company information and relevant documents from its database. This retrieved data may include detailed company profiles, current job listings.

Following the information retrieval, the system displays the company's job listings and other details directly on the attendee's device. This allows attendees to quickly assess potential employment opportunities without the need for printed materials or lengthy conversations, streamlining the initial interaction process. At this point, the attendee reaches a decision-making stage. Based on the information presented, they determine whether they're interested in applying for a position with the company. If the attendee finds the opportunities appealing, the system provides a convenient option within the app to submit their resume. When an attendee chooses to submit their resume, the system prompts them to upload it. This adaptability ensures that attendees can always present their most current and relevant information to potential employers.

3.3.5 Job Listing Smart Screening Activity Diagram

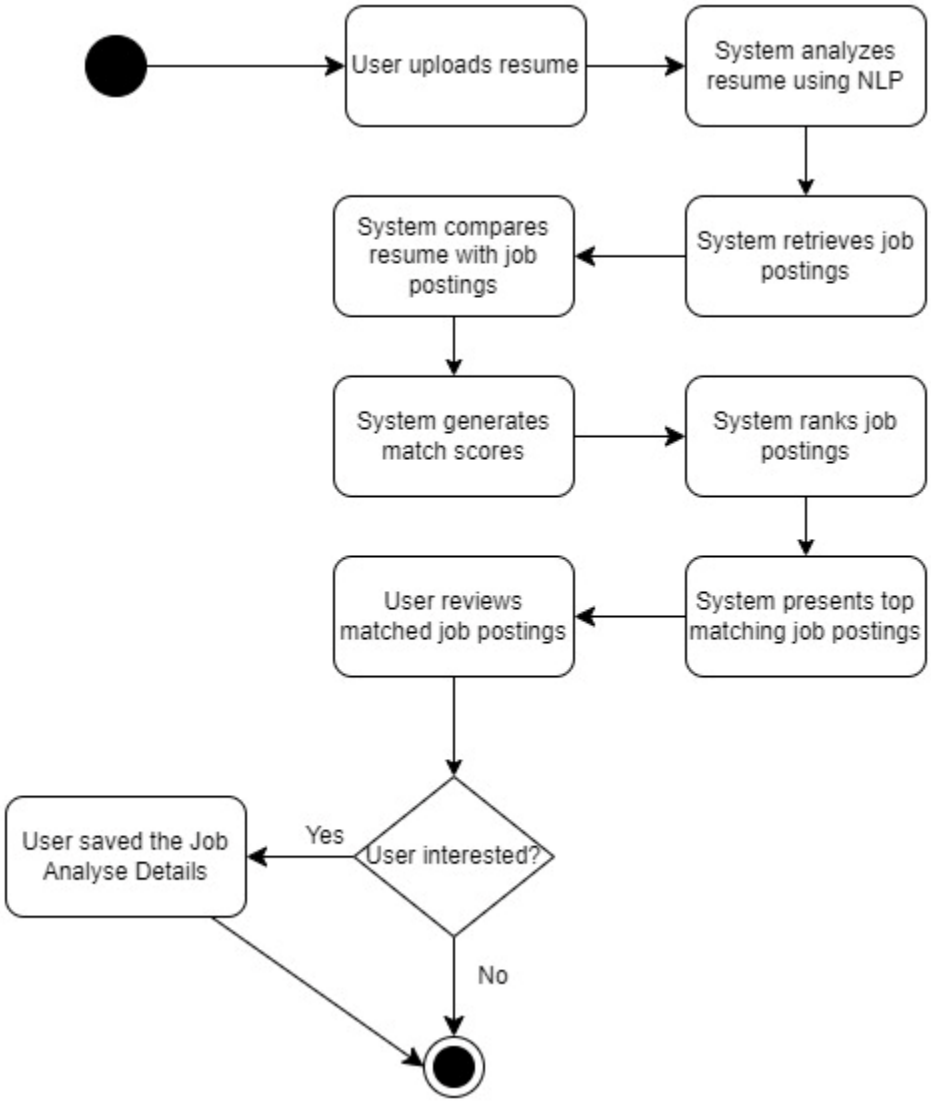


Figure 3.3.5 Job Listing Smart Screening Activity Diagram

Based on the Figure 3.3.5, First, the process begins when a user uploads their resume to the system. Next, the system analyzes the uploaded resume using Natural Language Processing (NLP) techniques. This step likely involves extracting key information such as skills, experience, and qualifications from the resume. After analyzing the resume, the system retrieves job postings from the career fair event. These job postings are stored in the system's database using Firebase Firestore as mentioned in the technology stack.

Then, the system compares the analyzed resume with the retrieved job postings. This comparison is likely based on matching keywords, skills, and other relevant criteria between the resume and job requirements.

Following the comparison, the system generates match scores for each job posting. These scores indicate how well the user's resume aligns with each job opportunity.

Based on these match scores, the system then ranks the job postings. This ranking helps prioritize the most suitable opportunities for the user. After ranking, the system presents the top matching job postings to the user. This presentation likely includes details about each job and its match score.

The user then reviews these matched job postings, allowing them to explore the opportunities that the system has determined are most relevant to their profile. Finally, the user decides whether they're interested in any of the presented job opportunities. If they are interested, they can save the job analysis details for future reference. If not, the process ends, and the user can potentially start a new search or modify their resume for better matches.

3.4 Timeline

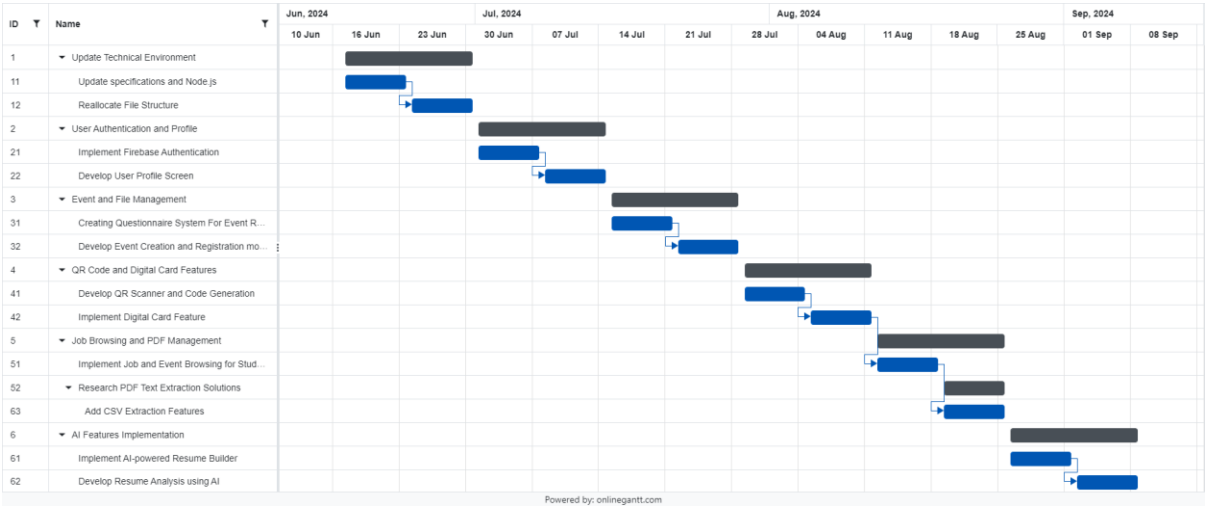


Figure 3.4.1 Gantt Chart for FYP Progression

ID	Name	Start Date	End Date
1	Update Technical Environment	Jun 17, 2024	Jun 30, 2024
11	Update specifications and Node.js	Jun 17, 2024	Jun 23, 2024
12	Reallocate File Structure	Jun 24, 2024	Jun 30, 2024
2	User Authentication and Profile	Jul 01, 2024	Jul 14, 2024
21	Implement Firebase Authentication	Jul 01, 2024	Jul 07, 2024
22	Develop User Profile Screen	Jul 08, 2024	Jul 14, 2024
3	Event and File Management	Jul 15, 2024	Jul 28, 2024
31	Creating Questionnaire System For Event Registration	Jul 15, 2024	Jul 21, 2024
32	Develop Event Creation and Registration modules	Jul 22, 2024	Jul 28, 2024
4	QR Code and Digital Card Features	Jul 29, 2024	Aug 11, 2024
41	Develop QR Scanner and Code Generation	Jul 29, 2024	Aug 04, 2024
42	Implement Digital Card Feature	Aug 05, 2024	Aug 11, 2024
5	Job Browsing and PDF Management	Aug 12, 2024	Aug 25, 2024
51	Implement Job and Event Browsing for Students	Aug 12, 2024	Aug 18, 2024
52	Research PDF Text Extraction Solutions	Aug 19, 2024	Aug 25, 2024
63	Add CSV Extraction Features	Aug 19, 2024	Aug 25, 2024
6	AI Features Implementation	Aug 26, 2024	Sep 08, 2024
61	Implement AI-powered Resume Builder	Aug 26, 2024	Sep 01, 2024
62	Develop Resume Analysis using AI	Sep 02, 2024	Sep 08, 2024

Figure 3.4.2 Detailed Task Information

Chapter 4 System Design

4.1 System Block Diagram

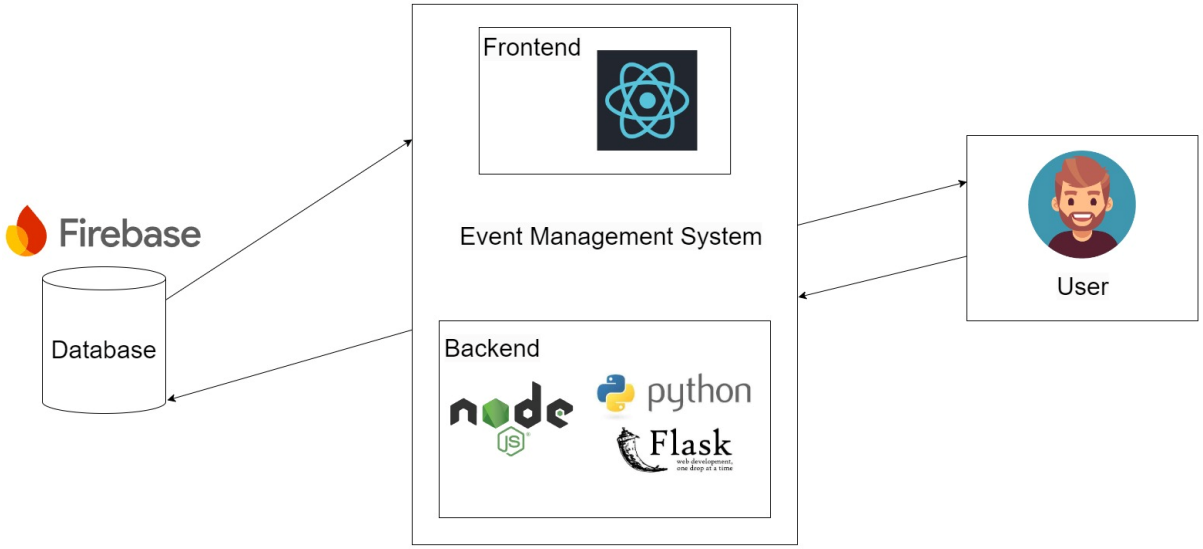


Figure 4.1 Block Diagram

For this project, the choice of cloud-based applications, particularly Firebase as the database solution, was made based on the considerations outlined in Figure 3.2.1. Firebase offers robust capabilities and a seamless setup process, eliminating the need for configuring a SQL server. Its NoSQL database structure, which allows for flexible data management using JSON, aligns perfectly with the requirements of the Event Management Application. The primary reason for opting for Firebase is its ease of setup. Unlike traditional SQL databases, Firebase doesn't require intricate configurations or maintenance, allowing more focus on application logic rather than database management tasks. Furthermore, Firebase provides real-time data synchronization, ensuring immediate updates across all connected devices, which is crucial for an Event Management Application where quick updates and seamless communication are essential.

In terms of front-end development, React Native was chosen for its versatility and efficiency. Utilizing React Native enables building a single codebase compatible with both iOS and Android platforms, significantly reducing development time and costs while ensuring a consistent user experience across devices. React Native's hot reloading feature expedites the iteration process, facilitating rapid prototyping and testing, making it an excellent choice for building Minimum Viable Products (MVP).

For the backend infrastructure, Node.js emerges as the ideal choice due to its non-blocking, event-driven architecture, which is well-suited for handling asynchronous operations like processing user requests and interacting with the Firebase database. Node.js ensures optimal performance and scalability, crucial for handling varying levels of user activity during peak times such as career fairs. On the other hand, Python Flask server is implemented to handle all the data processing and AI-related tasks. Flask, being a lightweight and flexible framework, is an excellent choice for building the RESTful API that will serve as the bridge between the frontend and the backend services. Its simplicity and extensive library support make it ideal for rapid development and easy integration of AI and machine learning functionalities.

4.2 System Requirements

The hardware involved for the development of the Event Management Mobile Application System; the hardware setup is a critical component of the system design. The primary hardware used in this project includes a laptop and an iOS mobile device.

Description	Specifications
Model	Apple Iphone XR
Processor	Apple A12 Bionic chip, Hexa-core 2490 MHz.
Operating System	IOS
Display	6.1 inches Liquid Retina IPS LCD, 1792 × 828 px resolution.
Memory	3GB
Storage	256GB

Table 4.2.1 Specifications of smartphone

Description	Specifications
Model	Dell Inspiron 15 7577
Processor	Intel Core i5-7300HQ
Operating System	Windows 10
Graphic	NVIDIA GeForce GTX1080 4GB DDR3
Memory	8GB DDR4 RAM
Storage	1TB SATA HDD + 256 NVME SSD 970

Table 4.2.2 Specifications of laptop

4.2.1 Frontend Development - React Native with TypeScript/Javascript

React Native allows for the development of a cross-platform mobile application, ensuring accessibility on both Android and iOS devices. This aligns with the objective of providing a universally accessible application [11].

TypeScript (or JavaScript) will be used to write robust and scalable code. TypeScript offers strong typing, which can help prevent many potential runtime errors during development, improving the app's overall reliability [12].

4.2.2 Backend and Database – Firebase, Python and Node.js

Firebase offers a suite of cloud services, including a real-time database and authentication services, which are crucial for features like user account management and real-time updates for event schedules [13]. Firebase's Firestore database is used to store and retrieve data in real-time, which is vital for features like collaborative tools for institutions and the comprehensive scheduling module [13].

Node.js is an asynchronous, event-driven JavaScript runtime optimized for creating scalable network applications [17]. Therefore, will be the main backend the entire mobile application structure, it will be responsible to the build and compile the application. On the other hand, Python, a high-level programming language [18] will be used for backend language during the development, this approach is to integrates with a library called Flask that serve its purpose in building a backend server and thus the ability to integrates with custom API with the Nodejs.

Chapter 5 System Setup

5.1 Software Setup

Mobile application will be more on software setting up to build the system and for the phone, it can be set up by installing an application to bridge with the expo server in a bundle.

5.1.1 Node.JS Installation

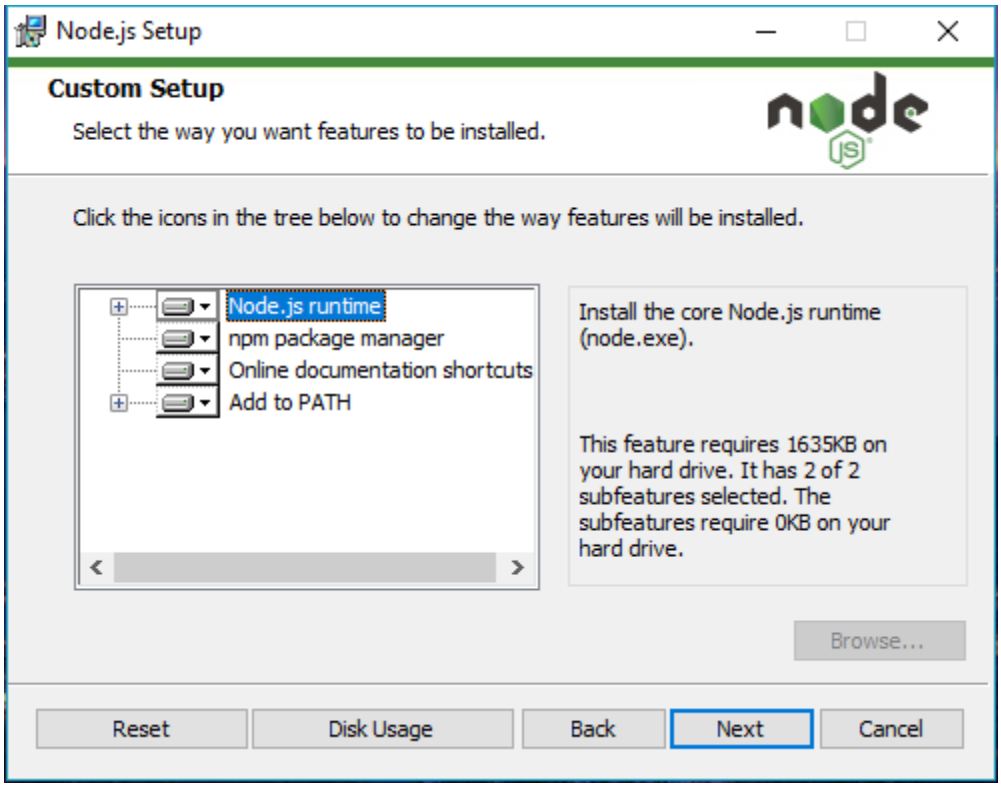


Figure 5.1.1 Node JS Installation

The first step in setting up the system is to install Node.js on a Windows. Users should navigate to the official Node.js website. On the site, options for different versions are available. It's recommended to choose the LTS (Long Term Support) version for stability. After clicking the download button for Windows, an installer file will be received.

Running the installer initiates the installation process as shown in Figure 5.1.1. During installation, several options are presented. While it's generally safe to accept the default settings, it's crucial to ensure the option to add Node.js to the PATH is selected. This allows Node.js to be run from any command prompt.

Upon completion of the installation, verification can be done by opening a command prompt and typing "node --version". If installed correctly, this command will display the version number of Node.js on the system. The system is using version 18.x for the development which is compatible with the Expo version 51.

5.1.2 Expo Installation

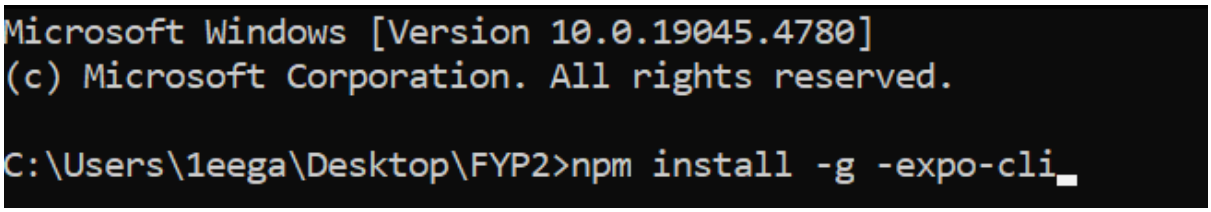


Figure 5.1.2 Expo Installation on command prompt

After successfully installing Node.js, the next step is to install Expo, which will be used to develop and run the React Native application. Expo can be easily installed using npm (Node Package Manager), which comes bundled with Node.js.

To install Expo, a command prompt should be opened and the following command typed:

npm install -g expo-cli

The "-g" flag in this command ensures that Expo is installed globally on the system as shown in Figure 5.1.2, making it accessible from any directory. Once the installation is complete, verification can be done by typing "expo --version" in the command prompt. This should display the version number of Expo installed on the system.

5.1.3 Vscode Installation

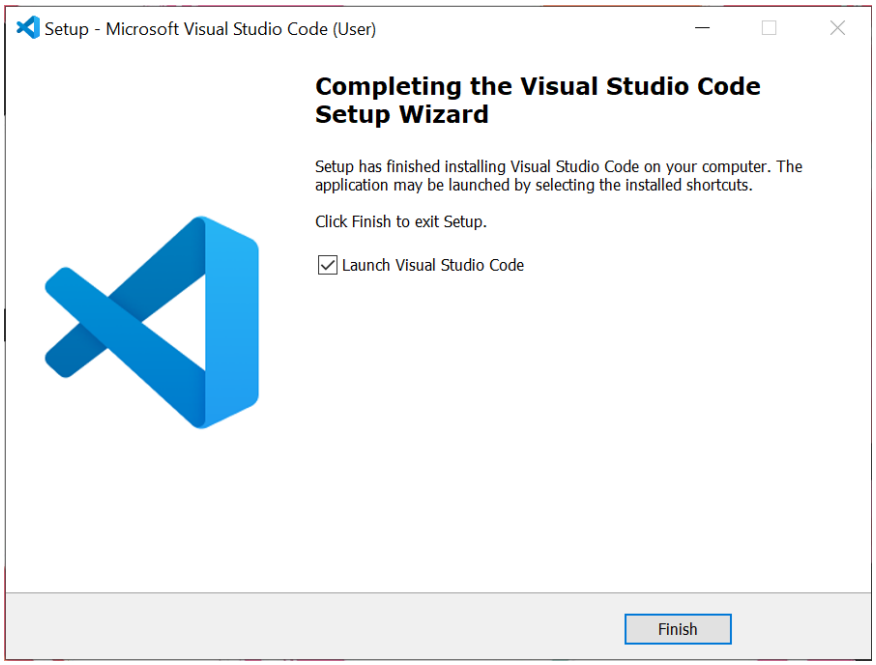


Figure 5.1.3 VSCode Installation

For coding and development, Visual Studio Code (VSCode) will be used. To install VSCode on Windows, the official Visual Studio Code website should be visited. On the homepage, a download button for Windows is available. Clicking on it will download the installer.

Once the download is complete, running the installer begins the installation process. The installation process for VSCode is straightforward. Generally, the default options can be accepted, but it's important to select the option to "Add to PATH" during installation. This allows VSCode to be opened from the command line. After installation, VSCode can be launched from the Start menu or by typing "code" in the command prompt.

5.1.4 Firebase Setup

The next step is to set up Firebase for the project. This process begins by navigating to the Firebase Console in a web browser. A Google account is required for this step.

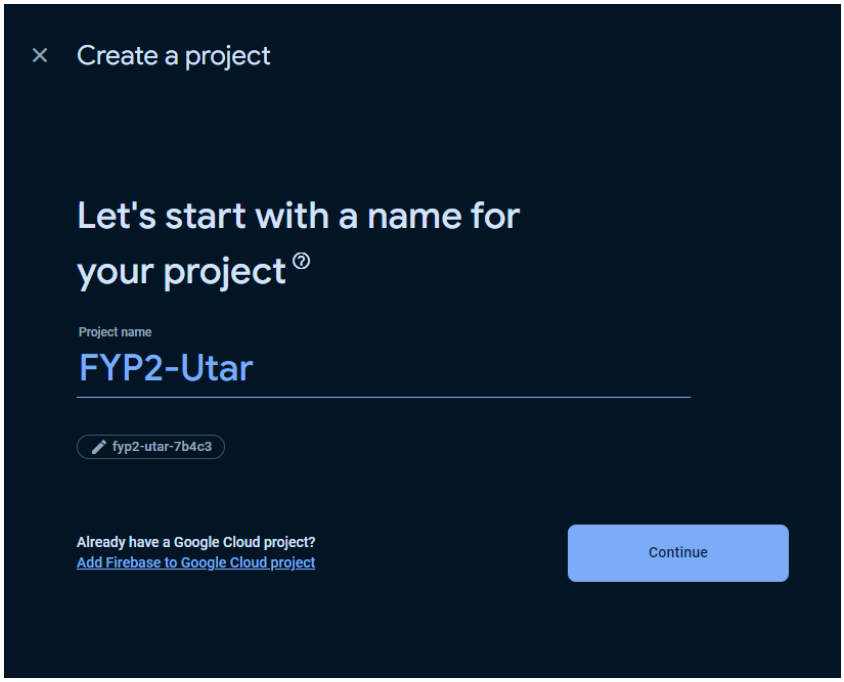


Figure 5.1.4 Create Project

Once logged in, clicking on "Add project" creates a new Firebase project. After naming the project and following the prompts to set it up, the project dashboard will be displayed.

From the dashboard, clicking on "Add app" and selecting the web platform (</>) begins the app registration process. Following the instructions provides a configuration object that includes the Firebase credentials. This information should be saved as it's needed to connect the app to Firebase.

5.1.5 Python Server Installation

For the backend server, Python with Flask will be used. First, Python should be installed on the system if it isn't already. It can be downloaded and installed from the official Python website. Once Python is installed, a command prompt should be opened, and a new virtual environment created for the Flask project:

python -m venv myenv

The virtual environment is then activated:

myenv\Scripts\activate

Now, Flask can be installed using pip:

pip install flask

5.2 Setting and Configuration

After installing all the necessary software, a few additional configurations need to be made to ensure smooth development and testing of the application.

5.2.1 Route Server Network Setup

When developing a React Native application with Expo, issues may arise when connecting a phone (for testing) to the development server if localhost is being used. To resolve this, the server needs to be bound to the computer's IP address on the local network.

To do this, a PowerShell window should be opened, and the following command entered:

$Env:REACT_NATIVE_PACKAGER_HOSTNAME="Your IP address"

"Your IP address" should be replaced with the actual IP address on the local network. This can be found by running "ipconfig" in the command prompt and looking for the IPv4 Address under the network adapter.

If issues are encountered when starting the virtual environment server due to execution policy restrictions, the execution policy may need to be changed. PowerShell should be opened as an administrator and the following command run:

set-executionpolicy remotesigned

This allows local scripts to be run, including the activation script for the virtual environment.

5.2.2 Gemini API Setup

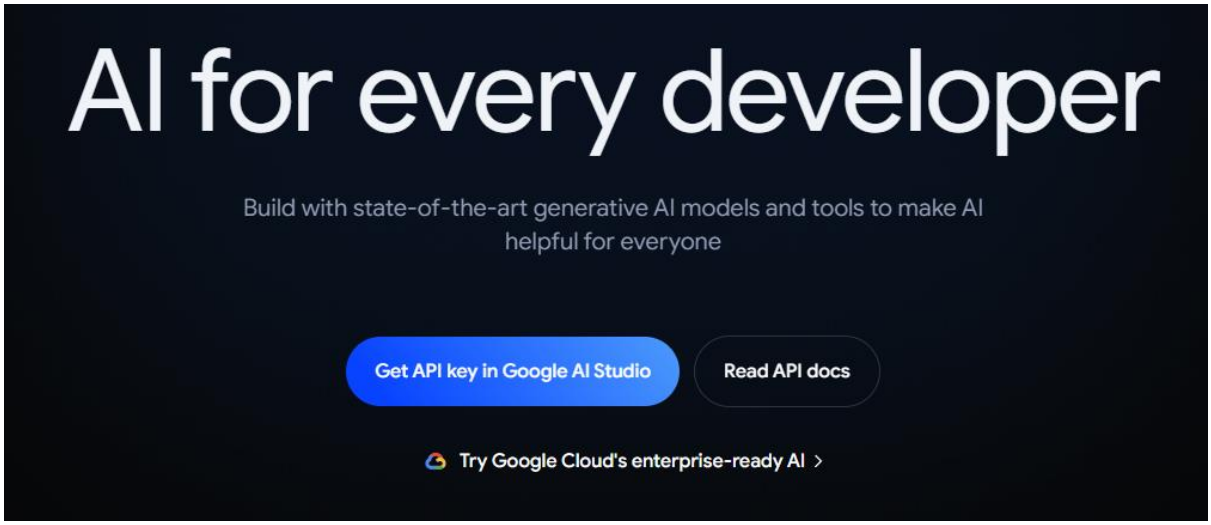


Figure 5.2.2 Gemini Studio

Figure 5.2.2 showcase the Gemini studio where it will be used for integration of generative AI with the AI resume builder and smart job listing screening features. Firstly, let's introduce Gemini, Google's latest and most capable AI model. Gemini is designed to be multimodal, understanding and generating text, code, audio, image, and video. It was announced by Google in December 2023 and has since been integrated into various Google products and services. [19]

Next, we'll set up Node.js to use Gemini. To begin, you'll need to install the Google AI Node.js client library. Open project terminal and run:

npm install @google/generative-ai

After that, for the python, Gemini library will be installed with the command:

pip install google-generativeai

Once both server had installed Gemini API library, the gemini can be run in both environment smoothly.

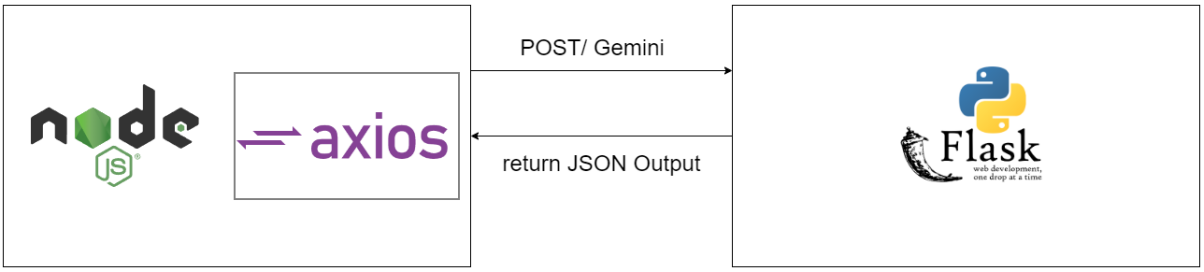


Figure 5.2.3 Node.js and Python Flask Server Communication

After that to facilitate communication between the Node.js frontend and the Python Flask backend using Gemini as shown on Figure 5.2.3, RESTful API will be implemented. On the Node.js side, Axios library which is a HTTP library that allows developers to send requests to their own server or a third-party server to retrieve data [20], will be used to make POST requests to our Flask backend.

5.3 Key Features Implementation

This part will discuss about the implementation of each functionality. While the application includes a lot of screens and user interfaces, this section will focus on the core functionalities and their implementation instead of each individual screens.

5.3.1 User Authentication and Registration

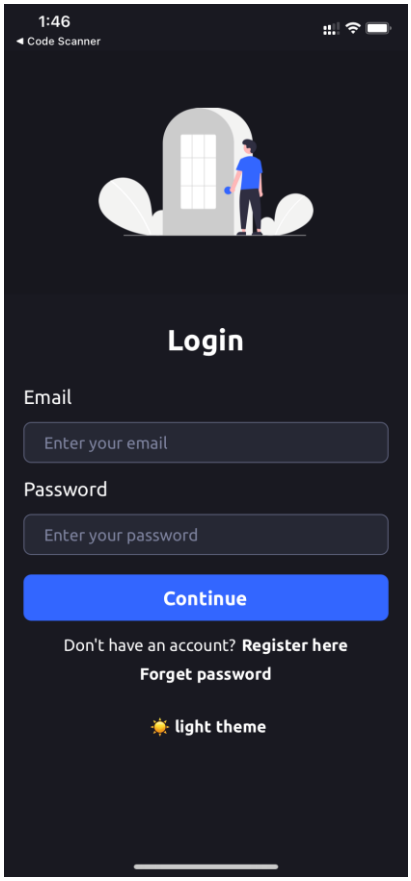


Figure 5.3.1.1 Login Screen

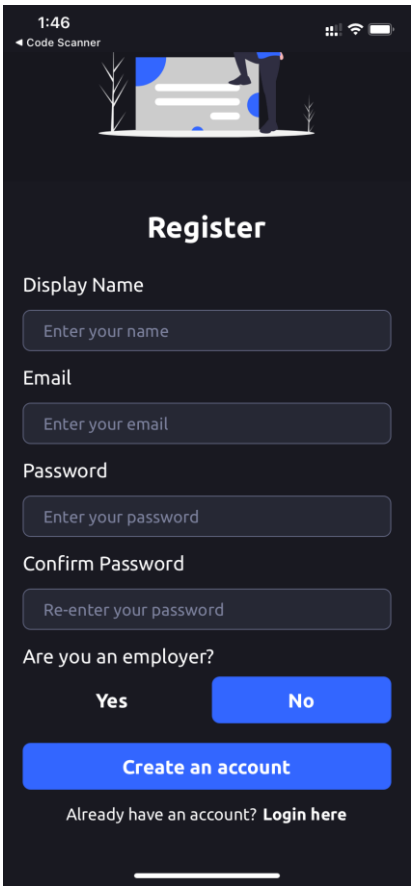


Figure 5.3.1.2 Register screen

Figure 5.3.1.1 displays the login screen of the application where users can enter their email address and password to access their account. Figure 5.3.1.2 shows the registration screen where new users can input their personal information. Importantly, this screen determines whether the user is an employer or a student. After filling in the required fields, users can create their account.

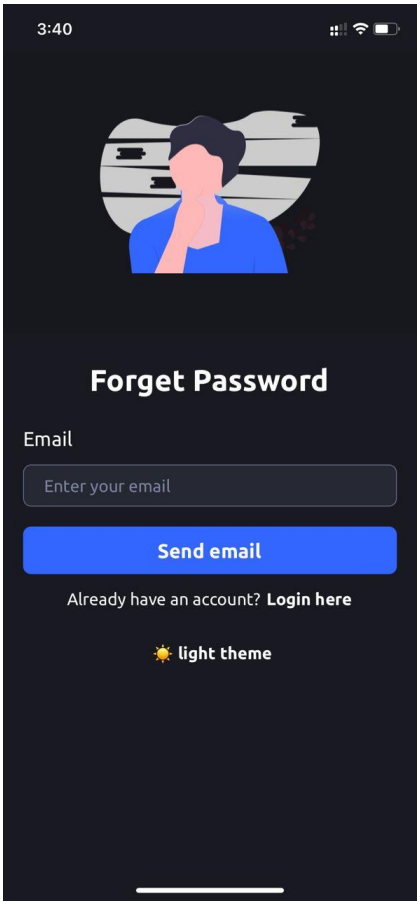


Figure 5.3.1.3 Forget Password Page

Figure 5.3.1.3 showcases the password recovery page. If users forget their password, they can reset it using their email address. The Firebase authentication system will then send a password reset link to the user's email.

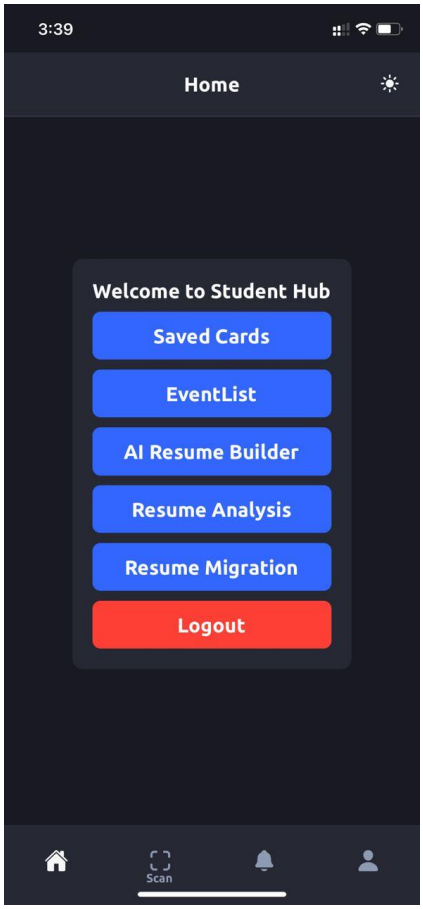


Figure 5.3.1.4 Student Screen

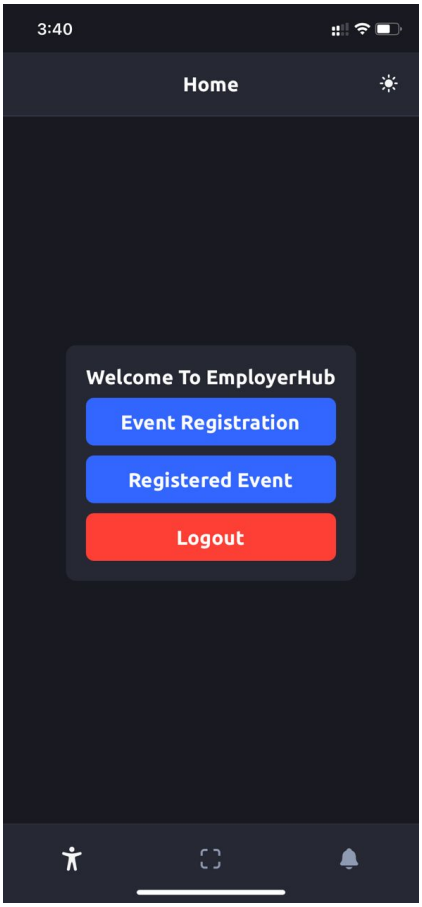


Figure 5.3.1.5 Employer Screen

After registration and role selection, the app directs users to their respective dashboards. Figure 5.3.1.4 displays the student dashboard, while Figure 5.3.1.5 shows the employer dashboard. Each role has access to different functionalities according to their needs.

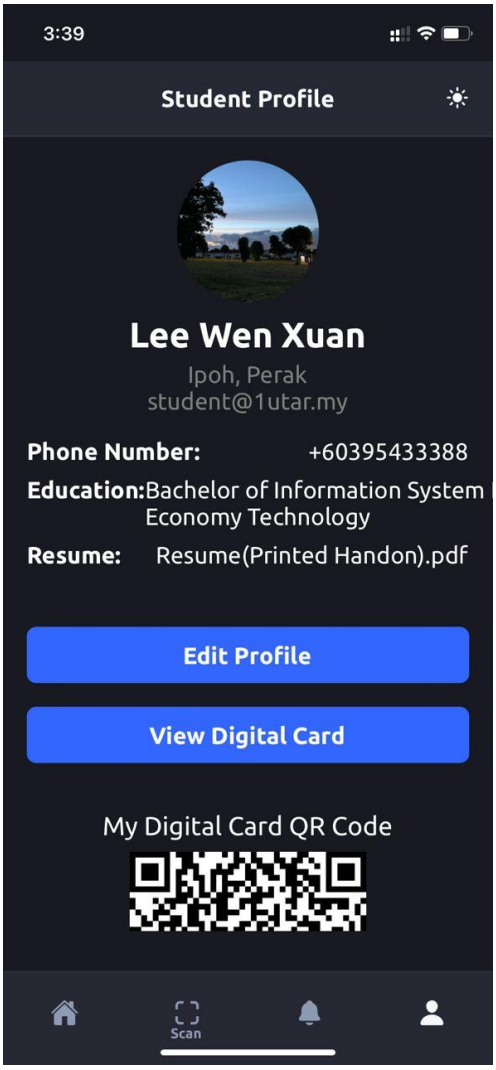


Figure 5.3.1.6 Profile Screen

Figure 5.3.1.6 presents the profile completion screen. Here, users can fill in additional details such as education history, phone number, and upload their resume after initial registration.

5.3.2 Event Creation and Management

Event creation and management is a multi-step process involving different user roles. To begin, administrators or hosts can create new career fair events, specifying details such as date, time, and location. Next, employers can apply to participate in these events. Once approved, they can set up their virtual booths or profiles. Finally, students can browse upcoming events and register to attend. This feature streamlines the organization of career fairs, making it easier for all parties to participate effectively.

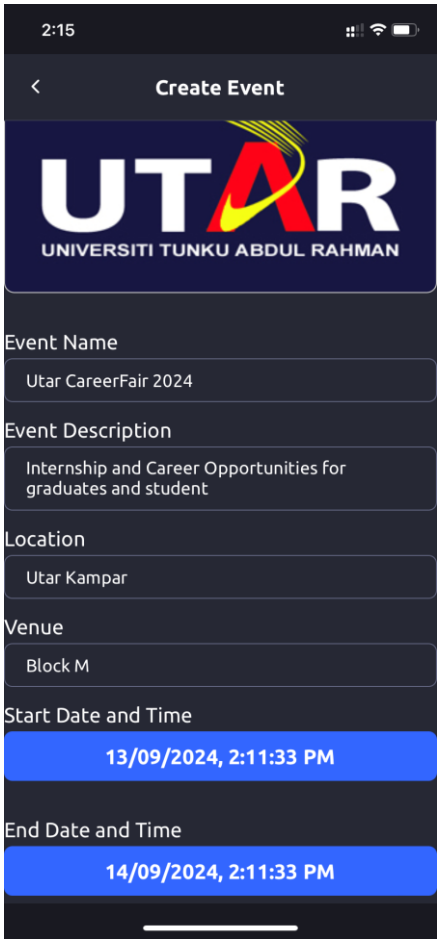


Figure 5.3.2.1 Event Creation

Figure 5.3.2.1 illustrates the event creation and management interface where organizers can host and create new events.

Figure 5.3.2.2 Employer Fair Registration

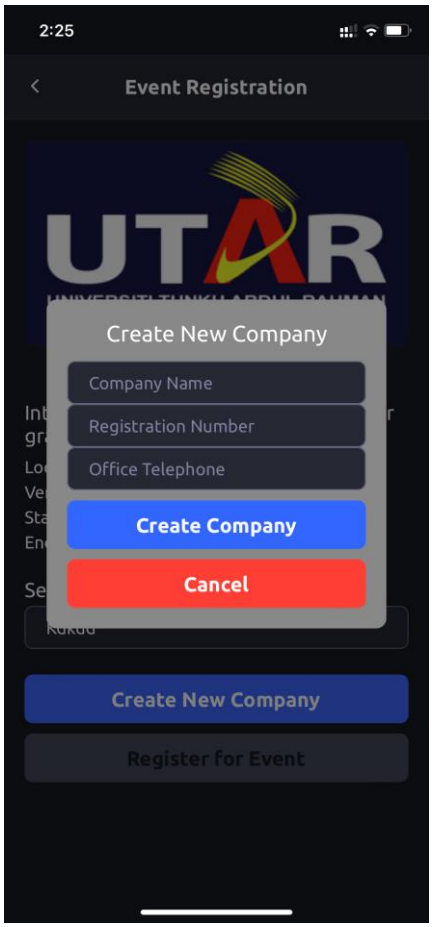
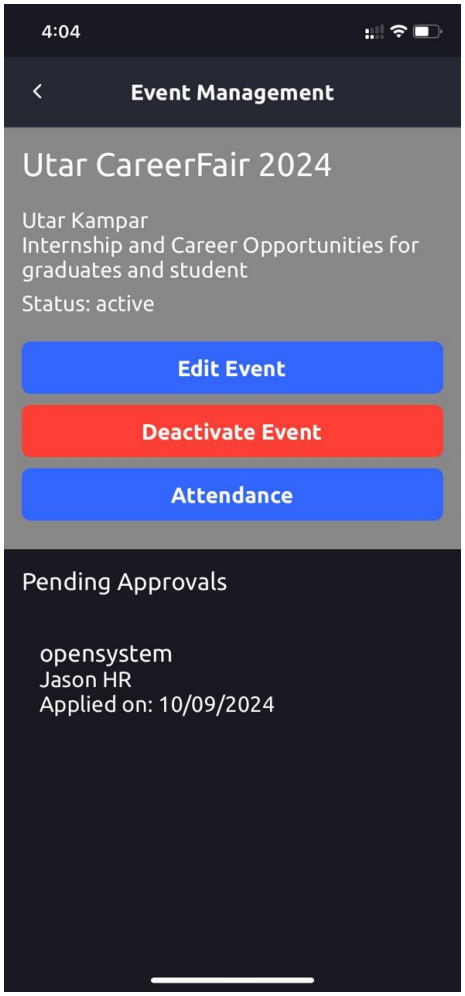


Figure 5.3.2.3 Create Company

Once an event is created, employers can register for it as shown in Figure 5.3.2.2. If an employer's company is not listed, they can create a new company profile by clicking on the "Create Company" button, as demonstrated in Figure 5.3.2.3.



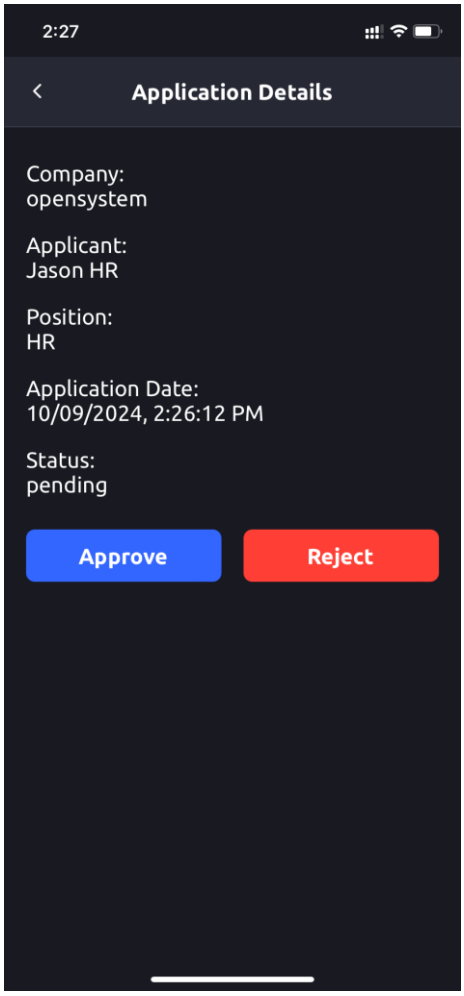


Figure 5.3.2.4 Event Management

Figure 5.3.2.5 Employer Application

After employer registration, the host/organizer can access the event management screen on Figure 5.3.2.4 to review and process pending approvals. The organizer can view application details and either approve or reject them, as shown in Figure 5.3.2.5.

Figure 5.3.2.6 Even Details Screen

Figure 5.3.2.6 displays the Event Details screen. This screen shows all the created events to students, allowing them to apply and join events of their interest. The page lists all relevant details about each event.

5.3.3 QR Code Generation and Scanning

The system utilizes QR code technology to enhance the efficiency of information exchange during career fairs. First, unique QR codes are generated for various purposes, such as event check-in, booth visits, or information sharing. Users can then scan these QR codes using their mobile devices, enabling quick and contactless interactions.

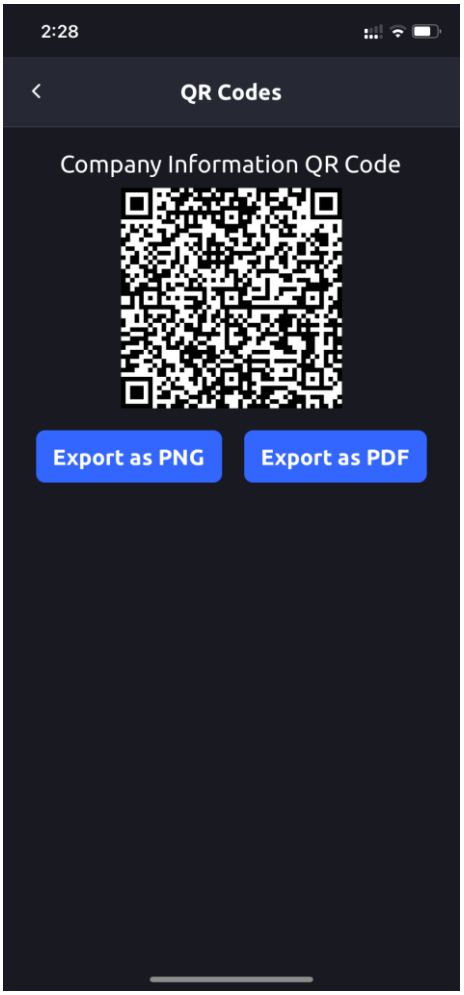


Figure 5.3.3.1 Company QR Code Export

The system generates a unique QR code for each participating company. As shown in Figure 5.3.3.1, employers can export this QR code in either PNG or PDF format for easy scanning by users.

Figure 5.3.3.2 Exported PDF file

Figure 5.3.3.2 displays an example of the exported PDF file containing the company's QR code. Employers can print this file and display it at their booth during the event for students to scan.

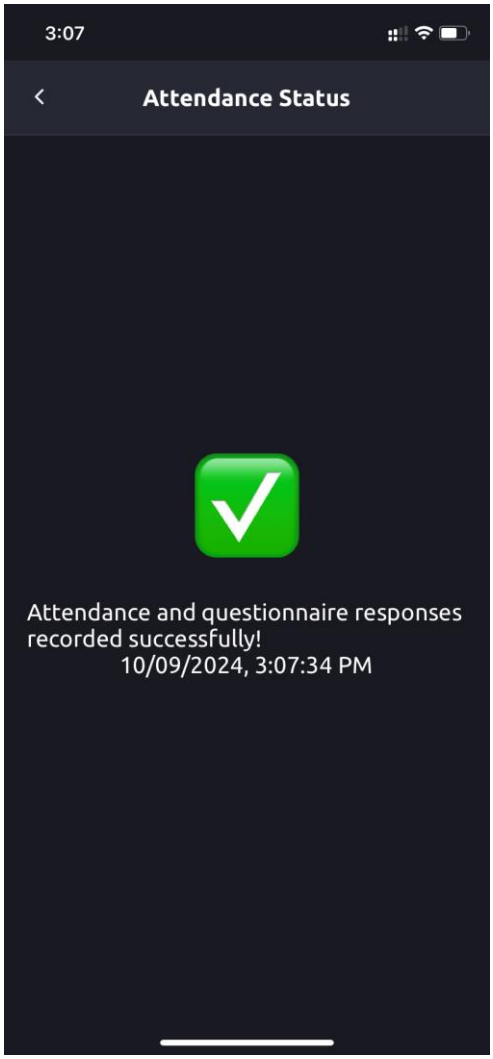


Figure 5.3.3.3 Attendance Recorded

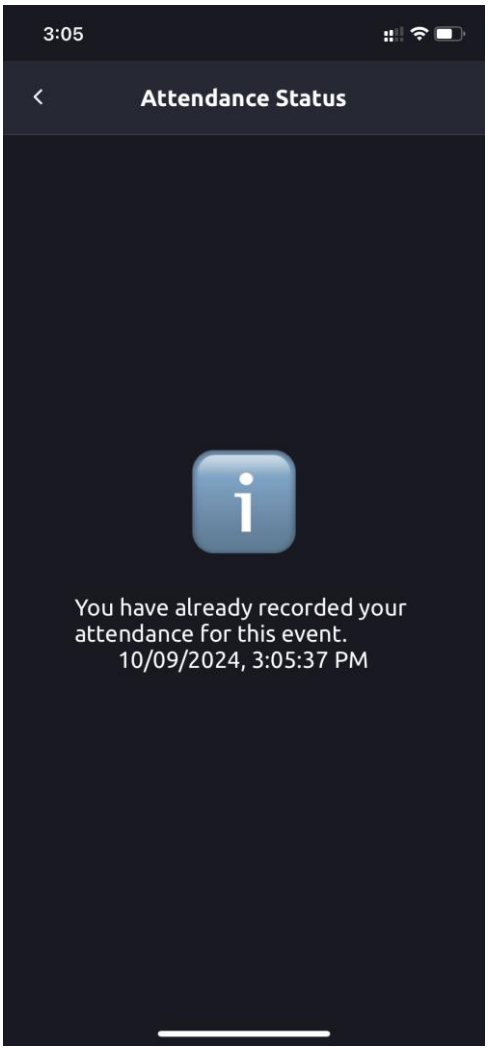


Figure 5.3.3.4 Already Recorded

Figure 5.3.3.3 demonstrates the attendance recording process when a user scans a QR code for the first time. If a user attempts to scan the same QR code again, the system will display a message indicating that attendance has already been recorded, as shown in Figure 5.3.3.4.

5.3.4 Digital Identity Card

Building upon the QR code feature, the system introduces digital identity cards. When users scan each other's QR codes, a digital card containing relevant information is generated and can be saved within the app.

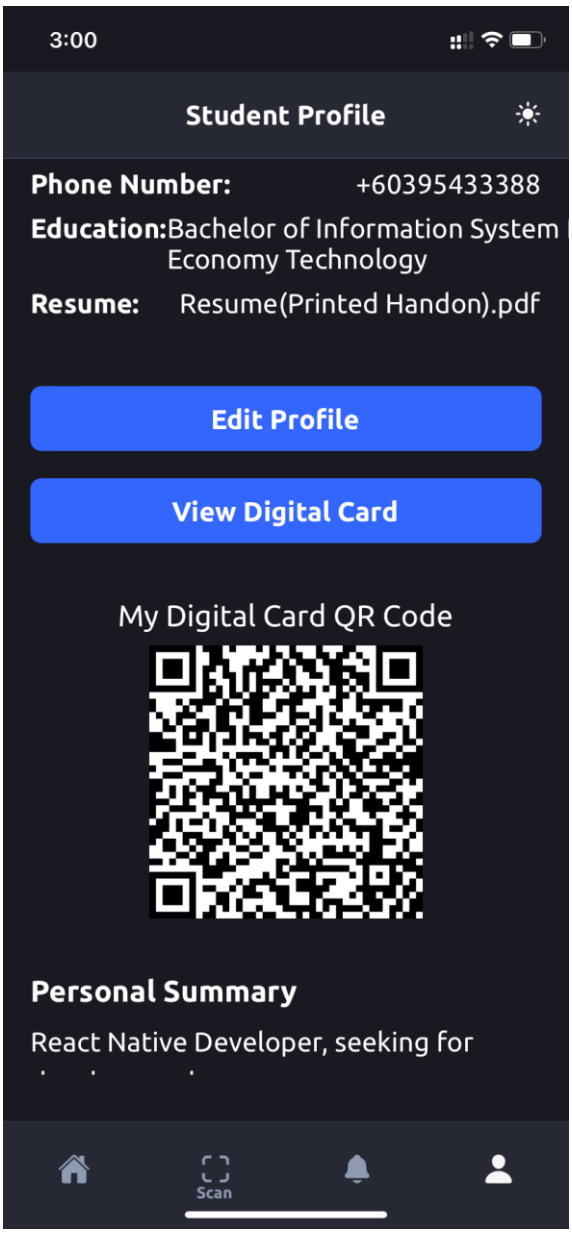


Figure 5.3.4.1 Digital Card QR Code

Figure 5.3.4.1 showcases the digital identity card feature, which includes a QR code at the bottom. Users can scan this QR code to access the digital card information. This feature facilitates easy information exchange and enhances connections during the career fair.

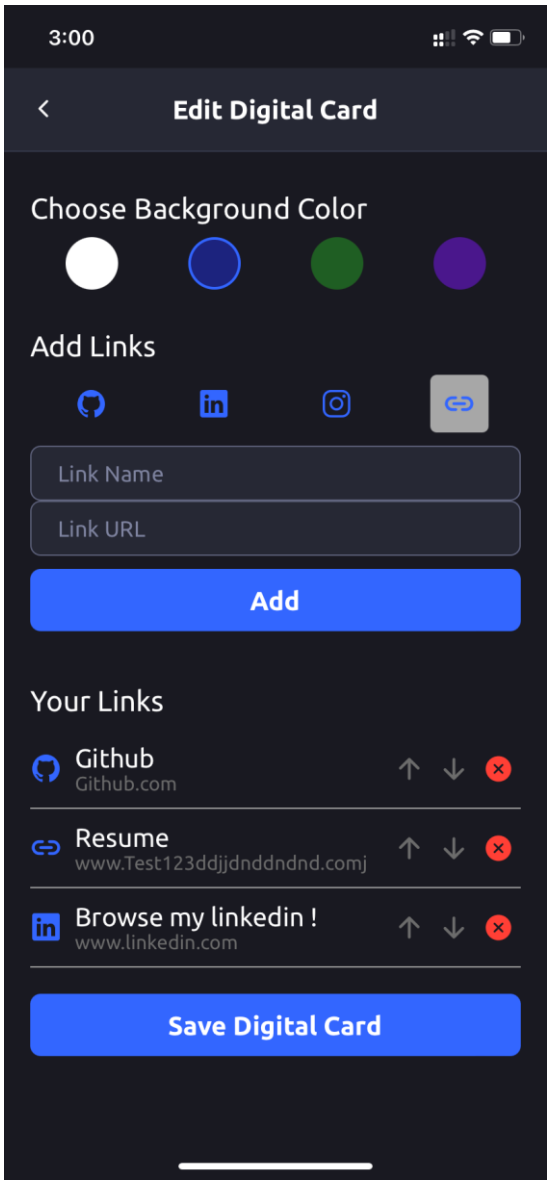


Figure 5.3.4.2 Digital Card Customization

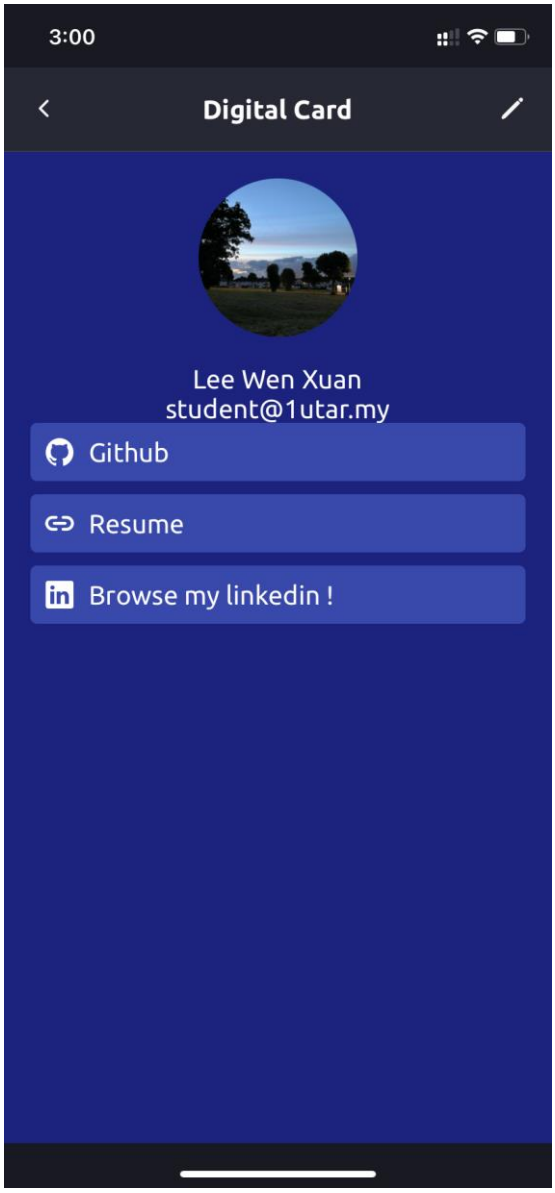


Figure 5.3.4.3 Digital Card

Figure 5.3.4.2 presents the customization options for the digital card. Users can access these options by clicking the "View Digital Card" button on the screen shown in Figure 5.3.4.1. Customization features include choosing background colors, adding links to social profiles or portfolios, and arranging the position of information displayed on the card. Users can edit and save their changes using the pen button located in the top right corner of the screen shown in Figure 5.3.4.3.

5.3.5 AI Job Listings Screener and AI Resume Builder

The AI function offering features like resume improvements, building resumes from scratch, and smart resume screening that matches students with job listings based on their skills.

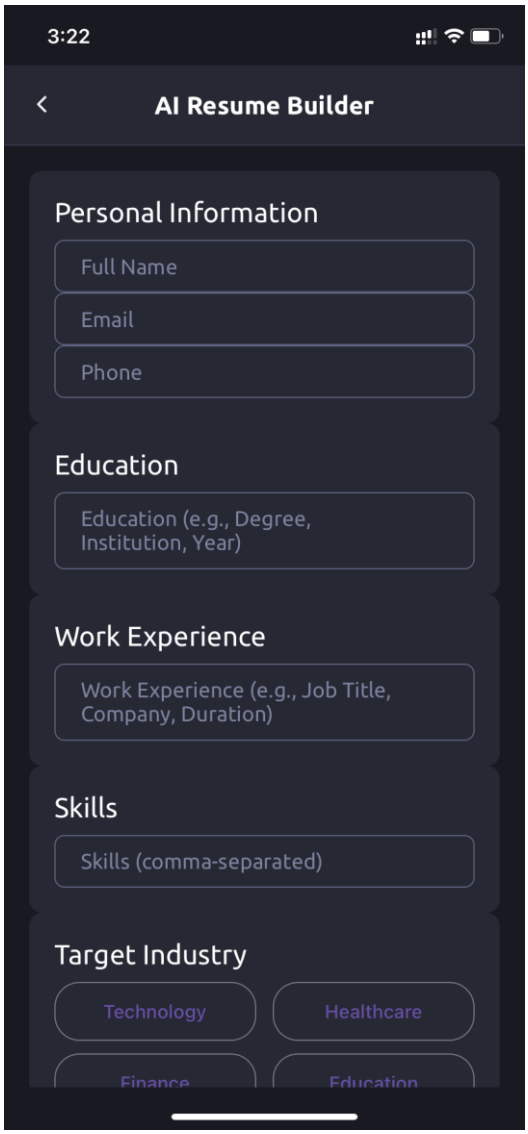


Figure 5.3.5.1 AI Resume Builder

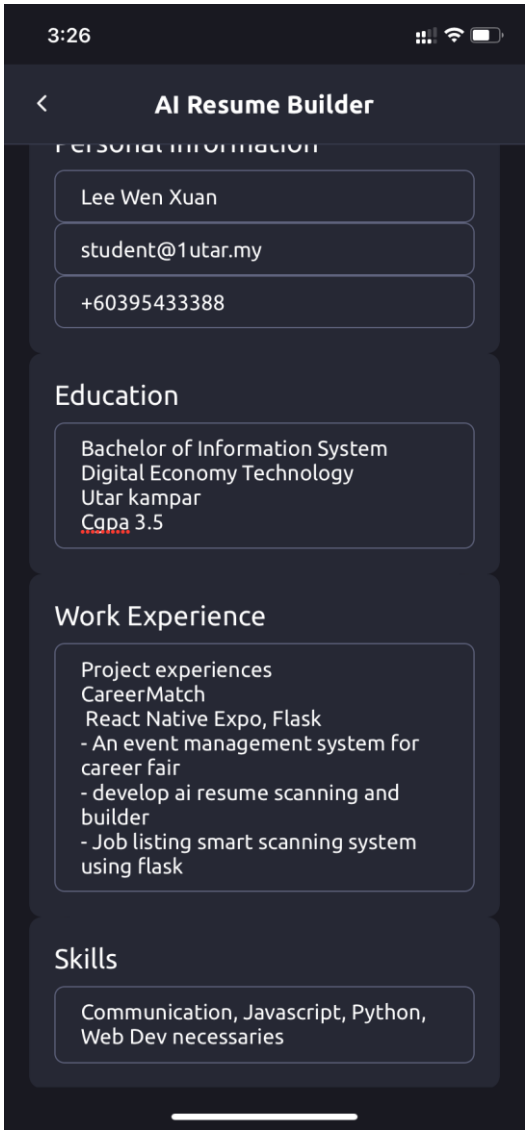


Figure 5.3.5.2 Written text for Resume

Figure 5.3.5.1 displays the AI resume builder interface. Here, users can input their personal information, education history, work or project experience, skillset, and target industry by selecting from various sectors. Figure 5.3.5.2 shows an example of the completed form, which is then analyzed by the Gemini AI.

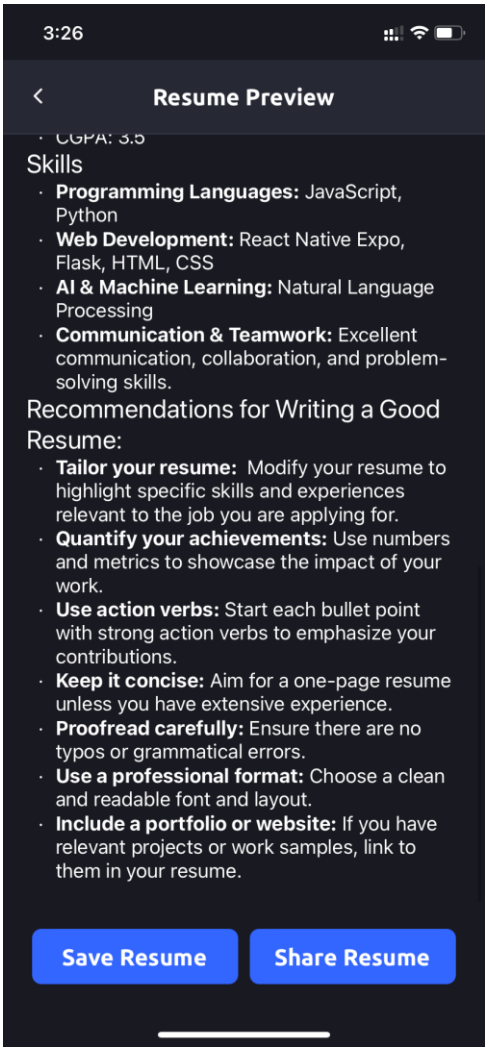


Figure 5.3.5.3 Resume Preview Screen

Figure 5.3.5.3 presents the analysis results, offering recommendations for improving the resume. Users can save the generated resume or share it directly from this screen.

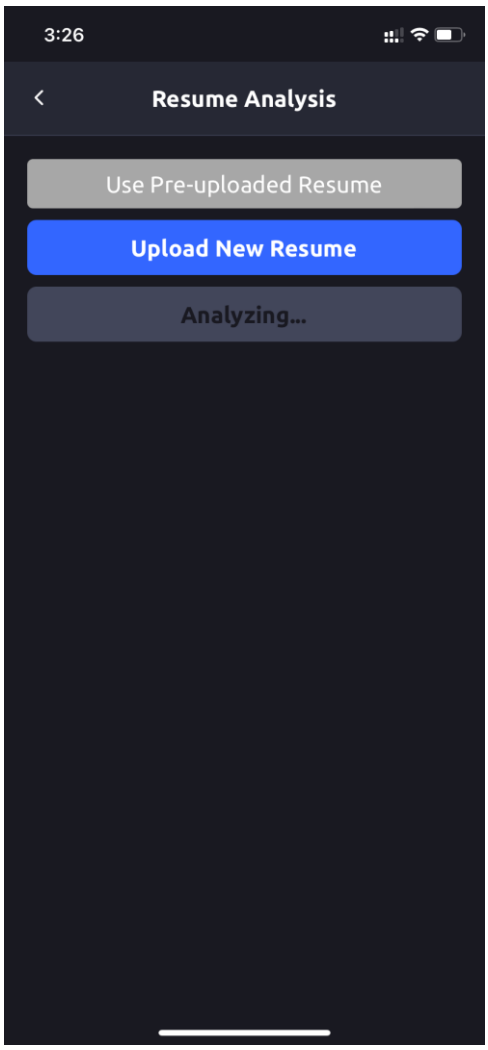


Figure 5.3.5.4 Resume Analysis

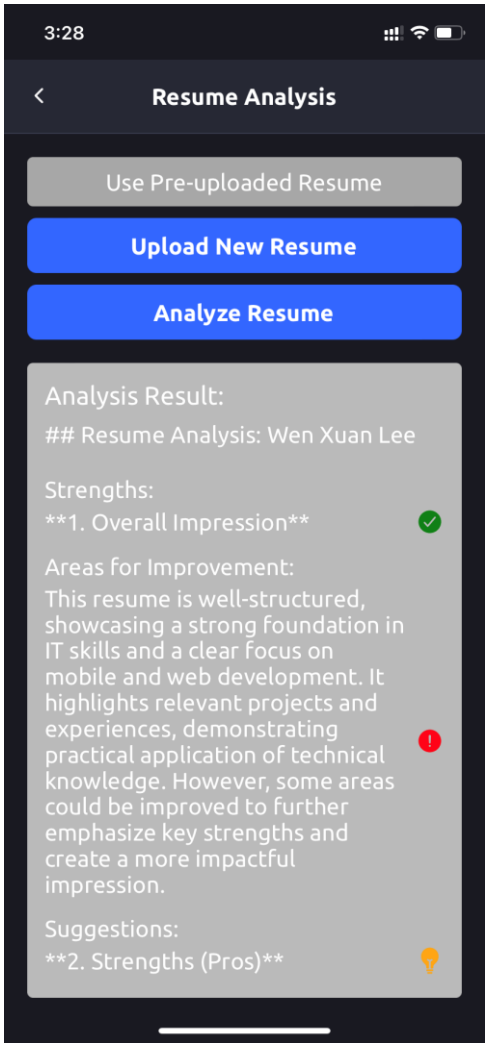


Figure 5.3.5.5 Analysed Resume

Figures 5.3.5.4 and 5.3.5.5 demonstrate another feature: resume analysis. Users can either upload a new resume or select a pre-uploaded one for the AI to analyze and provide improvement suggestions.

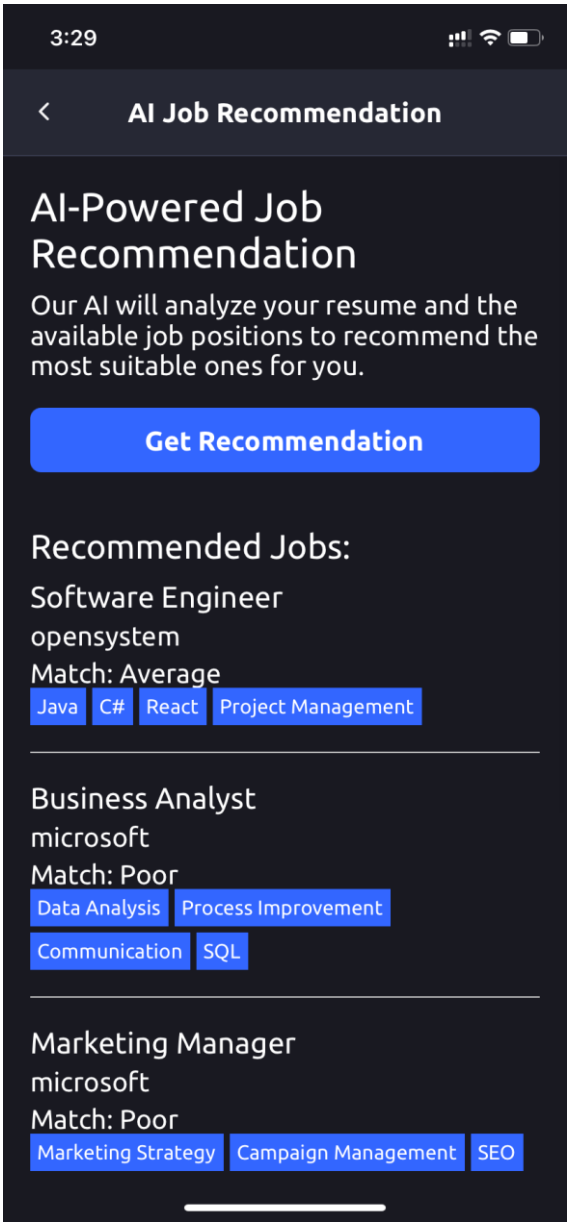


Figure 5.3.5.6 AI Job Recommendation Screen

Figure 5.3.5.6 showcases the AI job recommendation feature. When users click the "Get Recommendation" button, the AI analyzes all job postings within the selected event and ranks them as Average, Good, or Poor matches for the user. This feature saves time by helping users identify the most suitable opportunities quickly.

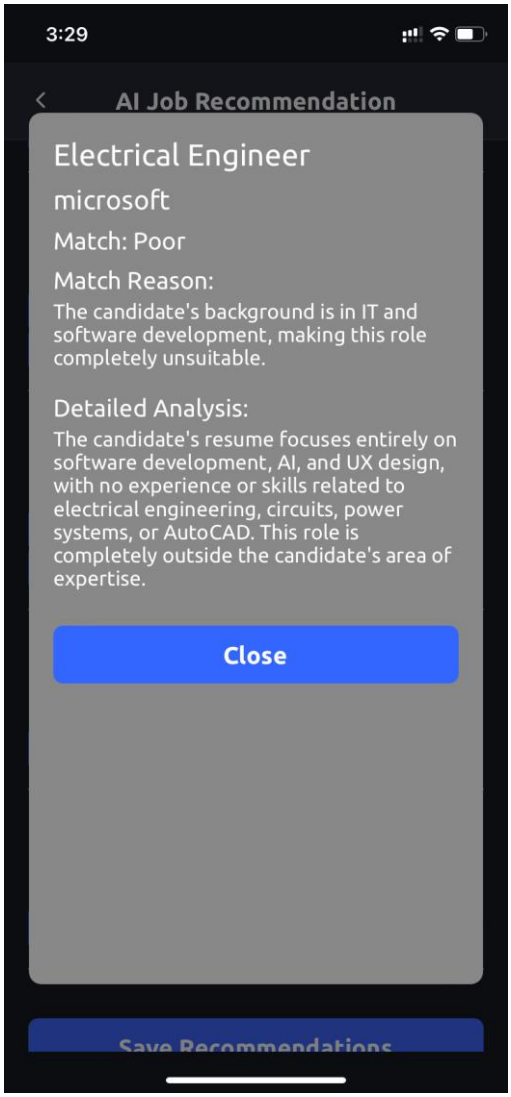


Figure 5.3.5.7 Poor Result

Figure 5.3.5.8 Average Result

Figures 5.3.5.7 and 5.3.5.8 display examples of poor match results, providing detailed analysis and reasons for the mismatch. This information helps users understand why certain positions might not be suitable and guides them in their job search process.

5.3.6 Cloud Documentation

This feature enables seamless information sharing between employers and attendees. When students scan a company's QR code, they gain access to cloud-stored documents such as digital brochures, company profiles, and job descriptions. Furthermore, students can submit their resumes directly through this system, creating an efficient application process.

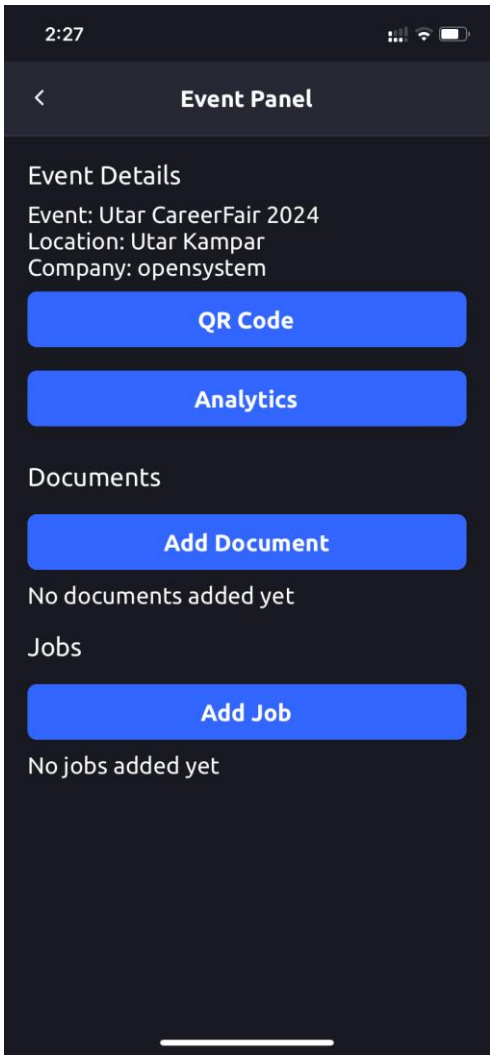


Figure 5.3.6.1 Employer Event Panel

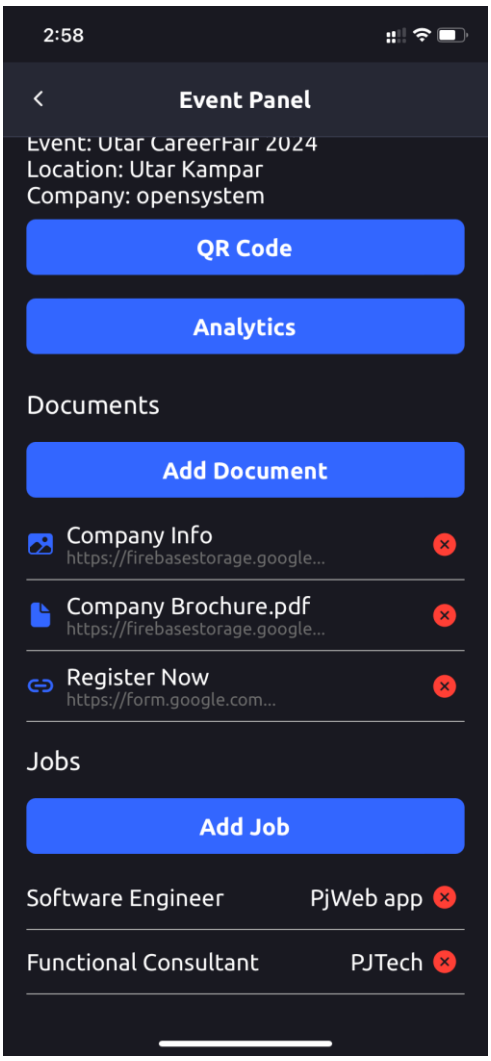


Figure 5.3.6.2 Added documents

Figure 5.3.6.1 presents the employer event panel, which serves as a central hub for managing documentations, adding job postings, exporting data to CSV, and creating QR codes. Figure 5.3.6.2 shows how the added jobs and documentations appear in the system.

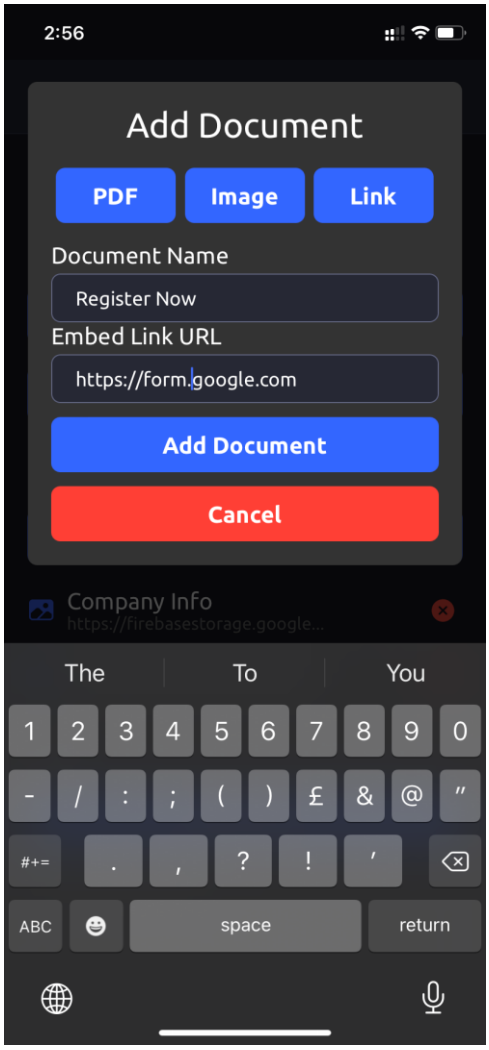


Figure 5.3.6.3 Adding Documentation

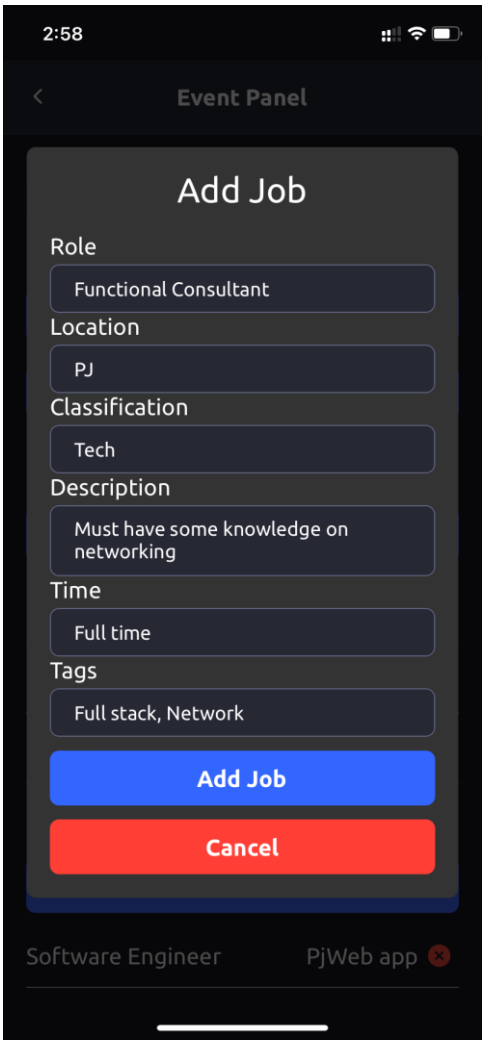


Figure 5.3.6.4 Adding Job

Figure 5.3.6.3 displays the screen for adding documents. Users can choose to add PDFs, links, or images by clicking the appropriate button. Figure 5.3.4.4 shows the interface for adding new job postings, where employers can fill in job descriptions and other relevant details.

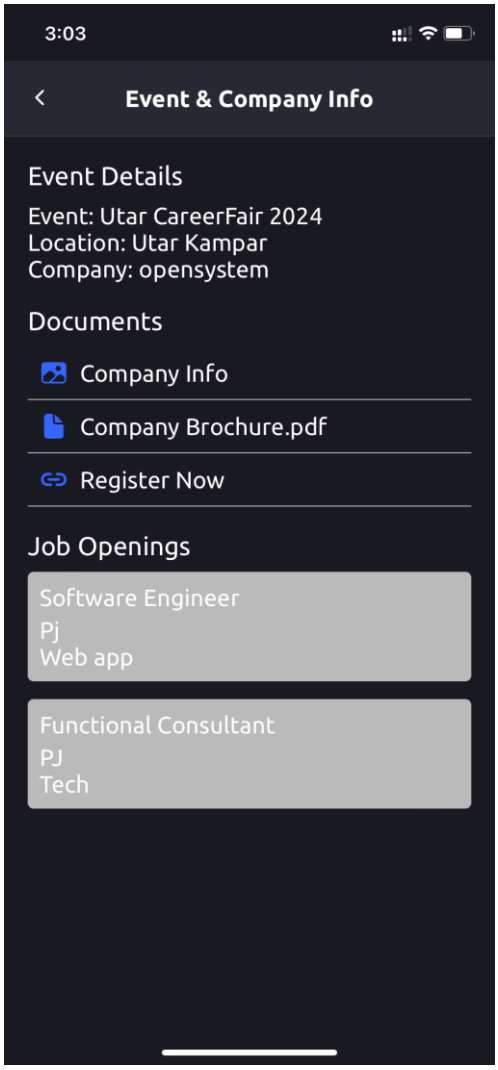


Figure 5.3.6.5 Scanned Info

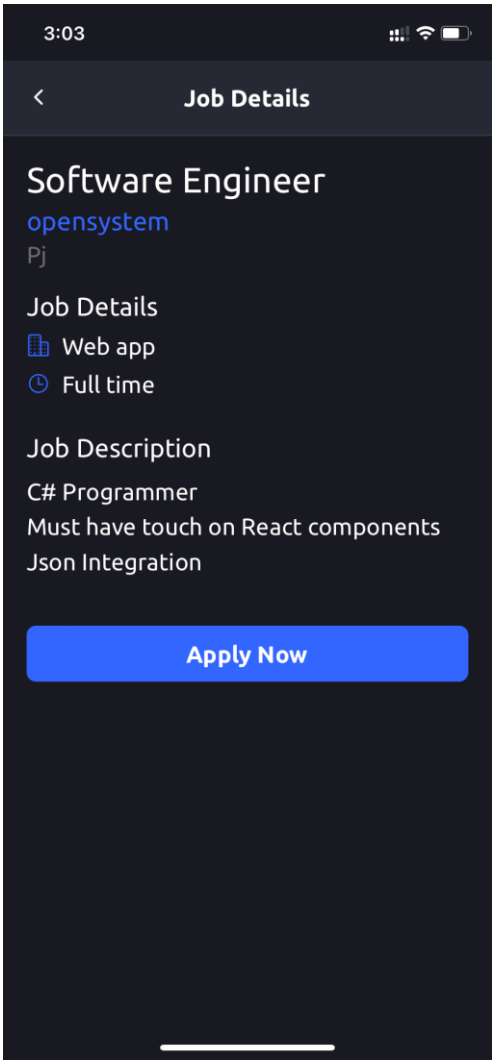


Figure 5.3.6.6 Job Details

Figure 5.3.6.5 demonstrates the screen that students see after scanning a company's QR code, showing company information and available job openings. When a student clicks on a job listing, they are directed to the detailed job description page, as shown in Figure 5.3.6.6. This page includes all relevant information and an "Apply" button.

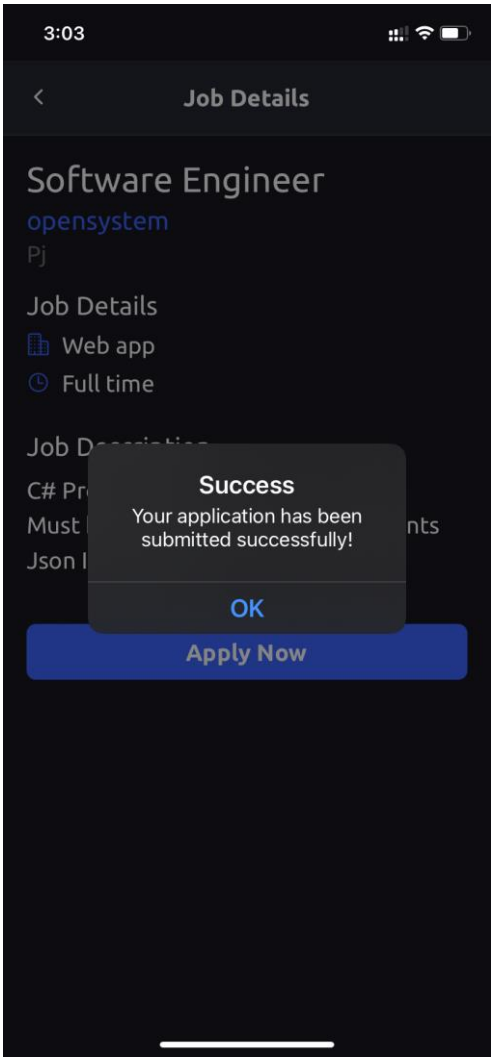


Figure 5.3.6.7 Job Applications

Figure 5.3.6.7 showcases the streamlined job application process. The system first checks if the user has uploaded a resume. If a resume is available, the user can apply with a single click, eliminating any cumbersome application processes.

5.3.7 Questionnaire System

The questionnaire system is designed to gather valuable feedback and data from event participants. When users join an event, they are prompted to answer a set of predefined questions. These questions can cover various aspects such as event organization, individual experiences, or specific interests.

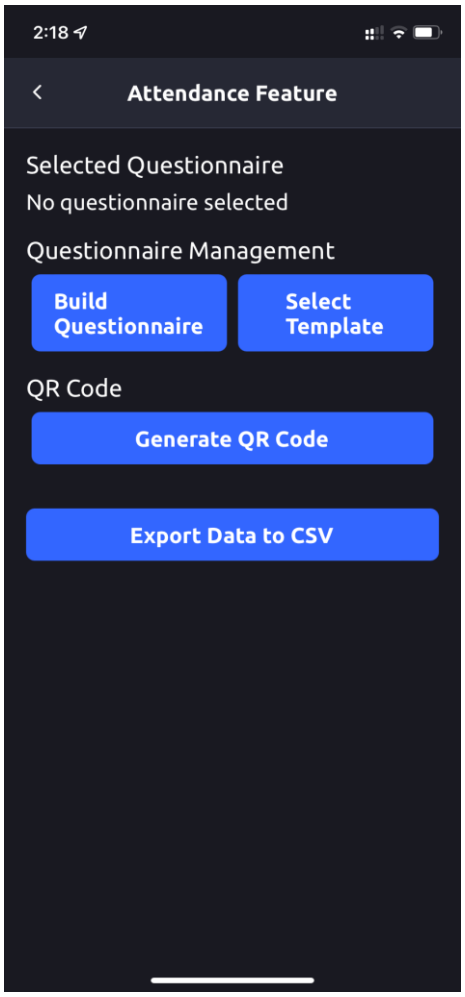


Figure 5.3.7.1 Attendance Panel

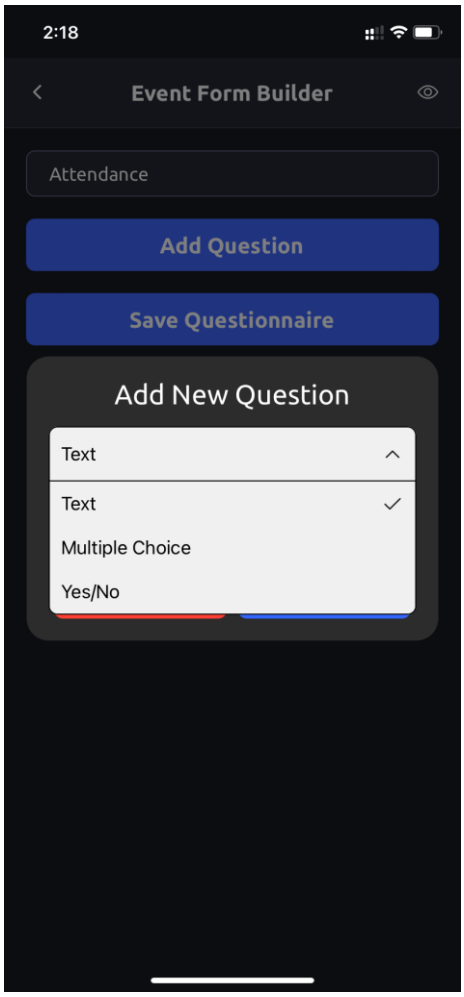


Figure 5.3.7.2 Add Questions

Figure 5.3.7.1 displays the admin's attendance panel, where administrators can add questions for students to answer after scanning the event QR code. To add questions, admins click the "Build Questionnaire" button, which leads to the screen shown in Figure 5.3.7.2. Here, they can add various types of questions: text, multiple choice, or yes/no.

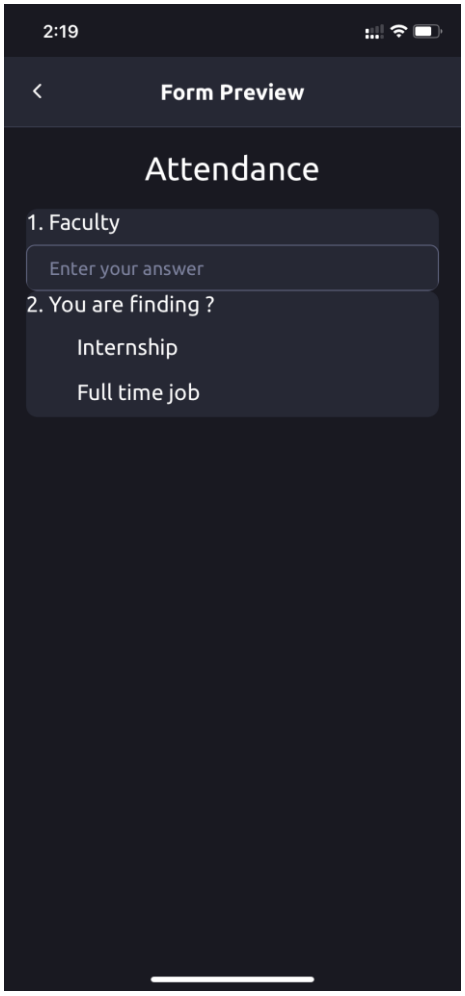


Figure 5.3.7.3 Form Preview

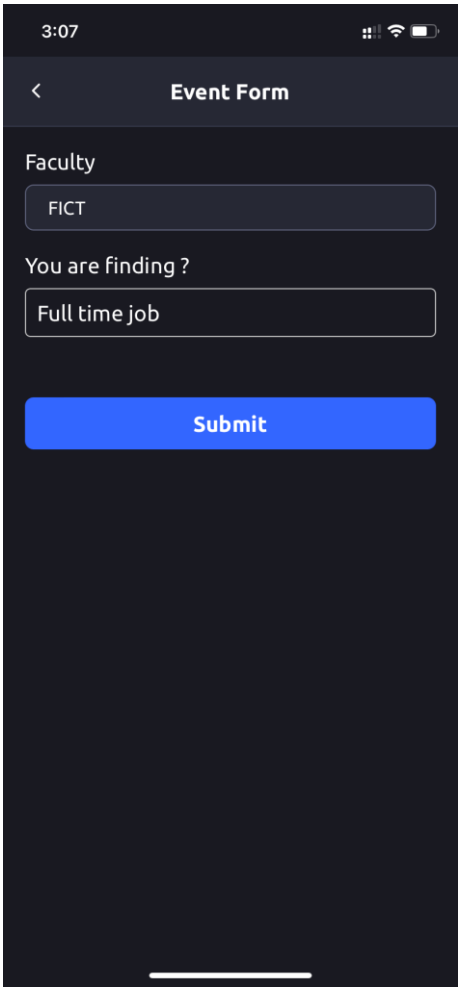


Figure 5.3.7.4 Event Form

Figure 5.3.7.3 shows a preview of the questionnaire form before saving. Figure 5.3.7.4 presents the final event form that users will see and fill out after scanning the attendance QR code.

5.3.8 CSV Export for Attendance and Submitted Resume

The system offers CSV export functionality for various data sets. Employers can easily export submitted resumes and student details with a single click, allowing for efficient processing of applicant information and event organizers can export the collected questionnaire responses in CSV format. This feature enables stakeholders to perform in-depth analysis.

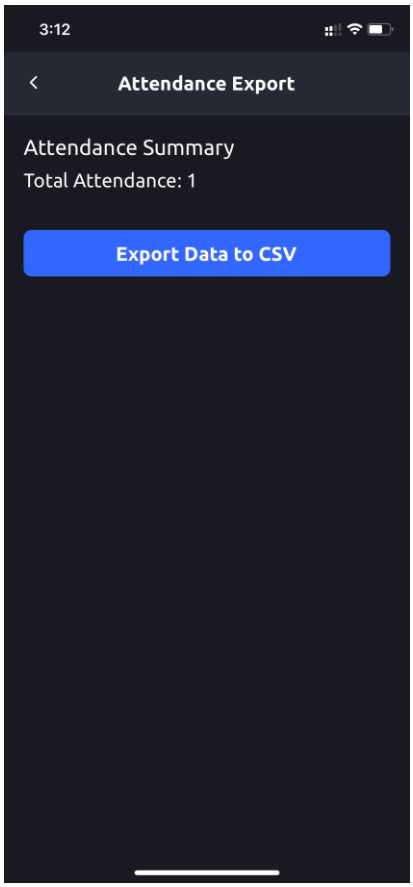


Figure 5.3.8.1 Attendance Report Export

	A	B	C	D	E	F	G
1	Time	Name	Degree	Email	PhoneNumber	Faculty	You are finding ?
2	2024-09-10T07:07:29.926Z	Cheong Mun Yo	IT	student2@1utar.my	60123456789	FICT	Full time job
3							
4							

Figure 5.3.8.2 Export Attendance CSV

Figure 5.3.8.1 displays the attendance CSV export screen. When users click "Export Data to CSV," the system generates a CSV file containing attendance data. Figure 5.3.8.2 shows an example of the exported CSV file.

Figure 5.3.8.3 Job Application Export

A	B	C	D	E	F
Time	Name	Phone	Email	Resume	Role
10/09/2024, 3:04:00 PM	Lee Wen Xuan	60395433388	student@1utar.my	https://firebasestorage.googleapis.com/v0/b/fyp2-utar.appspot.com/	Functional Consultant
10/09/2024, 3:03:51 PM	Lee Wen Xuan	60395433388	student@1utar.my	https://firebasestorage.googleapis.com/v0/b/fyp2-utar.appspot.com/	Software Engineer

Figure 5.3.8.4 Job Application CSV

Figure 5.3.8.3 presents the job application CSV export screen. Clicking "Export" generates a CSV file containing applicant information. As shown in Figure 5.3.8.4, the exported CSV includes links to the applicants' resumes stored in Firebase, allowing employers to easily download and review them.

5.4 Integration with Firebase Service

5.4.1 Firestore Database

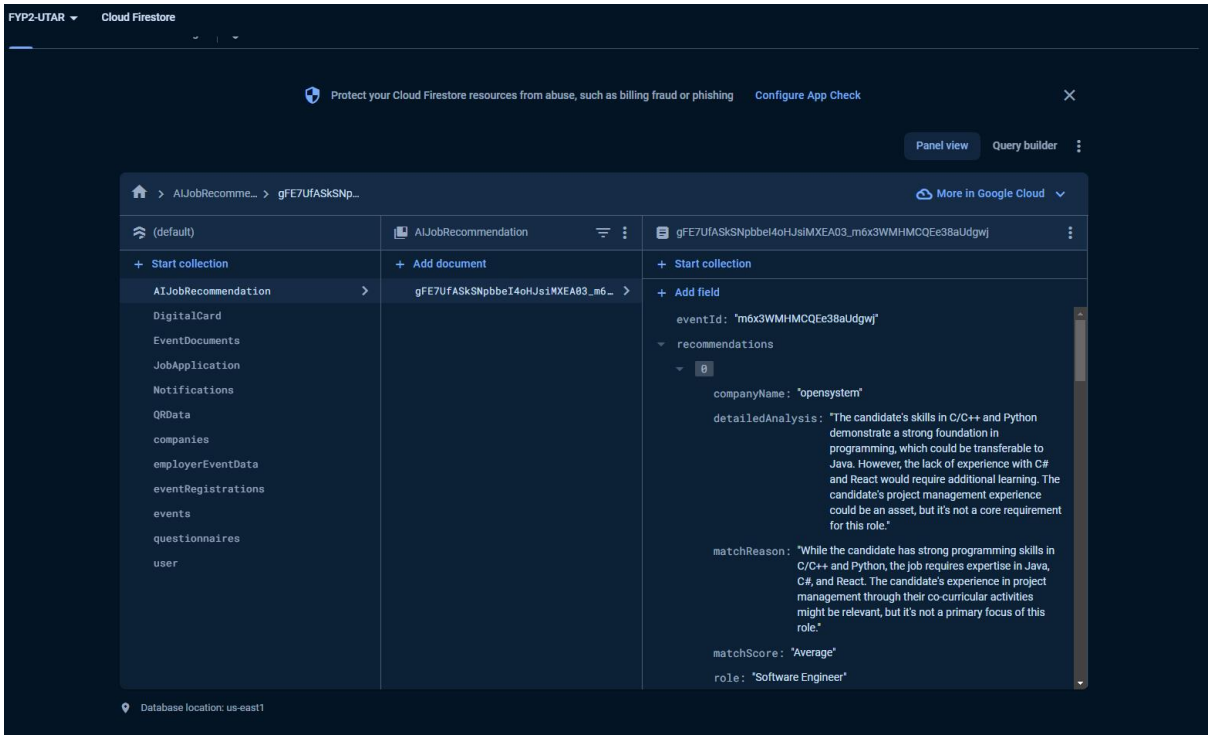


Figure 5.4.1 Firestore Database

The system leverages Firestore as shown on Figure 5.4.1, Firebase's NoSQL cloud database, for efficient data management. Firestore's document-based structure allows for flexible and scalable data organization, which is crucial for handling various types of information related to career fairs.

5.4.2 Firebase Storage

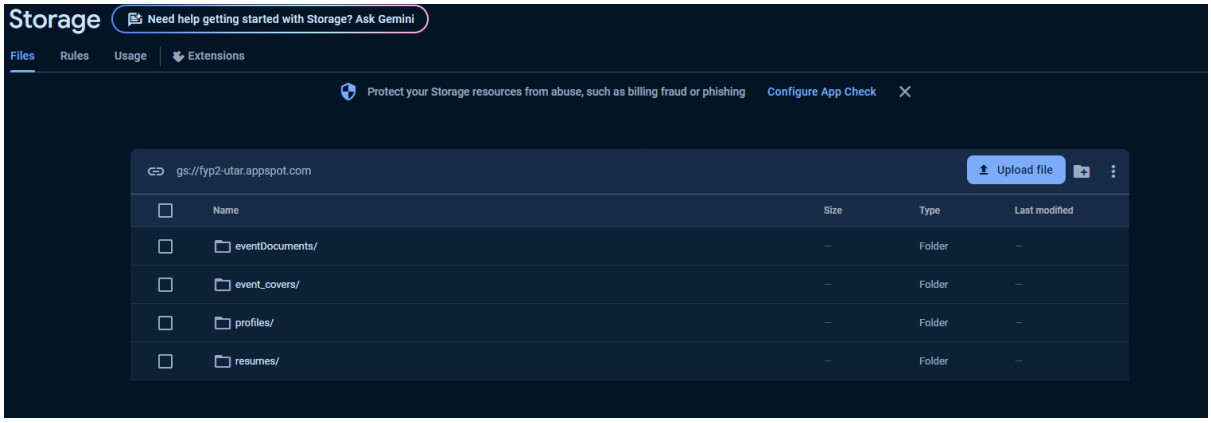


Figure 5.4.2 Firebase Storage

Figure 5.4.2 show the Firebase Storage which is utilized for storing larger files and media content that are not suitable for Firestore. This includes:

1. PDF documents: Resumes, company brochures, event guidelines
2. Images: User profile pictures, company logos, event banners
3. Other media: Video presentations, audio files for virtual booths

5.4.3 Firebase Authentication

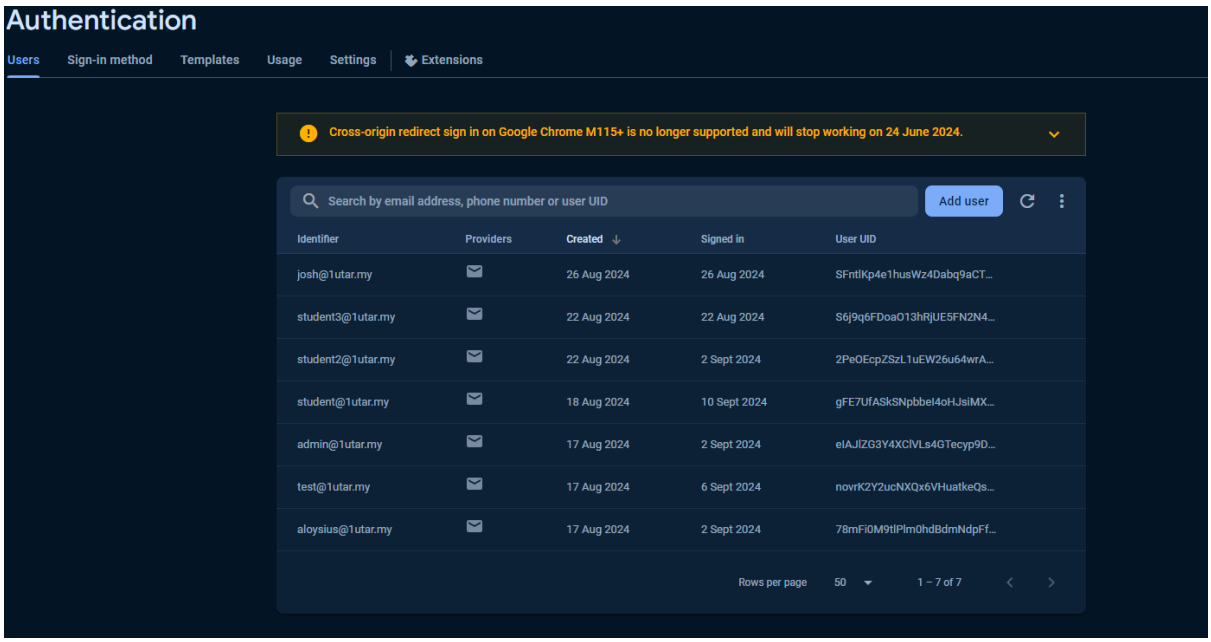


Figure 5.4.3 Firebase Authentication Page

Figure 5.4.3 shown Firebase Authentication page which provides secure user management with support for multiple authentication methods. Our system implements:

1. Email/password authentication
2. Phone number verification (for added security)
3. Role-based access control (student, employer, administrator)

5.5 Implementation Challenges and Solutions

1. Native Module Issues with PDF Analysis

Challenge

Analyzing PDF resumes uploaded to Firebase using the Gemini API directly within the React Native environment posed significant performance issues due to the limitations of mobile devices and the complexity of PDF processing, normally in the system would actually need to access to the pdf file physically to process with the text extraction for further analysis by the generative AI. This approach can be solved by implementing a RESTful API call to download to file that is uploaded to firebase storage, but that would be affecting the efficiency of the application since it needed to download file and delete it after processing.

Solution

To cope with the problem, a Flask server is implemented as an intermediary to handle PDF processing tasks using library such as PyPDF2.

Implementation details:

1. React Native app uploads the PDF to Firebase Storage.
2. App sends a request to the Flask server with the Firebase Storage URL of the PDF.
3. Flask server downloads the PDF, processes it using the Gemini API, and returns the analysis results.
4. React Native app receives and displays the results.

This server-side solution communicates with both Firebase and the Gemini API, offloading the heavy processing from the mobile app. Therefore, the result will be sent back in JSON format to the mobile app and displayed.

2. **QR Code Exposure Issues**

Challenge

Initial implementation exposed sensitive data directly in QR codes, posing a security risk. In the system, the QR Code will display a JSON text to manipulate the scanner in directing it to do specific task, therefore when using ordinary scanner to scan the QR codes, it would actually display JSON text, and therefore it needs to be encrypted for security reasons.

Solution

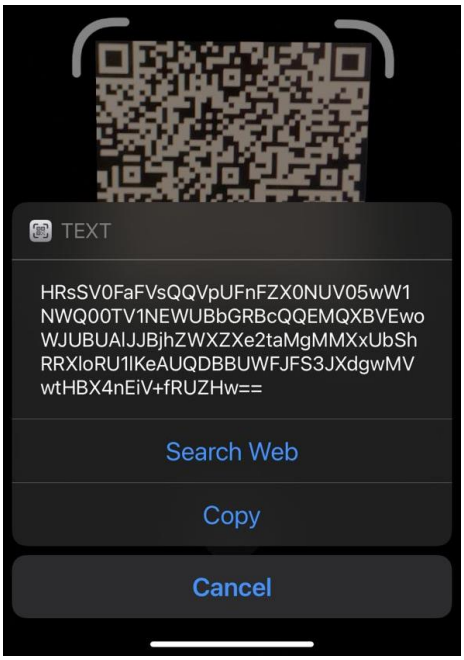


Figure 5.5.1 Encrypted QR Text

Implemented QR code encryption as shown in Figure 5.5.2 to protect the underlying data.

Implementation details:

1. Data to be encoded in QR is first encrypted using Based64 encryption.
2. Encrypted data is then used to generate the QR code.
3. When scanned, the app decrypts the data before processing.

After that, the QR code will display encrypted string after scanned with ordinary scanner instead of JSON text.

3. **System Safety and Environment Variable**

Challenge

Securing sensitive information such as API keys, database credentials, and other configuration details posed a significant security risk. Hardcoding these values in the source code or storing

them in configuration files that are committed to version control could lead to unauthorized access and potential data breaches.

Solution

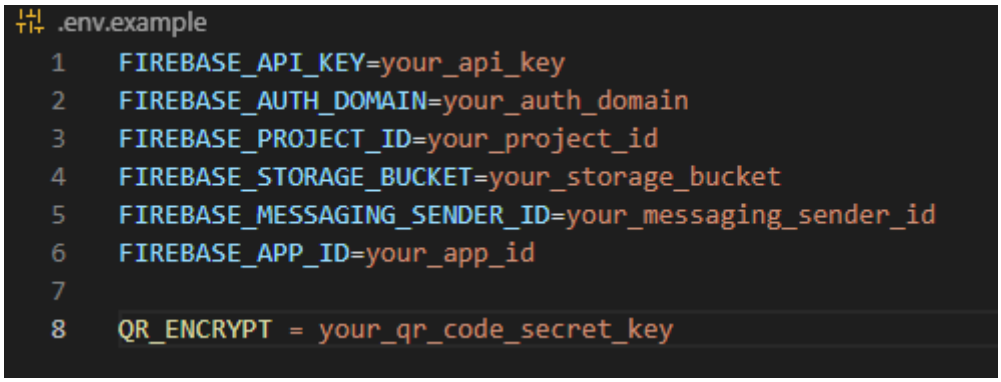


Figure 5.5.2 env file settings

The use of .env file as shown in Figure 5.5.2 was implemented to store and manage sensitive information securely. This approach allows us to keep confidential data separate from the codebase, making it easier to manage different configurations for various environments while enhancing overall system security.

For React Native, react-native-dotenv library, and for Python python-dotenv library will be used for storing the data in .env file.

Chapter 6 System Evaluation and Discussion

6.1 Black Box Testing

For the testing, Black box testing will be used to evaluate the functionality from the user's perspective, ensuring that all features are working fine.

User Authentication and Registration

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/Remark
1	User Login	LoginUser()	Function to authenticate user login	Email and password	Successful login message, redirect to appropriate dashboard (student or employer)	User logged in, redirected to correct dashboard	Pass
2	User Login with Incorrect Credentials	LoginUser()	Function to handle incorrect login attempts	Incorrect email or password	Error message displayed	Error shown: "Invalid credentials"	Pass
3	User Registration	RegisterUser()	Function to register a new user	User details (name, email, password, role: student or employer)	Successful registration message, user data stored in Firebase	User registered successfully, data visible in Firebase	Pass
4	User Registration with	RegisterUser()	Function to handle registration	User details with an	Error message about	Error shown: "Email	Pass

	Existing Email		with existing email	email already in use	existing email	already in use"	
5	Password Reset	ResetPassword()	Function to initiate password reset	User email	Password reset email sent confirmation	Reset email received by user	Pass
6	Password Reset with Non-existent Email	ResetPassword()	Function to handle password reset for non-existent email	Non-existent email	Error message about invalid email	Error shown: "Email not found"	Pass
7	Profile Completion	UpdateProfile()	Function to update user profile	Additional user details (education, phone, resume)	Profile updated successfully message	Profile information updated in database	Pass
8	Profile Completion with Invalid Data	UpdateProfile()	Function to handle invalid profile update data	Invalid phone number format	Error message about invalid input	Error shown: "Invalid phone number format"	Pass

Table 6.1.1: Blackbox Testing for User Authentication and Registration

Event Creation and Management

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/ Remark
1	Create Event	CreateEvent()	Function to create a new event	Event details (name,	Event created	Event added to database,	Pass

				date, time, location)	successfully message	visible in event list	
2	Create Event with Missing Details	CreateEvent()	Function to handle incomplete event creation	Incomplete event details (missing date)	Error message about required fields	Error shown: "Date is required"	Pass
3	Register Company for Event	RegisterCompany()	Function to register a company for an event	Company details, event ID	Company registered for event message	Company added to event's participant list	Pass
4	Register Company for Non-existent Event	RegisterCompany()	Function to handle company registration for invalid event	Company details, invalid event ID	Error message about invalid event	Error shown: "Event not found"	Pass
5	Approve Company Application	ProcessApplication()	Function to approve company applications	Company ID, approval status: approved	Application approved message	Company status updated to approved in database	Pass
6	Reject Company Application	ProcessApplication()	Function to reject company applications	Company ID, approval status: rejected	Application rejected message	Company status updated to rejected in database	Pass
7	Student Event Registration	RegisterForEvent()	Function for students to register for an event	Student ID, event ID	Registration confirmation message	Student added to event's	Pass

						attendee list	
8	Student Registration for Full Event	RegisterForEvent()	Function to handle registration for full event	Student ID, event ID (event at capacity)	Event full message	Error shown: "Event is at full capacity"	Pass

Table 6.1.2: Blackbox Testing for Event Creation and Management

QR Code Generation and Scanning

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/Remark
1	Generate QR Code	GenerateQR()	Function to generate QR code for a company	Company ID, event ID	QR code image generated	QR code created and displayed	Pass
2	Generate QR Code for Invalid Company	GenerateQR()	Function to handle QR generation for invalid company	Invalid Company ID, event ID	Error message about invalid company	Error shown: "Company not found"	Pass
3	Export QR Code as PNG	ExportQR()	Function to export QR code as PNG	QR code, export format: PNG	PNG file downloaded	QR code PNG file downloaded successfully	Pass
4	Export QR Code as PDF	ExportQR()	Function to export QR code as PDF	QR code, export format: PDF	PDF file downloaded	QR code PDF file downloaded successfully	Pass
5	Scan QR Code (First Time)	ScanQR()	Function to scan and process QR code	Scanned QR code data	Attendance recorded message	Attendance logged in database	Pass

6	Scan QR Code (Repeat)	ScanQR()	Function to handle repeated QR code scan	Scanned QR code data (already scanned)	Already scanned message	Duplicate scan prevented, message displayed	Pass
7	Scan Invalid QR Code	ScanQR()	Function to handle invalid QR code scan	Invalid QR code data	Error message about QR code	Error shown: "Invalid QR code"	Pass

Table 6.1.3: Blackbox Testing for QR Code Generation and Scanning

Digital Identity Card

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/ Remark
1	Generate Digital Card	CreateDigitalCard()	Function to create a digital identity card	User ID, user details	Digital card generated and displayed	Digital card created with correct information	Pass
2	Generate Digital Card for Invalid User	CreateDigitalCard()	Function to handle digital card creation for invalid user	Invalid User ID	Error message about invalid user	Error shown: "User not found"	Pass
3	Customize Digital Card Background	CustomizeCard()	Function to customize digital card appearance	Background color selection	Card updated with new background color	Digital card background updated as specified	Pass
4	Add Link to Digital Card	CustomizeCard()	Function to add link to digital card	New link details (title, URL)	Link added to digital card	New link visible on digital card	Pass

5	Rearrange Links on Digital Card	CustomizeCard()	Function to rearrange links on digital card	New link order	Links rearranged on digital card	Links displayed in new specified order	Pass
6	Save Digital Card Changes	SaveCardChanges()	Function to save digital card customizations	Modified card details	Changes saved successfully message	Updated card details stored in database	Pass
7	Share Digital Card	ShareCard()	Function to share digital card via QR code	User ID	QR code for digital card generated	QR code created and ready for scanning	Pass

Table 6.1.4: Blackbox Testing for Digital Identity Card

AI Resume Builder and Smart Resume Screening

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/ Remark
1	Get Job Recommend	GetJobRecommendations()	Function to match resume with job postings	User resume, event job listings	List of job recommendations (ranked as Average, Good, Poor)	Relevant job matches provided with rankings	Pass
2	Get Job Recommendation	GetJobRecommendations()	Function to handle no job matches	User resume (no matching skills), event job listings	No matches found message	Message shown: "No suitable job matches found"	Pass
3	Save Generated Resume	SaveResume()	Function to save AI-generated resume	Generated resume content	Resume saved successfully message	Resume stored in user's profile	Pass
4	Share Generated Resume	ShareResume()	Function to share generated resume	Resume ID	Share link or options displayed	Resume share link generated	Pass

Table 6.1.5: Blackbox Testing for AI Resume Builder and Smart Resume Screening

Cloud Documentation

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/Remark
1	Upload PDF Document	UploadDoc()	Function to upload	PDF file	Document uploaded	PDF stored in cloud storage	Pass

			company documents		successfully message		
2	Upload Image Document	UploadDoc()	Function to upload image documents	Image file	Document uploaded successfully message	Image stored in cloud storage	Pass
3	Add External Link	AddLink()	Function to add external link to company profile	Link URL and description	Link added successfully message	Link added to company's document list	Pass
4	Add Job Posting	AddJobPosting()	Function to add a new job posting	Job details (title, description, requirements)	Job posting added successfully message	Job listing visible in company profile	Pass
5	Edit Job Posting	EditJobPosting()	Function to edit existing job posting	Updated job details	Job posting updated successfully message	Job listing updated in database	Pass
6	Delete Job Posting	DeleteJobPosting()	Function to remove a job posting	Job ID	Job posting deleted successfully message	Job listing removed from company profile	Pass
7	View Company Info (Student)	GetCompanyInfo()	Function to retrieve company information for students	Company ID	Company details and job listings displayed	Correct company information shown to student	Pass
8	Apply for Job	ApplyForJob()	Function for students	Student ID, job ID	Application submitted message	Application recorded in database	Pass

			to apply for a job				
9	Apply for Job without Resume	ApplyForJob()	Function to handle job application without resume	Student ID (no resume), job ID	Error message about missing resume	Error shown: "Please upload a resume before applying"	Pass

Table 6.1.6: Blackbox Testing for Cloud Documentation

Questionnaire System

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/ Remark
1	Create Text Question	AddQuestion()	Function to add a text question to questionnaire	Question text, question type: text	Question added successfully message	Text question added to questionnaire	Pass
2	Create Multiple Choice Question	AddQuestion()	Function to add a multiple choice question	Question text, options, question type: multiple choice	Question added successfully message	Multiple choice question added to questionnaire	Pass
3	Create Yes/No Question	AddQuestion()	Function to add a yes/no question	Question text, question type: yes/no	Question added successfully message	Yes/No question added to questionnaire	Pass
4	Preview Questionnaire	PreviewQuestionnaire()	Function to preview	Questionnaire ID	Questionnaire preview displayed	Correct preview of	Pass

			created questionnaire			question naire shown	
5	Edit Questionnaire	EditQuestionnaire()	Function to modify existing questionnaire	Updated question details	Questionnaire updated successfully message	Changes reflected in question naire	Pass
6	Delete Question from Questionnaire	DeleteQuestion()	Function to remove a question	Question ID	Question deleted successfully message	Question removed from question naire	Pass
7	Submit Questionnaire Responses	SubmitResponses()	Function for users to submit questionnaire responses	User responses to questions	Responses submitted successfully message	Respons es recorded in database	Pass
8	Submit Incomplete Questionnaire	SubmitResponses()	Function to handle incomplete questionnaire submission	Incomplete responses (required question skipped)	Error message about required questions	Error shown: "Please answer all required questions "	Pass

Table 6.1.7: Blackbox Testing for Questionnaire System

CSV Export for Attendance and Submitted Resumes

No	Test Case	Function Name	Description	Inputs	Expected Outputs	Actual Output	Action/ Remark

1	Export Attendance Data	ExportAttendance()	Function to export attendance data to CSV	Event ID	CSV file with attendance data generated	CSV file downloaded with correct data	Pass
2	Export Attendance for Non-existent Event	ExportAttendance()	Function to handle export for invalid event	Invalid Event ID	Error message about invalid event	Error shown: "Event not found"	Pass
3	Export Job Applications	ExportApplications()	Function to export job application data to CSV	Event ID, Company ID	CSV file with applicant data and resume links generated	CSV file downloaded with correct applicant information	Pass
4	Export Applications for Company with No Applicants	ExportApplications()	Function to handle export for company with no applicants	Event ID, Company ID (no applicants)	CSV file with headers but no data	Empty CSV file (only headers) downloaded	Pass
5	Export Questionnaire Responses	ExportQuestionnaire()	Function to export questionnaire responses	Event ID	CSV file with questionnaire responses generated	CSV file downloaded with response data	Pass
6	Download Resume from CSV Link	DownloadResume()	Function to download resume from link in CSV	Resume download link	Resume PDF downloaded	Resume file successfully downloaded	Pass

7	Download Resume with Expired Link	DownloadResume()	Function to handle expired resume download link	Expired resume download link	Error message about expired link	Error shown: "Download link has expired"	Pass

Table 6.1.8: Blackbox Testing for CSV Export for Attendance and Submitted Resumes

6.2 Project Challenge

The development of the Event Management System for Career Fair presented several significant challenges. These obstacles required solutions and careful planning to overcome. Hence there are three major challenges during the development.

1. Implementing Role-Based User Interfaces

One of the primary challenges was creating distinct, role-specific landing screens for employers, organizers, and students. Each user type required a unique screen to suit to their specific needs and functions within the system without having the issues in clashing

For example, the employer screen needed to focus on managing their company profile, posting job listings, and reviewing submitted resumes. In contrast, the student screen had to prioritize features like browsing available companies, submitting resumes, and scheduling interviews. The organizer's required tools for event creation, management, and overall system administration.

2. PDF Processing Limitations with Node.js

Another significant problem that encountered during development was the limitation of Node.js in processing online PDF files. Specifically facing issues when trying to read and extract information from PDF resumes hosted on external URLs. For instance, when a student uploaded their resume as a link to a PDF hosted on a cloud storage service, our Node.js backend struggled to access and parse this document directly. This limitation posed a problem for AI-powered resume screening feature, which relied on extracting text content from the resumes. To address this, alternative solutions such as implementing a separate microservice using

Python had to be implemented. This required additional integration work and careful handling of data transfer between different parts of our system.

3. Secure QR Code Data Interpretation

Another challenge that faced was developing a secure and efficient method for interpreting data from QR codes scanned within our app, without exposing the underlying JSON structure to potential security risks. For example, when a student uses the app to scan a company's QR code at a career fair booth, it needed to ensure that the app could accurately interpret the encoded data and trigger the appropriate action, such as viewing the company's digital brochure or initiating the resume submission process.

6.3 Project Outcomes

Objective	Implemented Features
1. To design a function to analyze job postings and resumes from the career fair and match them with user preferences using natural language processing (NLP).	- AI Resume Builder and Screening - AI Job Listings Screener
2. To investigate the current networking challenges faced by attendees and employers focusing on information exchange limitations.	- Digital Card - Cloud Documentations - Information to CSV export
3. To determine the current utilization and integration of QR code technology within career fair environments, examining its effectiveness in enhancing attendee engagement.	- QR Code Generation and Scanning - Attendance Scanning with build in Questionnaire System

Table 6.3 Project Outcome

According to Table 6.3, for objective 1, the project successfully implemented advanced natural language processing (NLP) capabilities using the GeminiAPI Generative AI to analyze job postings and resumes and match them with user preferences. The AI Job Listings Screener complements this by analyzing job postings to extract key requirements, responsibilities, and qualifications. It then uses this information to match job listings with candidate profiles, ensuring that students are presented with opportunities that align closely with their skills and career goals. On the other hand, the AI Resume Builder and Screening feature utilizes the power of Generative AI to assist students in creating compelling resumes tailored to their target industries. It analyzes the content and structure of resumes, providing suggestions for improvements and highlighting key skills that align with industry standards. The integration of GeminiAPI Generative AI has enhanced the accuracy and efficiency of the matching process, significantly improving the relevance of connections made between students and employers at career fairs.

To address objective 2, the project successfully addressed networking challenges and information exchange limitations through the implementation of digital solutions. The Digital

Card feature has improved the way attendees and employers exchange contact information. By replacing traditional business cards with digital profiles, the system has made information exchange more comprehensive. Users can easily update their information, and recipients can quickly save and organize contacts, eliminating the risk of lost or damaged physical cards. Another solution where Cloud Documentations have significantly improved the accessibility of important information. Resumes, company brochures, and job descriptions are now stored securely in the cloud, allowing for easy access and updates. This feature has reduced the need for physical documents, making the career fair more environmentally friendly and ensuring that all parties have access to the most up-to-date information. Lastly, the Information to CSV export functionality has enhanced data management and analysis capabilities. Organizers and employers can export relevant data in CSV format, facilitating further analysis and integration with other systems.

For objective 3, the project has successfully integrated QR code technology into the career fair environment, significantly enhancing attendee engagement and streamlining various processes. The QR Code Generation and Scanning feature has been widely adopted, allowing for quick and easy access to digital profiles, job listings, and company information. Attendees can simply scan QR codes to view detailed information or save contacts, reducing the time spent on manual data entry and allowing for more meaningful interactions. The Attendance Scanning with built-in Questionnaire System has proven particularly effective in enhancing engagement and gathering valuable data.

In conclusion, the implemented features have successfully addressed all three objectives, resulting in a more efficient, engaging, and data-driven career fair experience for all participants.

Chapter 7 Conclusions and Recommendations

7.1 Conclusion

The Event Management System for Career Fair project was conceived to address a significant gap in the event management market, specifically targeting the unique needs of career-oriented events. The project began with a comprehensive background analysis and literature review to understand the deficiencies in existing systems and the specific requirements of career fairs.

Throughout its development, the project faced several challenges, including the creation of role-based user interfaces, overcoming PDF processing limitations, and ensuring secure QR code data interpretation. Despite these obstacles, innovative solutions were implemented, demonstrating the team's problem-solving capabilities and commitment to the project's goals.

On the other hand, the project successfully achieved its objectives by implementing advanced features such as AI-powered resume and job listing analysis using GeminiAPI Generative AI, digital networking solutions, and efficient QR code technology integration. These features directly addressed the initial aims of improving job matching, enhancing networking capabilities, and streamlining event processes. In addition, Key outcomes include the development of an AI Resume Builder and Screener, implementation of Digital Cards for efficient information exchange, Cloud Documentation for easy access to important files, and an Attendance Scanning system with a built-in questionnaire. These features collectively contribute to a more efficient, engaging, and data-driven career fair experience. In conclusion, the Event Management System for Career Fair successfully addresses the identified problem statements by providing efficient solutions for event and company selection, enhancing digital networking capabilities, and effectively integrating QR code technology. The implemented features align closely with the project objectives, offering innovative solutions that significantly improve the career fair experience for all stakeholders. This project demonstrates how targeted technological interventions can transform traditional event management practices in the career development sector.

7.2 Recommendation

1. Expansion of Post-Event Features and Long-Term Career Development Tracking

The system could be expanded to include more post-event features and long-term career development tracking capabilities. This enhancement would transform the app from a tool primarily focused on facilitating career fairs into a comprehensive career development platform.

For instance, the app could implement a follow-up system that reminds students to send thank-you notes to employers they interacted with during the fair. It could also provide a structured timeline for students to track their application status, interview schedules, and offer deadlines for positions they applied to during the event.

By expanding in this direction, the app would provide ongoing value to both students and employers beyond the immediate context of career fairs, potentially increasing user retention and engagement.

2. Adapting the System for Other Types of Events

While the current system is designed for career fairs, there is significant potential in adapting it for other types of events. This expansion could open up new markets and use cases, increasing the overall value and applicability of the platform. For example, the system could be modified to support academic conferences. In this context, the app could facilitate attendee registration, manage presentation schedules, and enable networking among researchers. The QR code feature could be used for quick exchange of contact information or for accessing digital copies of research posters and papers.

To achieve this adaptability, developing a modular architecture that allows for easy customization of core features would be beneficial. This might involve creating a base event management system with pluggable modules for specific event types. Such an approach would not only expand the potential user base but also make the system more resilient to changes in the event management landscape.

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APPENDIX

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Trimester 2, Year 3	**Study week no.:2**
Student Name & ID: LEE WEN XUAN & 20ACB05688	
Supervisor: ENCIK AMMAR BIN AZLAN	
Project Title: EVENT MANAGEMENT SYSTEM FOR CAREER FAIR	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

1. All specification had updated to the latest version
2. Node.js updated to the 18.0 version
3. File Structure reallocated.
4. Researched best practices for role-based access control in React Native applications.

2. WORK TO BE DONE

1. Assign File allocation to three different roles, Employer, Admin (Organizer) and Student.
2. Specifying the Tabs that the user will alocate based on their role
3. Add Profile screen for user.

3. PROBLEMS ENCOUNTERED

1. Find way to allocate the user to the screen that the specific role that should display.

4. SELF EVALUATION OF THE PROGRESS

1. Made good progress on updating the technical environment but need to focus more on actual development tasks.
2. Spent time on project planning and requirement analysis, which should pay off in the long run.
3. Need to improve time management to balance between setup tasks and actual development work.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Trimester 2, Year 3	**Study week no.:4**
Student Name & ID: LEE WEN XUAN & 20ACB05688	
Supervisor: ENCIK AMMAR BIN AZLAN	
Project Title: EVENT MANAGEMENT SYSTEM FOR CAREER FAIR	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

1. Implemented basic user authentication functionality using Firebase.
2. Created initial screen layouts for the main application tabs.
3. Developed a basic user profile screen with editable fields.
4. Researched methods for secure storage of sensitive information like API keys.

2. WORK TO BE DONE

1. Add .env file to firebase authentication key for safety purposes
2. Add upload pdf feature such as uploading Resume
3. Event Creation module
4. Event Registration module
5. Event Company Info Creation.

3. PROBLEMS ENCOUNTERED

Figuring out a way to upload the pdf and files to the firebase.

4. SELF EVALUATION OF THE PROGRESS

1. Made steady progress on core functionality, but slightly behind on some planned features.
2. Successfully tackled the challenge of role-based screen allocation.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Trimester 2, Year 3	**Study week no.:6**
Student Name & ID: LEE WEN XUAN & 20ACB05688	
Supervisor: ENCIK AMMAR BIN AZLAN	
Project Title: EVENT MANAGEMENT SYSTEM FOR CAREER FAIR	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

1. Implemented file upload functionality for PDF documents (e.g., resumes).
2. Developed the event creation module for admin users.
3. Created the event registration system for students and employers.
4. Designed and implemented the company information creation feature for employers.
5. Began research on QR code generation and scanning libraries compatible with React Native.

2. WORK TO BE DONE

1. QR Scanner Development.
2. QR Code Algorithm generation.
3. Creating Digital Card Feature.

3. PROBLEMS ENCOUNTERED

1. Find a way to encrypt the qr code so that only my scanner work.
2. Digital Card function to add links

4. SELF EVALUATION OF THE PROGRESS

1. Made significant progress on core features, particularly event-related functionality.
2. Successfully overcame the challenge of file uploads to Firebase.
3. Slightly behind schedule on QR code features, need to catch up in the coming weeks.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Trimester 2, Year 3	**Study week no.:8**
Student Name & ID: LEE WEN XUAN & 20ACB05688	
Supervisor: ENCIK AMMAR BIN AZLAN	
Project Title: EVENT MANAGEMENT SYSTEM FOR CAREER FAIR	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

1. Developed QR code scanning functionality using a React Native compatible library.
2. Implemented QR code generation algorithm with basic encryption.
3. Created the initial version of the Digital Card feature.
4. Enhanced the user interface design for better user experience.
5. Implemented basic notification system for all user types.

2. WORK TO BE DONE

1. Enhancing Objective 2(Digital Card Feature) for design
2. Notification feature for all user.
3. Creating function for QR that able to be generate by Employer to show it on the booth.

3. PROBLEMS ENCOUNTERED

1. React Native Expo Localhost error.

4. SELF EVALUATION OF THE PROGRESS

1. Made good progress on QR code-related features, catching up on previous delay.
2. Successfully implemented encryption for QR codes, enhancing security.
3. Need to allocate more time for thorough testing of new features.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Trimester 2, Year 3	**Study week no.:10**
Student Name & ID: LEE WEN XUAN & 20ACB05688	
Supervisor: ENCIK AMMAR BIN AZLAN	
Project Title: EVENT MANAGEMENT SYSTEM FOR CAREER FAIR	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

1. Implemented job and event browsing functionality for students.
2. Developed a basic questionnaire creation tool for event organizers.
3. Created a CSV export feature for event questionnaires and submitted resumes.
4. Researched potential solutions for PDF text extraction.
5. Fixed the React Native Expo localhost error encountered in the previous week.

2. WORK TO BE DONE

1. Finding a way for extract PDF Information to extract the text for LLM to analyse.
2. Adding a form maker for event questionnaire
3. Adding Feature on exporting all information CSV format for further analysis.

3. PROBLEMS ENCOUNTERED

1. PDF cannot be extracted throught nodejs server.

4. SELF EVALUATION OF THE PROGRESS

1. Made good progress on student-facing features and data export functionality.
2. Successfully resolved the localhost error, improving development efficiency.
3. Need to find a solution for PDF text extraction quickly to stay on schedule.
4. Should start planning for user acceptance testing.

Supervisor's signature

Student's signature

FINAL YEAR PROJECT WEEKLY REPORT

(Project II)

Trimester, Year: Trimester 2, Year 3	**Study week no.:12**
Student Name & ID: LEE WEN XUAN & 20ACB05688	
Supervisor: ENCIK AMMAR BIN AZLAN	
Project Title: EVENT MANAGEMENT SYSTEM FOR CAREER FAIR	

1. WORK DONE

[Please write the details of the work done in the last fortnight.]

1. Successfully implemented AI-powered Resume Builder feature.
2. Developed Resume Analysis functionality using AI.
3. Set up a Flask server to handle AI-related features.
4. Conducted initial testing of AI features and made necessary adjustments.
5. Began UI enhancements across all screens for a more polished look.

2. WORK TO BE DONE

UI Enhancing for all the screen and finish the documentation

3. PROBLEMS ENCOUNTERED

No problem encountered

4. SELF EVALUATION OF THE PROGRESS

1. Need to focus on comprehensive testing of all features, especially the newly added AI capabilities.
2. Should prioritize documentation writing to ensure all development decisions and processes are well-recorded.

Supervisor's signature

Student's signature

POSTER

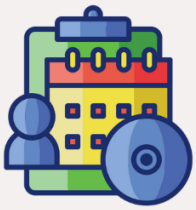
PROJECT SUPERVISOR : ENCIK AMMAR BIN AZLAN
PROJECT DEVELOPER : LEE WEN XUAN

FACULTY OF INFORMATION COMMUNICATION AND TECHNOLOGY

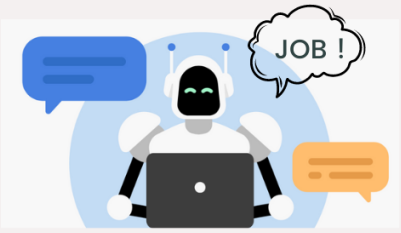
EVENT MANAGEMENT SYSTEM FOR CAREER FAIR

DESCRIPTION

Experience an efficient and innovative career fair with Event Management System! Streamline networking and recruitment using chatbots, QR codes, and customizable profiles. Enjoy personalized job recommendations, instant assistance, and seamless information exchange.



AI POWERED JOB MATCHING AND AI RESUME BUILDER

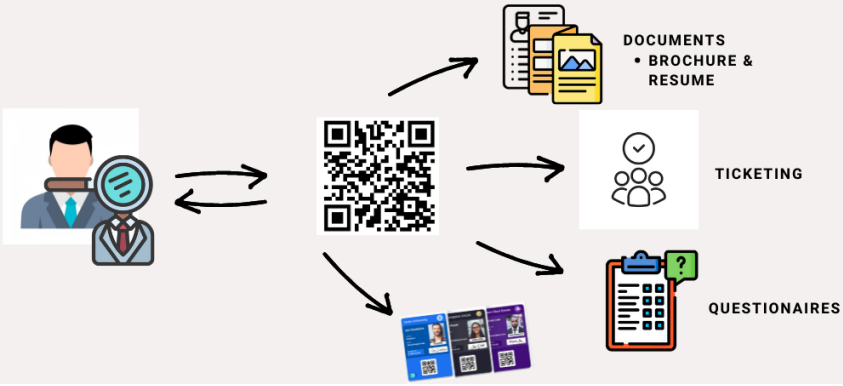


Provides attendees with personalized job recommendations and AI Resume Builder to assists companies in finding suitable candidates efficiently using Generative AI.

DIGITAL CARD EXCHANGE FUNCTIONALITY

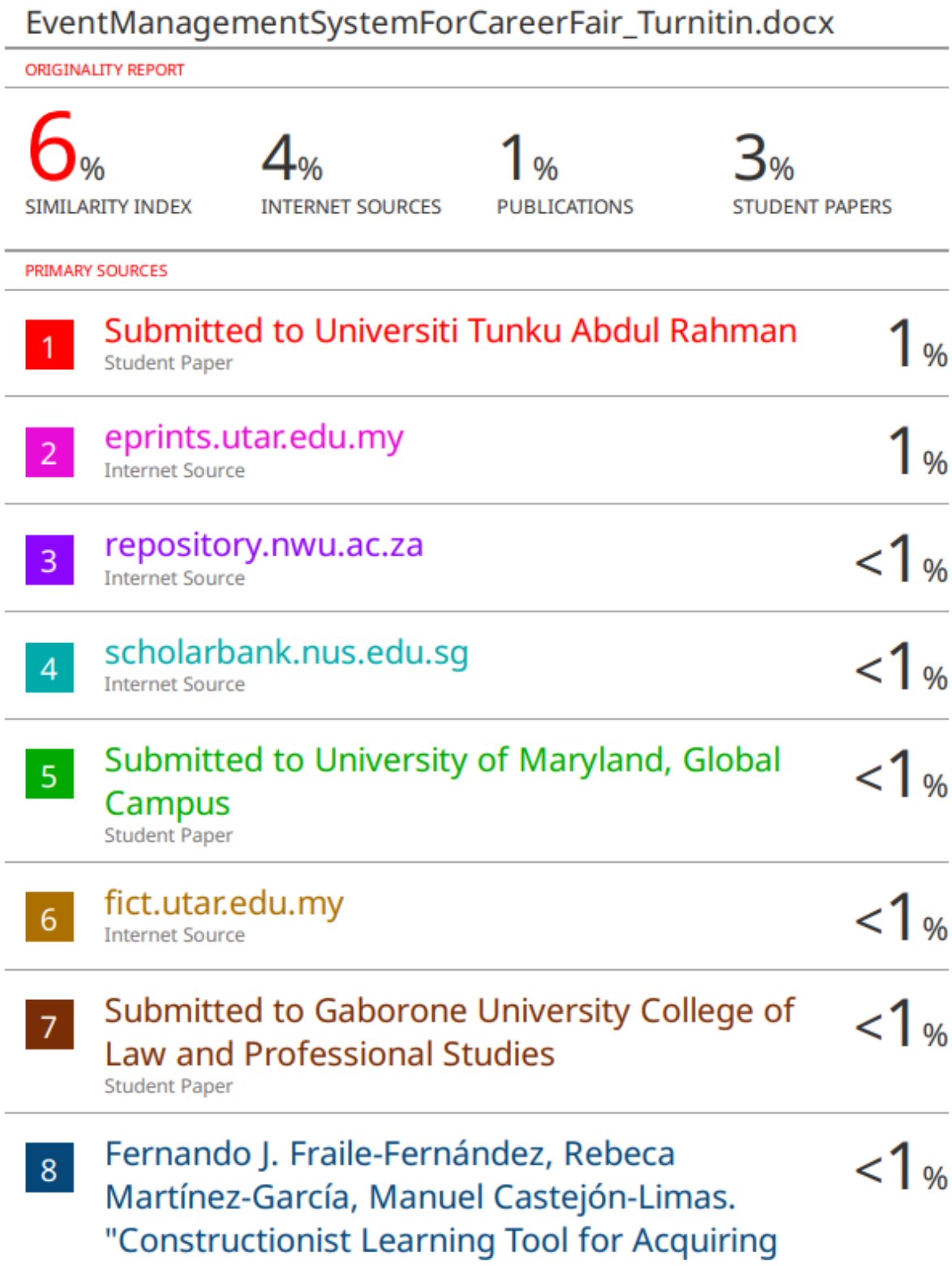
Seamlessly exchange digital business cards via personalized QR codes—share contact info, social media, and more instantly

QR CODE INTEGRATION FOR CLOUD DOCUMENTATION



Use QR codes for ticketing, networking, and sharing resources like contact info, brochures, and resumes.

PLAGIARISM CHECK RESULT



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Full Name(s) of Candidate(s)	LEE WEN XUAN
ID Number(s)	20ACB05688
Programme / Course	BACHELOR OF INFORMATION SYSTEM (HONOURS) DIGITAL ECONOMY TECHNOLOGY
Title of Final Year Project	EVENT MANAGEMENT SYSTEM FOR CAREER FAIR

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Signature of Supervisor

Name: Ammar bin Azlan

Date: 12/9/2024

Signature of Co-Supervisor

Name: _____

Date: _____

UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF INFORMATION & COMMUNICATION TECHNOLOGY
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Student Name	LEE WEN XUAN
Supervisor Name	ENCIK AMMAR BIN AZLAN

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