# Grad Ready: Enhancing graduate readiness through intelligent mobile application

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**Abstract:** Graduates experience significant challenges when moving from academic environments to the job market. The issues include a shortage of practical experience, a disparity between their academic knowledge and companies' requirements, struggles with resume building, and challenges in job searching. The application designed to facilitate the graduates' transition into the job market is called "The Grad Ready". It is an intelligent mobile app that bridges the gap between academic knowledge and the professional skill requirements for computer science graduates using matching algorithms to enable companies to target and recruit them. The Waterfall software development methodology was used for it. The requirements were determined by conducting a survey with students ready to graduate from the computer science department. Following the design, implementation, and testing phases, the application was successfully completed, resulting in the development of a user-friendly and intelligent solution meeting all the intended goals and performance criteria.

**Keywords:** Grad Ready, Mobile Application.

## 1. Introduction

The steady development of mobile applications has impacted various sectors, including education and business. This progress has led to a significant increase in the use of applications for various purposes, improving efficiency and accessibility in these areas. In education, mobile learning assists students in building technological and a variety of other skills, finding answers to their questions, adopting collaboration, and enabling knowledge sharing (Al-Emran, Elsherif & Shaalan, 2016). Most of the current generation in universities cannot imagine the world without mobile technology. As a result, students are familiar with using mobile apps for education and communication (Grant et al., 2015; Dias & Victor, 2022). Furthermore, the usage of mobile apps has increased significantly, enhancing the long-term efficiency of small and medium-sized enterprises (SMEs) by facilitating easier outreach and recruitment (Rakshit et al., 2021).

Recent graduates may face difficulties in securing job offers for several reasons. One major issue is a skill mismatch; the skills employers seek may not align with recent graduates (O'Brien, Moran & Betts, 2020). This can result from rapid technological changes, evolving job requirements, or a lack of practical experience. In such cases, graduates need to enhance their skills to meet job requirements. Another challenge is building a professional network. Graduates who struggle to establish connections may find it hard to secure job offers. Additionally, many recent graduates may lack sufficient soft skills, such as communication, teamwork, and problem-solving, which are essential in aworkplace (O'Brien, Moran & Betts, 2020).

Fresh graduates face challenges in the transition from academic environments to the professional sector, especially in the rapidly evolving domain of computer science. Thus, the "Grad Ready" app was proposed, as it is an intelligent app that uses algorithms to connect fresh graduates with job seekers, volunteer opportunities, or interesting workshops. The connection between companies and graduates is based on algorithms, so companies do not need to seek graduates' manual suggestions to employ based on graduates' qualifications and interests.

The aim of the application is to bridge the gap between academic learning and the demands of the job market. Recognizing that universities often provide strong theoretical knowledge but may lack in teaching practical skills needed for career success, Grad Ready is designed to bridge this gap. It equips fresh graduates with the necessary tools and resources for a smooth transition into their professional lives. The app also aims to work closely with large oil companies in Saudi Arabia, such as ARAMCO and SABIC. This way, students can learn things that are directly useful

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in the real world. This partnership with well-known companies guarantees that what the graduate students have received is in line with what the industry needs.

Additional aims: Grad Ready provides a user-friendly app for fresh graduates to explore additional educational opportunities easily. Moreover, it allows them to create profiles that showcase their interests and information. It also enables companies to post various opportunities, including training programs, volunteer work, and workshops. In their turn, graduates can apply for volunteer work and training programs and monitor their application status, too.

As to this paper, the related works are discussed in Section 2, the methodology and system design are provided in Section 3 , while Section 4 provides the conclusions and future directions of the study.

## 2. Related work

This section reviews some background projects that are concerned with employing people in Saudi Arabia. For instance, the Bayt.com website established by Rabea Ataya, the premier platform dedicated to advancing employment prospects and fostering career development in the Middle East and North Africa (Ataya, 2024). The website serves as a comprehensive job search platform featuring ample job listings. Additionally, the platform offers valuable assistance for resume building and personal enhancement (Ataya, 2024). Both Bayt.com and the proposed app “Grad Ready” are relevant in facilitating connections between users, job seekers, or graduates. However, Bayt.com is a general job search platform where companies post offers, and then job seekers submit their form with a broad range of job listings, while the proposed app specializes in fresh graduates only; when companies post offers, intelligent algorithms connect graduate profiles to the offers, ensuring that companies receive only relevant applications from fresh graduates who meet the job criteria. Moreover, the proposed app focuses on connecting graduates with training opportunities from companies and volunteer offers, whereas Bayt.com focuses only on job opportunities.

Another website for professional certifications is “Wathiq", an online learning platform affiliated with King Abdulaziz University (KAU), and administered by the Deanship of Student Affairs which provides a range of educational programs featuring professional certification (Deanship of Student Affairs, 2022). The website presents numerous educational programs across a wide range of majors, delivered by seasoned professional instructors. Both Wathiq and the proposed app “Grad Ready” offer professional certification programs. The differences between them are in the field each advertises: Wathiq just provides a predetermined set of educational programs, while the proposed app provides a variety of services such as finding an appropriate job, workshops, volunteer offers, and the skills needed by companies. Furthermore, Wathiq offers a diverse range of majors with seasoned instructors, so graduates need to search for a suitable program and register. They must wait until they are accepted into the program, and there are often restrictions on acceptance (Deanship of Student Affairs, 2022). In contrast, the proposed app recommends professional certificates for individual graduates based on their interests using a specific algorithm so that graduates do not spend excessive time searching or waiting for training programs responses.

The “Misk Foundation” is another similar initiative. As a non-profit organization, “Misk” is dedicated to educating and encouraging leadership among youth. Its primary mission is to invest in and empower Saudi Arabia's youth, focusing on two key areas: education and entrepreneurship, particularly in science and technology. The foundation also offers programs and collaborates with local and international organizations to achieve its goals. (Mohammed Bin Salman Foundation, 2024). The proposed project, “Grad Ready”, has a common goal with the “Misk” project in preparing qualifying graduates for the job markets and enhancing their skills through workshops. Yet, “Misk” does not offer volunteer work or appropriate jobs. They consider top-talent graduates, leaving other graduates without the opportunity to participate in Misk workshops.

“Technical and Vocational Training Corporation” (TVTC) is a government website that provides job and training opportunities for graduates. TVTC represents a bridge between students who graduate from TVTC college and the jobs offered by the governmental and private sectors

(TVTC, 2024). The proposed application “Grad Ready” and the TVTC website share a common feature as both operate as bridges between students and companies. On the other hand, TVTC offers job opportunities exclusively for its graduate students, while the Grad Ready app provides a wider range of options: training opportunities, job opportunities, and volunteer positions for all graduates with bachelor's degrees in Saudi Arabia.

“wadhefa.com” is a website specialized in providing an interactive online environment to connect employers and qualified job seekers in Saudi Arabia (Wadhefa, 2024). The website only offers jobs, and seekers try to find appropriate positions that meet their criteria. Wadhefa.com functions as a bridge between students and companies, aligning with the proposed app's “Grad Ready” goal. However, while “Wadhefa.com” provides only job opportunities, the “Grad Ready” app offers a wider range of options.

To get a broad picture, this review also considered some other international applications and websites that connect graduates with job seekers. For example, the “Handshake” website is a website founded in 2014 and aims to help Michigan Tech University graduate students find careers across the USA. Within a few years, the website became one of the leading career sites in the country (About HandShake, 2024). Both “HandShake” and the proposed project aim to connect graduate students with employers through personalized job recommendations and good communication. However, the “Handshake” website serves students in the USA and suggests links for training and certificates there. In contrast, the “Grad Ready” application serves jobs and volunteering, offering lots of opportunities for training and courses in Saudi Arabia.

“Glassdoor” is another example of a website that offers a work community that connects companies and workers in the best match. It provides millions of job descriptions, ratings, salaries, conversations with employers, and space for sharing experiences. This website covers jobs in 20 countries, such as the USA, South America, Australia, India, and some European countries. It does not cover Arabic countries or Africa (About Us, 2024). The “Grad Ready” application and “Glassdoor” share the same idea of connecting job seekers with employers and making search opportunities easier for them. “Glassdoor” focuses on providing a healthy work community between workers and employers in around 20 countries. Again, the website does not provide training or courses it only links job seekers to external websites. On the other hand, the proposed application, “Grad Ready” focuses on graduate students in Saudi Arabia through several support methods like training, free courses, and volunteer work.

“WayUp” is an online platform that helps graduates find their first jobs in their fields in a simple way. The platform allows graduates to look for different jobs and apply directly to specific jobs or upload their resumes and wait for the company’s response (WayUp, 2024). The idea of this platform is similar to the proposed application “Grad Ready”. Both of them provide simple platforms for connecting graduates with companies. “WayUp” is a very simple platform that only links job seekers with companies with no other features. In contrast, the proposed application provides several features such as training, free courses, certificates, and volunteer jobs to empower the graduates’ resumes.

After discussing similar projects, the “Grad Ready” project gained valuable insight. Projects mentioned in the related works section provided the study team with a better understanding of how such initiatives work and helped identify the requirements for developing the “Grad Ready” application by understanding the unique features and strengths of the project, which offered valuable insights into the diverse career development and education initiatives in the Middle East. This ensures that our app remains relevant by facilitating connections, presenting training opportunities, and offering strategic recommendations for professional certificates, which are all aligned with the specific needs of our target audience. Table 1 provides a comparison of all similar projects mentioned in this paper.

## 3. Methodology and system designed

Regarding the status of the proposed application, the waterfall software development methodology was chosen for several reasons. The project requirements needed to be closely

defined with end users, and the phases needed to be completed in sequence, with each development stage documented before the next one began. Additionally, the project's scope was stable. The waterfall model is the software development process that presents these processes in a linear sequential flow. This approach is well-suited for this project because it is predictable and can be controlled (Demirag, Öztürk & Ünal, 2023).

**Table 1.** Comparison of related works projects

| Features | Grad Ready | Bayt | Wathiq | Wadhefa | Misk | TVTC | Handshake | Glassdoor | WayUp |
|---|---|---|---|---|---|---|---|---|---|
| Connect students with company | ✓ | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ |
| Training | ✓ | | | | ✓ | | Links | Links | |
| Courses | ✓ | | | | ✓ | | Links | Links | |
| Professional certificates | ✓ | | ✓ | | ✓ | | | | |
| Volunteer work | ✓ | | | | | | ✓ | | |

In this project, the team needed to determine the requirements of the developed app in two parts. First, the team conducted a literature review and then a survey. In the second step, the "Grad Ready" app was designed, and then implemented. To ensure the proper functioning of the application, it was tested in multiple steps and maintained as needed.

## 3.1. Data gathering and results

All software developers should be aware of their software functional and non-functional requirements. Without determining these requirements, the software may result in issues during maintenance (Booch et al., 2007). Therefore, a survey and interviews focused on the requirements before initiating the system design as well as interviews with experts proved to be effective. Regarding the different categories of users who can benefit of the application, it targets graduates and company employees. Unstructured interviews were conducted with employees who have the authority to select students for internship training or jobs. However, it was challenging to find experts willing to participate in the interviews. As a result, we were able to interview two managers from the human resource department of Saudi National Bank (SNB), with about 8 years of experience, and of KAU, with 5 years of experience. Both managers encouraged us to develop this application, as it would make it easier to find appropriate graduates. They emphasized the importance of reaching candidates who meet specific criteria, such as a high GPA.

KAU Manager of HR: "When we need to contact students for training and volunteer, we first get the list of names and GPA from the Students Affairs department. We select students with high GPAs, send them emails, and then wait for responses. However, responses are sometimes delayed, and some students do not respond at all. This led us to search for other students for training, but finding those who are willing to train can be challenging"

SNB manager of HR: "If we have a platform to connect with students who are interested in training would make the selection process much easier".

On the other hand, the type of information needed from the data collected in a survey directly influences the design and development of the project (Aithal & Aithal, P.S., 2020). Thus, an online survey was conducted as part of the "Grad Ready" project to address the significant

requirements of participants in the system and to evaluate perceptions regarding their preparation and transition to becoming employees. Another purpose of the survey was to assess the level of preparation graduates felt and identify gaps between academic training and professional requirements. The survey was divided into three parts: the first part was about demographics, the other part was six questions about the features that grade students wish to include in the app, and the third part was open-ended questions to add their opinions. A total of 72 participants, students in their final semester of computer science at King Abdulaziz University, took part in the survey. The survey participants consisted of 62% female and 38% male, all within the age range of 22-23 years old.

The results of the survey show highly encouraging support for developing the "Grad Ready" app. The first question in the second part was, "When looking for a job or workshop, what methods do you use?". The responses varied, and no specific methods were identified. Figure 1 shows the different answers to the question. The purpose of this question is to understand the barriers in searching for a job and workshop. Searching through social networks was the most frequently selected response, while social platforms may not effectively support jobs and workshop discovery. Therefore, developing an application to connect graduates with companies and trending workshops could be highly effective. Figure 1 presents the results of various methods used to find any opportunities.

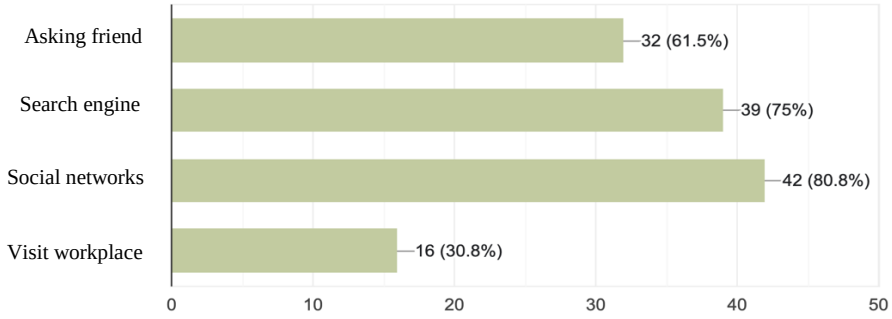


**Figure 1.** The results of various methods used to find any opportunities

One question asked the participants whether they preferred finding training and volunteer opportunities, professional certificates, and job opportunities all on one integrated platform. The reason for this question was to investigate whether graduate students prefer a unified platform that provides multiple opportunities after graduation. The participants' answers revealed that 67.3% agreed with using a unified platform, and 26.9% were neutral. Figure 2 presents the results of the question.

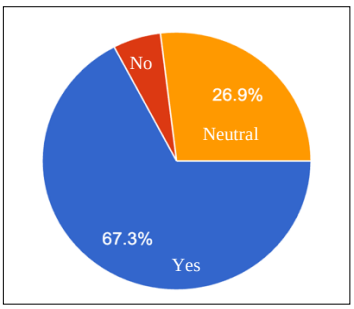


**Figure 2.** Results of the first survey question

Another positive answer to one of the questions was that individuals preferred communication methods with training, volunteers, and job providers, whether through the app or alternative methods. The majority of the participants (65.4%) preferred using an integrated platform rather than other communication tools.

The open-ended question asked about their preference for the application: "If there is an application that provides services for graduates, what would you like to be included in the app?"

Student 1: "*We want an easy-to-use application to submit my certificate and all needed documents".*

Student 2: "*I want to see all options of workshops related to my major and easily communicate with companies and get a notification if I am accepted".*

Student 3: "*I want to submit my information so it will be easy to find suitable opportunities for a job, workshop, or volunteer opportunities".*

Student 4: "*I am not sure if I want to find a job through the app, but I want an easy way to find good training and workshops to improve my skills".*

## 3.2. Results analysis

Survey and interview responses directly encouraged and suggested key features to address user needs and improve the hiring process. Collected data indicated that graduates struggle to find jobs and workshops through different connecting channels, practically on social networks. This issue led to the development of an app for job and workshop search features, making opportunity discovery more efficient. Moreover, 67.3% of the respondents preferred using a unified platform for career resources, training, and volunteering. Communication preference also influences the functionality of the app. Most users favored direct massaging over traditional methods, such as email. So, a built-in massaging system was added to real-time updates.

In an open-ended question survey, users highlighted the need for features like document upload and search filters based on their fields. This perspective directed the inclusion of a user profile document upload feature, along customized search filter, enhancing user's experience.

Interviews with HR managers revealed that they faced challenges in identifying qualified candidates quickly, often delayed when using emails. As a result, a filtering feature was developed, allowing HR personnel to select candidates based on specific criteria, such as GPA. All of these features were suggested to meet the distinct need identified through users' feedback, making it an efficient app for both graduates and companies.

After analyzing the survey, the functional requirements of the system were determined. In the proposed app, there are three different user types: graduate students, companies, and admin. The functional requirements for the graduate student user are as follows:

- **Graduated Student Profile Management:** Users can manage their profiles, including educational background, major, and interests;
- **Post Search:** Users can search for posts (training, certificates, courses, volunteer work) by name;
- **Post Filtering:** Graduated students can filter posts by type (e.g., training, certificate, course) and city;
- **Submission Status Tracking:** Users can track the status of their submissions (processing, accepted, rejected).

The functional requirements for companies are:

- **Post Management:** Users can add, edit, and delete training and volunteer work posts;
- **Application Management:** Users can review and accept/reject applications based on applicant grades and requirements.

Additionally, there are two functional requirements for the third user type, the admin:

- **Admin Certificate Post Management:** Admins can add, edit, and delete certificate posts;
- **Admin Course Post Management:** Admins can add, edit, and delete course posts.

Figure 3 shows a use case diagram that presents all the application's functional requirements.

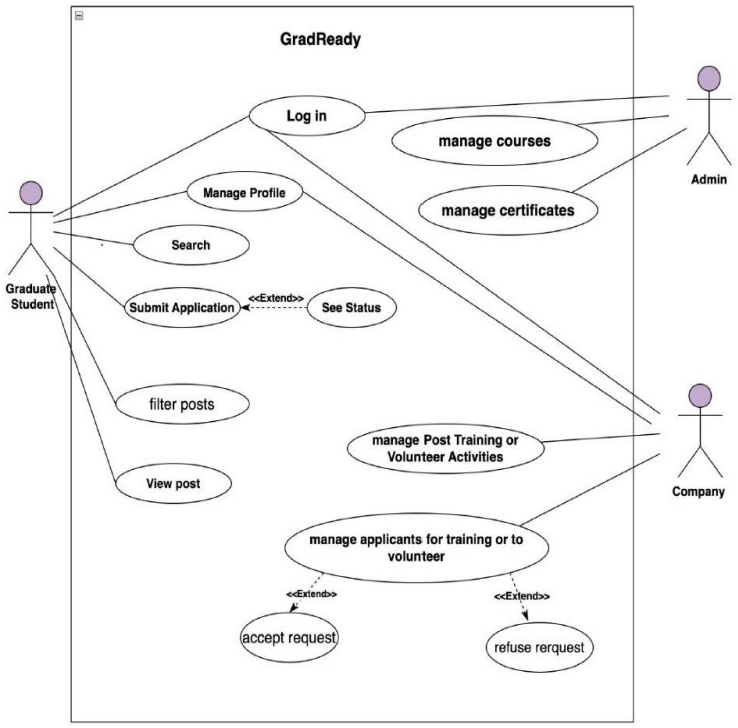


**Figure 3.** Use case diagram

After analyzing the survey data and determining the requirements, the system's structure was designed. The high-level architecture focuses on building an application that combines training, volunteer work, and educational materials into a single portal. When users input their interests and academic information, the app will recommend opportunities that align with their professional ambitions. Figure 4 shows the high-level system architecture.

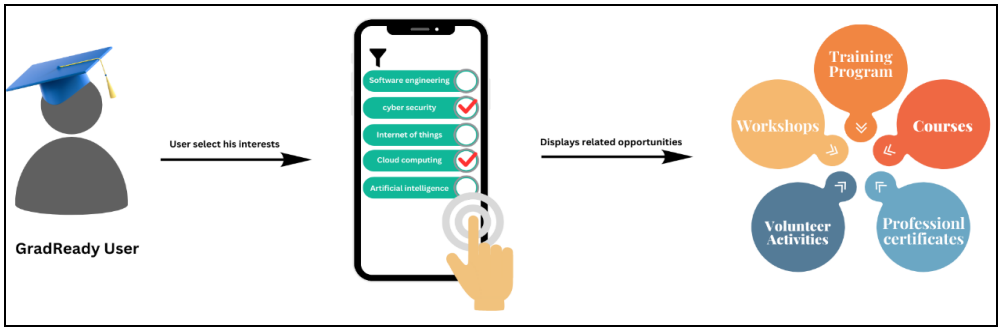


**Figure 4.** High-level architecture of the relationship between companies and users' skills

Figure 5 displays a high-level architecture that shows how specific companies' needs connect with users' skills and qualifications, ensuring a relevant and effective pairing.

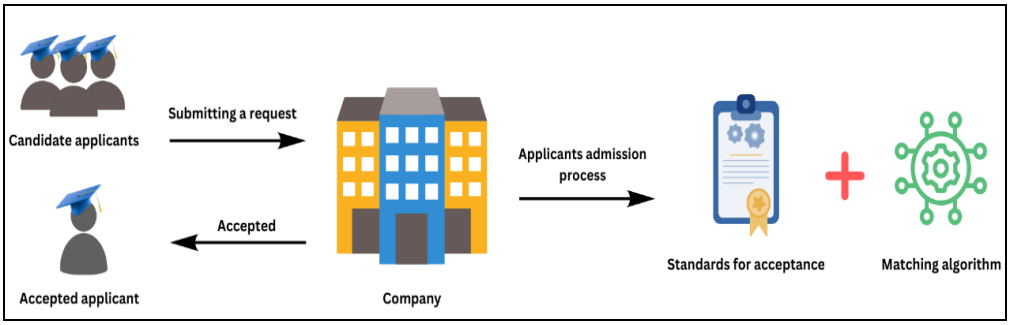


**Figure 5.** The High-level architecture

### 3.3. System implementation and tools requirement

"Grad Ready" application is an intelligent, user-friendly app. Focusing on performance, security, and ease of use is crucial to create a successful application. A mobile application can be created or developed using a variety of platforms and programming languages, such as Python or C++. The concept of object-oriented (OO) is about using classes and objects instead of functions and logic for programming. It uses several useful features that facilitate the work of programmers and construct software in components (Aggarwal et al., 2006; Agu & Elugwu, 2022). Using OO gives a chance to reuse the code in other programs, which speeds up the process of creating different applications. In addition to improving the ability to debug and maintain, OO improves security using encapsulation, which prevents unintentional modification by hiding parts of the code (Chidamber & Kemerer, 1994; Runge et al., 2023).

The features of OO are obvious in the "Grad Ready" application, where the code of the application is divided into six classes and several objects to simplify coding, as it appears in Figure 6, where the class diagram figure shows the relations between different classes and their objects and how OO helps organize the application code to make it easier to manage and understand. This feature gives the code modularity, where programmers can work on individual components and functions without affecting the entire system's code and make the implementation process faster. Moreover, there is an opportunity to add more features to the application. So, the organized code makes it easier to edit requirements or add new ones and makes it easy for debugging.

In addition, using classes helps the developer to reuse the same classes and objects within the system. This feature removes duplications in the code and speeds up implementation time. Besides that, this feature improves the communication and collaboration between the members of the implementation team. OO gives clear interfaces between system components that allow the team to work individually and collaborate again to integrate their work together.

Moreover, OO helps in testing and debugging. During system implementation, it was easy for each member to work individually to test each unit component and find errors quickly and easily get rid of them. After that, it was easy to test integrated units together with the collaboration from the developers of the units.

Therefore, it was for the above reasons, that OO was selected to develop the application. Also, the team explored another valuable tool, Firebase Database used as a cloud-based NoSQL database for real-time data storage. Firebase was appropriate for the project because it offers real-time data storage and synchronizes the application users. Cloud Firestore lets you securely store, sync, and query app data globally (Khawas & Shah, 2018). Flutter Flow is another tool that was used. "*It is a visual development environment for building native mobile and web applications*" (FlutterFlow, 2024). Flutterflow provides a strong foundation for application development, simplifying the process with a visual interface and code generation. It uses Flutter's extensive widget library to offer significant flexibility (Fadaee, 2024).

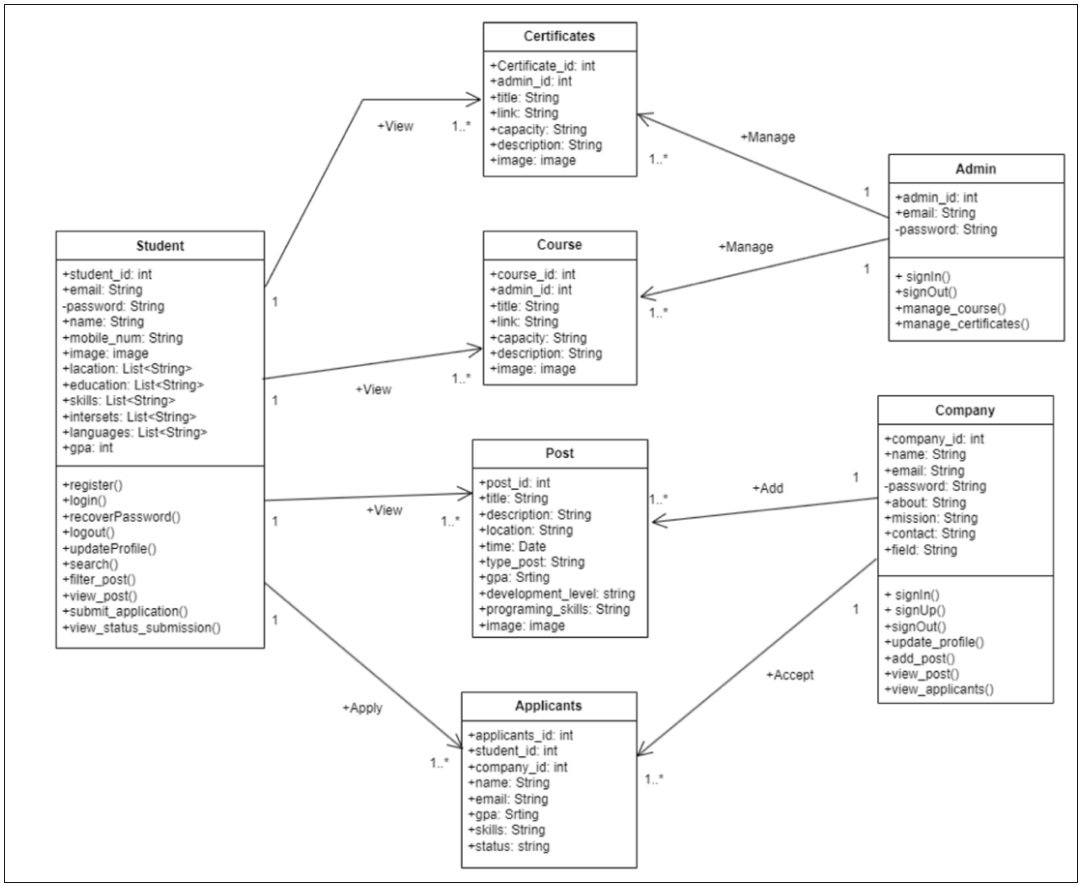


**Figure 6.** Class diagram of the application

### 3.3.1. System Scenario

Users start with the welcome page, which introduces the app with a logo, background, and brief description. The login page includes fields for user credentials, a 'Forgot Password' option, a login button, and a 'Sign Up' button for account creation. When company users register, they are directed to the company interface, which offers services such as adding posts, viewing applicants for training, viewing posts, and editing the company profile. The interface displays specific information about the company, including the company's name, logo, description, contact information, location, and other relevant details. Additionally, the profile allows the company to update and edit its information as needed. When graduate users register, they are directed to the graduate home page. Through this page, users can add information to their profile, such as qualifications, skills, and interests. The user home page allows users to view all available courses, certificates, and volunteer opportunities. Users can browse through the list of offers and apply to join them. This page serves as a central location for users to explore and engage with various learning and volunteer options. In addition, users can update their profile information and ensure that it accurately represents their skills and experiences, as shown in Figure 7.

When a company posts an offer for a specific position, only graduates who meet the offer conditions can view and apply for the post. For instance, when a company user posts an offer, they must specify conditions such as the required major and GPA. If the company user sets the required major to Information Technology (IT) with a 3.5 GPA out of 4, then only IT graduates with a GPA of 3.5 or above can see the offer and apply. Once a graduate applies for the offer, they need to wait for the company's response, whether accepted or rejected.

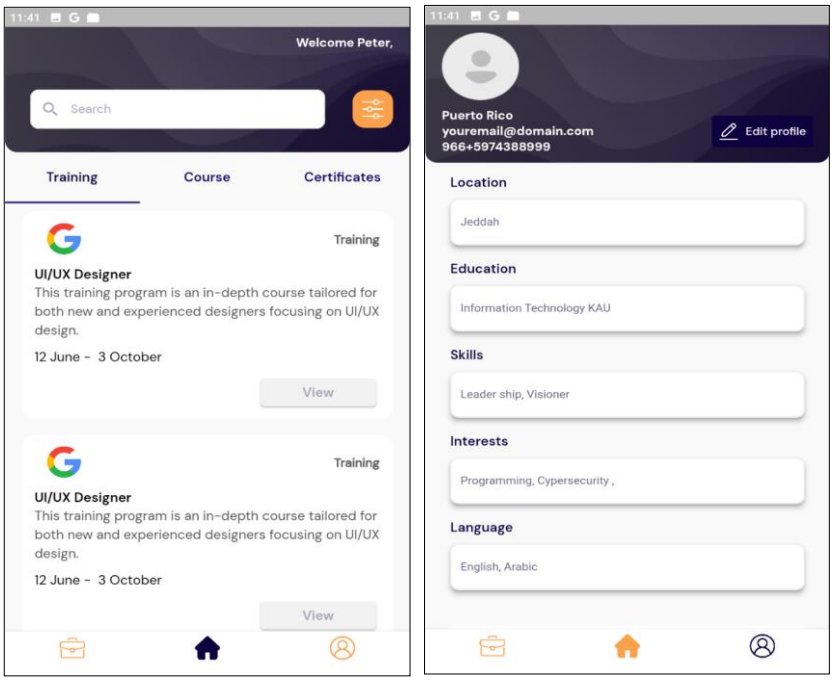


**Figure 7.** Graduate homepage screen

The request screen provides students with the ability to view their applicant requests to companies and the corresponding status of each request. Students can see the list of requests they have submitted to companies and the status of each request. The status can be categorized as "under process," "accepted," or "refused." This allows students to track the progress of their requests and determine if they have been accepted or declined by the respective companies, as shown in Figure 8.

Figure 9 shows that the "Add Post" screen allows the company to create and publish posts related to training or volunteer work. The company can input the required information and details for the post, such as the title, description, duration, requirements, and other relevant information. This screen enables the company to share opportunities and attract potential participants. The "View Post" screen allows the company to see the posts that have been published. The company can also have options to delete posts if needed.

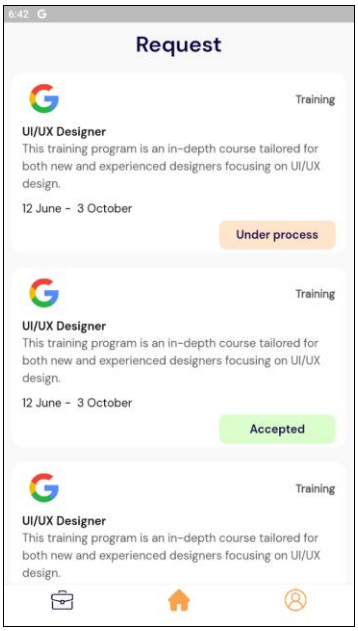


**Figure 8.** Request positions screen

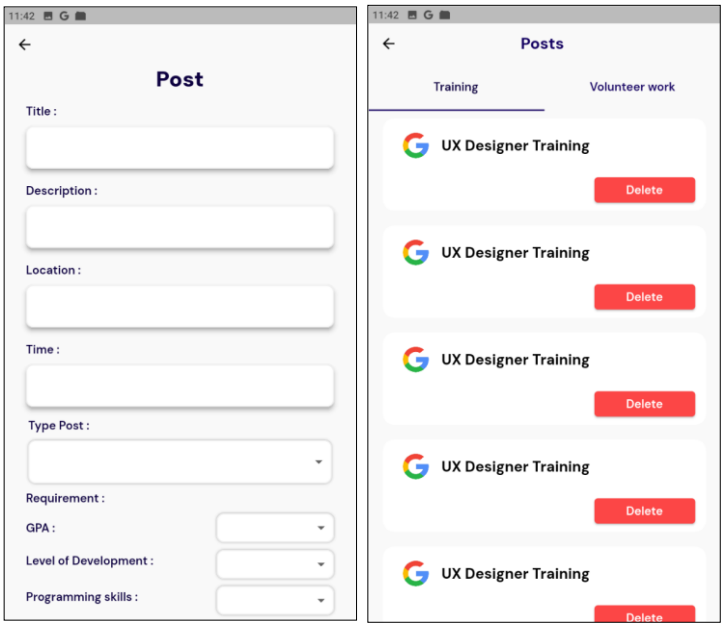


**Figure 9.** Add and view posts screens

## 3.4. System testing and evaluation

Software testing is the process of assessing a software program to identify defects or errors (Aljojo et al., 2020). Testing software ensures its performance and dependability. It effectively conveys the importance of ensuring that all functions of the software work properly and the need to test various aspects, such as integration and installation, to achieve good-quality performance (Myers et al., 2011). In the “Grad Ready” app testing, the team covered various software testing levels, including unit testing, integration testing, compatibility testing, and system testing.

Firstly, unit testing was conducted to test functions separately, ensuring their functionality against their specifications. Unit testing can involve constructors or destructors at a class level in an OO (Object-oriented) environment (Binder, 1999; Sheikh, 2022).

Unit testing was conducted using empty test code; for example, the 'Empty Email Test' is a unit test to validate Email function. It checks how the function behaves when provided with an empty email. The test expects the function to return false in this scenario. This ensures that the function correctly handles cases where no email is entered, providing a simple and straightforward verification.

Integration testing was another system testing level. It tests use case interactions or whether two components work together without errors to verify correct design and integration (Dennis, Wixom & Roth, 2019). The developed application tested combined functions to ensure an error-free flow of control and data. For example, a test of sign-up and login processes shown in Figure 10 illustrates integration testing of login processes. It verifies that when the email 'test@example.com' and password 'password123' are provided, the login operation is successful, and a non-null user object is returned. Also, the "Invalid Login Test". It verifies that when the email 'invalid@example.com' and the password 'wrongpassword' are provided, the login operation is unsuccessful, and a null user object is returned.

Moreover, a compatibility testing was conducted. The application was tested on different devices: iPhone, Pixel 2 (API 30), Pixel 3 (API 30), and Galaxy. The application worked properly on the Galaxy and Pixel 2 (API 30), with a slight delay on Pixel 2 (API 30) Android 11. However, the application failed to work well on the iPhone.

After the system was completed and tested, a system test was conducted to ensure the overall interaction of components was working without errors. The system test can cover both functional and non-functional aspects, such as usability, security, and performance (Umar, 2019). The results of the system test showed that all functions passed it and were working well.

A usability test was also conducted to ensure the application is easy to use and operates smoothly. The test involved ten participants: eight graduates and two company users. An observational method was used to evaluate the system, providing participants with a brief overview and detailed explanations of all functions and scenarios. All participants were able to use the system on their mobile devices and users were asked to conduct tasks. Graduates interacted with the system by five tasks (1) creating an account, (2) reset the password and login again with the new password, (3) editing profiles, (4) gradate searching for opportunities, and (5) forms uploading and submission. Table 2 presents the result of usability testing for gradate users’ tasks. Companies’ users interacted with the system by four tasks (1) creating an account, (2) reset the password and login again with the new password task, (3) adding posts, (4) viewing documents submitted by graduates. Interacting was avoided during the test unless a participant encountered difficulties. Proposers’ concentration was focused on taking detailed notes and capturing screenshots. Table 3 presents the company’s users’ tasks. After the users completed their tasks, they were asked to answer six questions to rate the application from 1 to 5. The averages of their responses for each question are presented in Table 4.

The results from the usability testing questionnaire indicate that all users were satisfied with the application. All questions received high ratings, with an average score of 5, except question 3. Although the average of responses for question 3 was the lowest at 4.2, it is still a high rate. Question 3 was ‘I don’t need help to complete my tasks’, which is a common response from new users of the app and it was not considered an issue, especially as the average remains above 4.

**Table 2.** Results of usability testing for graduate users

| Tasks / User no | Task 1 | Task 2 | Task 3 | Task 4 | Task 5 |
|---|---|---|---|---|---|
| 1 | time: 20s error: 0 | time: 30s error: 0 | time: 50s error: 0 | time: 7s error: 0 | time: 1m:12s error: 0 |
| 2 | time: 21s error:0 | time: 34s error:0 | time: 40s error:0 | time: 9s error:0 | time: 59s error:0 |
| 3 | time: 25s error:0 | time: 31s error:0 | time: 40s error:0 | time: 9s error:0 | time: 1m:01s error:0 |
| 4 | time: 30s error:1 | time: 35s error:0 | time: 52s error:0 | time: 18s error:1 | time: 1m:08s error:1 |
| 5 | time: 30s error:0 | time: 40s error:1 | time: 49s error:0 | time: 10s error:0 | time: 1:32s error:0 |
| 6 | time: 27s error:0 | time: 30s error:0 | time: 39s error: | time: 9s error:0 | time: 56s error:0 |
| 7 | time: 20s error:0 | time: 29s error:0 | time: 43s error:0 | time: 10s error: 0 | time: 1:00s error: 0 |
| 8 | time: 19s error:0 | time: 28s error:0 | time: 41s error:0 | time: 9s error: 0 | time: 1:01s error: 0 |
| Average time | 20s | 30s | 43s | 10s | 1m:06s |

**Table 3.** Results of usability testing for companies users

| Tasks / User no | Task1 | Task2 | Task3 | Task4 |
|---|---|---|---|---|
| 1 | time: 21s error: 0 | time: 31s error: 0 | time: 50s error: 0 | time: 5s error: 0 |
| 2 | time: 21s error:0 | time: 29s error:0 | time: 48s error:0 | time: 6s error:0 |
| Average time | 21s | 30s | 49s | 6s |

**Table 4**. The result of the post-test questionnaire

| No | Questions | Average |
|---|---|---|
| 1. | I am able to complete all task. | 5 |
| 2. | I am able to find all features easily. | 5 |
| 3. | I do not need help to complete my tasks. | 4.2 |
| 4. | The application is easy to navigate. | 5 |
| 5. | I am satisfied with the Grad Ready application. | 5 |
| 6. | I will recommend others to use the application. | 5 |

# 4. Discussions

The rapid growth in mobile applications has greatly influenced education. Also, the adaptions of mobile apps dramatically increased among small and medium-sized enterprises. However, recent graduates face challenges in securing jobs due to mismatching skills that are required by employers. Even though there have been significant advancements in developing applications and innovative ideas, there is still an insufficient number of studies focused on

addressing graduates' concerns about the transition to the next phase after graduation. Thus, the "Grad Ready" app was developed to facilitate easier communication between graduates and employers (Monteiro, Almeida & Garcia-Aracil, 2021).

Developing mobile applications for graduates in KAU was based on user requirements. Data was collected through two methods: questionnaires and interviews. Interviews with two employers were essential to obtain their perspectives about the app. They encouraged the teamto develop it by adding two new features: the ability to view graduates' information and documents based on specific conditions, making it easier to select and communicate with suitable graduates. The application includes matching algorithms to allow employers to filter graduates' information based on three conditions: GPA, programming level, and skill. Employers can select multiple conditions, and graduates whose GPA does not meet the companies' requirements can't view the relevant post that contains job offers or training. The other method used was a questionnaire conducted with 72 graduates whose responses highly encouraged the development of the app. Most responses referred to a unified platform for job searching, training, and volunteer opportunities, as they face challenges in finding offers. Currently, they rely on unofficial ways, such as social networks, and some of the graduates choose to visit workplaces in person to inquire about opportunities, which is a more traditional approach.

After determining the users' requirements, an application goes through some different phases: designing, implementing, and evaluating. To verify the developed application, a testing phase was conducted, covering various software testing levels, including unit testing, integration testing, compatibility testing, and system testing. In usability testing, graduate users participated by performing different tasks: registration, login, password change, editing profiles, and uploading files. The average time spent completing these tasks was around 3 minutes. Uploading file tasks took the longest time. Employers participated in the usability testing by performing some tasks such as registration, login, password change, adding posts, and viewing submitted documents. The average time spent completing these tasks was less than two minutes.

The results of the system test showed that all functions passed it and were working well. Nevertheless, compatibility testing revealed an issue, as the app did not work properly on iPhone devices. In addition, there has been observed that the matching algorithm, designed to connect companies' posts with graduates based on shared interests was working only in some posts. The result of the compatibility testing and usability testing will be considered for improving the application in the future.

## 5. Conclusions

The "Grad Ready" application meets the needs of graduate students and HR professionals by providing a platform for job opportunities, training, and volunteer roles. Developed with the waterfall methodology to ensure a structured approach, the project involved gathering requirements from surveys and interviews with key stakeholders, including HR managers from SNB and KAU, who emphasized the need for an integrated platform to connect with suitable candidates. A survey of 72 graduating computer science students at King Abdulaziz University showed strong support for the app, with 67.3% favoring a unified platform and 65.4% preferring integrated communication. Analyzing the survey and interview results indicated features like profile management, document upload, search filters, real-time messaging, and submission tracking, aligning with graduates' needs for career resources and employers' needs for effective candidate filtering. System testing, including unit, integration, compatibility, and usability tests, confirmed the app's functionality and smooth performance across devices, though minor iPhone compatibility issues were noted. Developed with object-oriented programming, the app incorporates Firebase for real-time data storage and FlutterFlow for flexible design. Usability testing revealed high user satisfaction, with an average rating of 5 out of 5 in most features. The project highlights how "Grad Ready" successfully bridges academia and industry by helping graduates transition into professional roles, while testing also revealed a limitation in the matching algorithm that the team is working to improve for full functionality.

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