

A Development of Job Portal Mobile Application for UTHM Students

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DOI: <https://doi.org/10.30880/aitcs.2023.04.01.050>

Received 24 Julai 2022; Accepted 11 June 2023; Available online 30 June 2023

Abstract: In this modern era, the current job search process by browsing all the online networking platforms such as websites, blogs and social media of the company is not enough. But there are still students who use this method to find a job so that they have difficulty in finding a suitable job. Therefore, an application has been proposed to overcome these difficulties. The online Job Portal Mobile Application for UTHM Student act as a job agency in UTHM. The purpose of developing this system is to help the UTHM students in searching the job. This system is specially developed for UTHM students, and they don't need to register new account since the administrator from Pusat Kemajuan Kerjaya & Alumni UTHM will register for them. This system only accepts registration from employers and company that intended to advertise their job vacancies. Job vacancies will be gathers and display to student based on searching criteria. Simple Software Development Life Cycle (SDLC) was used as methodology to develop this application. This Job Portal Mobile Application was developed using Android Studio with Java programming and Google Firebase as database. This application is expected to help students to find the suitable job for them.

Keywords: Job, Job Agency, Mobile

1. Introduction

Job is a piece of work, especially a specific task done as part of the routine of one's occupation or for an agreed price. Job can be categorized according based on skills that required [1]. Example for job categories such management, arts, science and technology, education, business, etc. Job also can be categorized by intensity (hour per week), by payment status or by the level of experience required [2]. The types of job stemming from intensity are categorized as full-time or part-time. They can also be classified into temporary, odd jobs, seasonal, self-employment, consulting, or contract employment. Regarding payment status, jobs are categorized as paid or unpaid. Examples of unpaid jobs include volunteer, homemaker, mentor, student, and sometimes intern. Finally, according to the level of experience required, jobs are usually grouped as entry level, intern, and co-op [3].

In the current process, most of UTHM students are still struggle with job searching. Some of them were looking for job through advertising, blogs and social media such Facebook, Instagram, Twitter etc. Students need to visit the company by their own to submit the resume. They also need go through with some process before proceeding with the interview. There are panels will appoint to interview the applicants. During the interview process, the panels will evaluate the applicants and select the best person to recruit. Most of student or fresh graduate have low chance to get the job because they need to compete with others applicant that have more experiences than them. They also would like a job that meet their qualification, skills, and salary. Some companies do offer a small number of wages to the fresh graduate or offer a work that does not use their skill and this will cause the fresh graduate to find another company that can fulfill their demand.

The whole process of job searching a lot of weakness because it takes a lot of efforts and time to find a suitable job that fit student's demand. It is hard for students to find a job because there were not a lot of job opening in social media, blogs and advertising. Moreover, pandemic covid-19 make it worse because a lot of company was bankrupt and not be able to operate anymore. Therefore, the resume submission required applicant's physical to hand it over. This could be an inconvenient to the students due to the location that maybe far from their home. Moreover, the students need to fill the application forms and submit their resume or curriculum vitae before proceeding with the interview. The process is inconvenient to the students because it will take a lot of their time.

Hence, a job application is proposed to help UTHM students to find their desire job by their educational level, skills and experiences and to help employers to find their potential employees based on required skills and experiences in organization's field. A job portal also known as career portal, is a modern name for an online job board that helps applicants find jobs and aids employers in their quest to locate ideal candidate [4][5]. It helps to advertise various of jobs from various companies and became a bridge that connect applicants and employers. Job portal can manage job vacancies, job details, bio data etc. Due to rapid development of technology, online job portal is reasonable because the use of internet is frequent among society nowadays. Therefore, this system is useful for the employers to provide job catalog and information to users of this system and helps them to make decision before applying for the job.

This paper contains five sections. Section 1 describe the context of the project. Section 2 explains the related work of the project. Section 3 describe the methodology used in the project. In section 4, implementation is explained. Lastly, section 5 explains the conclusion for the project.

2. Related Work

2.1 The Case Study: Job's Searching Process Among Students

Current process of job searching is performed not systematic by browsing through all the online network platform such company's website, blogs and social media. Through these platforms, student need to apply the job by handing the employer their resume by hand or email. The process of handing the resume by hand requires the student to attend the company physically where it is inconvenient for student who live far from the company. After the evaluation of the resume, student need to attend the interview conducted by the company's employer. During the interview process, the panels will evaluate the applicants and select the best person to recruit. Most of student or fresh graduate have low chance to get the job because they need to compete with others applicant that have more experiences than them. Students need a platform that can help them to find job more easily. Hence, an application is proposed to help the student to find job which is Job Portal Mobile Application for UTHM Students. This proposed application will act as a job agency for UTHM students.

2.2 Advertisement Management System

In this modern era, advertising has become a part of our lives. With the large market of product, consumers influenced by a great advertising provided by the advertiser. Example of product advertisement are McDonalds spicy fried chicken, shampoo by Dove, and goat milk by Farm Fresh. Advertising is a non-paid personal form of presentation and promotion ideas, good-services by an identified sponsor [6]. Advertising management is a process of employing various platform of media to advertise product or service for various purpose [7]. This process includes media campaigns that seek to inform and attract people regarding the particular good or service offered. Advertising management process begins from the market research phase to help the organization to define the outline of the campaign and design advertising strategy before launching the product. Advertisement management system is a process of advertising product or service through online platform only. Advertisement management system is using Internet as advertising media. In this system, users can create ads for their product and also can select which website or online application that they want to publish the ads. Hence, advertisement management system is implemented in job portal mobile application to publish the job vacancies in the application. All the job advertisement will be organized by their categories. The proposed system will allow employers to post job, update and delete the job. To make it more convenient for employer to use manage the job, the proposed system also will allow employer to add duration for the job to advertise.

2.3 Mobile Application

In the modern age of information and communication system, the use of mobile application and development is rapidly growing [8]. A mobile application is a software application that is designed to run on a mobile device such as smartphones, tablet, and smartwatch. Mobile application is an innovation of the technology's development that growth rapidly. Mobile applications can support different platform such iOS and Android. Mobile application is different from desktop application whereas it designed to be run on desktop computer. Mobile applications are running on a small hand hold mobile devices which is moveable, easy to use and accessible from anywhere and any place [9]. The smaller display of mobile compared to the desktop and different styles style of user interaction have major impact on interaction design for mobile applications, which is an influence to the development of mobile application [10]. This mobile application will help the students to access the application for job finding more easily and efficiently.

2.4 Study of Existing Related System

In line with technological advances, various job portal applications have been developed to make it easier for people to find jobs and help employers advertise job vacancies more effectively and more importantly save costs. Three chosen existing system are studied and analyzed to get more information to develop the Job Portal Mobile Application for UTHM Student. The chosen existing system are MauKerja, Jora Jobs, and JobStreet.

Table 1: System's Comparison

Features/System	MauKerja Application	Jora Jobs Application	JobStreet Application	Job Portal Mobile Application for UTHM Student
System Platform	Online	Online	Online	Online
User Registration	Registration account needed for the first-time user.	Registration account needed for the first-time user.	Registration account needed for the first-time user.	Registration account needed for the first-time user. Only employer can register.

User Login	User can login the system using registered account.	User can login the system using registered account.	User can login the system using registered account.	Employer can login the system using registered account. Student can login using SMAP id and password
Update user profile	User can update account profile.	User cannot update account profile.	User can update account profile.	User can update account profile.
Display job on menu page	Job advertisement displayed on menu page	Job advertisement displayed on menu page	Job advertisement displayed on menu page	Job advertisement displayed on menu page
View job description	User can view job requirements and description.	User can view job requirements and description.	User can view job requirements and description.	User can view job requirements and description.
View company profile	User can view company profile.	User cannot view company profile.	User can view company profile.	User can view company profile.
Upload resume	User can upload resume.	User can upload resume.	User can upload resume.	User can upload resume.
Apply job	User need to fill a form before can apply.	User need to fill a form before can apply.	User need to write additional information for employer before can apply.	User can apply without fill any form.

Based on the comparison in Table 1, it can be concluded that the three existing and proposed system have a lot similar feature. But the advantage of proposed system is the applicants can login into the system using SMAP id and password while the three existing system need the user to register account first. Moreover, applicants of the proposed system can apply the job without fill any form.

3. Methodology

This section describes the methodology of the project and its findings.

3.1 Simple SDLC

Software Development Life Cycle (SDLC) is process used by the software industry to design, develop and test high quality software. The SDLC model is a series of steps that helps for the software development process. Table 1 shows the phase and activity during system development.

Table 2: Phase and Activity During System Development

Phase	Activity	Deliverables
Analysis	Collect and analyse the information	System requirements. Software and hardware requirements. Swimlane Diagram Use Case Diagram Class Diagram. Sequence Diagram.

Phase	Activity	Deliverables
		Activity Diagram. Requirement Definition
Design	Design interface of the whole system by using the correct programming language.	System architecture Database Scheme. Data dictionaries. System interface design.
Implementation	Write programming code.	JAVA programming. Code program.
Testing	Conduct functionalities and user acceptance testing on the system and repair the fault of the system.	Prototype system. Test plan Test cases

3.2 System Requirement Analysis

System Requirements Analysis is a process of determining the outcome of the system at the end of its development. During the development of the system, requirements are formed to determine the user's expectations of the system and also how the system should be developed. System requirements include functional and non-functional and user requirements. Table 2 shows the functional requirements of the proposed system and table 3 shows the non-functional requirements.

Table 3: Functional requirements of the Proposed System

Module	Description
Registration	<ul style="list-style-type: none"> The system should allow new user to register before login into the system. The system should redirect user to the login page after successful register.
Login	<ul style="list-style-type: none"> The system should allow user to login into the system using registered id and password. The system should only allow user to login using valid id and password. The system should not allow a user login into the system with invalid id and password. The system should alert user with invalid id and password. The system should redirect user to the main menu after successful login.
Menu	<ul style="list-style-type: none"> The system should allow the user to view all the job post. The system should allow user to use search box to search a job. The system should redirect user to the job vacancies information page after user click the job post.
Job Vacancies Information	<ul style="list-style-type: none"> The system should allow user to view the job information details. The system should allow user to view the company information details.

Module	Description
	<ul style="list-style-type: none"> The system should enable user to apply for the job.
User Profile	<ul style="list-style-type: none"> The system should allow the user to update their personal information. The system should allow user to upload their resume.
Manage Job Vacancies	<ul style="list-style-type: none"> The system should allow employer to add new job posts. The system should allow employer to update the information of the job posts. The system should allow employer to delete the job posts.
Data Module	<ul style="list-style-type: none"> The system should allow administrator to see the total of users and job posts. The system should allow administrator add new students into database. The system should allow administrator to view student profile.

Table 4: Non-Functional Requirements

No	Requirements	Description
1	Performance	<ul style="list-style-type: none"> The system should be accessible at any time. The module should be load in 3 second.
2	Operational	<ul style="list-style-type: none"> The system should be user friendly. The system should be use on Android platform.
3	Security	<ul style="list-style-type: none"> Only registered user only can login into the system using valid id and password. Only administrator can access and the sistem and maintain the system.

3.3 System Analysis

System design describes the overall structure or flow of the system including the function of the system. Indirectly, it will reduce the gap between the needs and the proposed system. It also transfers the proposed system functionality into the graphical diagram according to specific requirements. In this section, the system design of the proposed system is described. UML Specification is used to generate the UML diagrams which are Use Case Diagram, Activity Diagram, Sequence Diagram and Class Diagram.

Use case diagram is a visual tool that help developers to have more common understanding of the system's end users and domain experts [11] and widely used to describes requirements and desired functionality of software products [12]. Use case diagram represent the users of the Job Portal Mobile Application system which are student, employer and administrator. Moreover, use case diagram will describe the flow and design of the system more clearly. Figure 1 shows the use case diagram that represents the overall activity of the application.

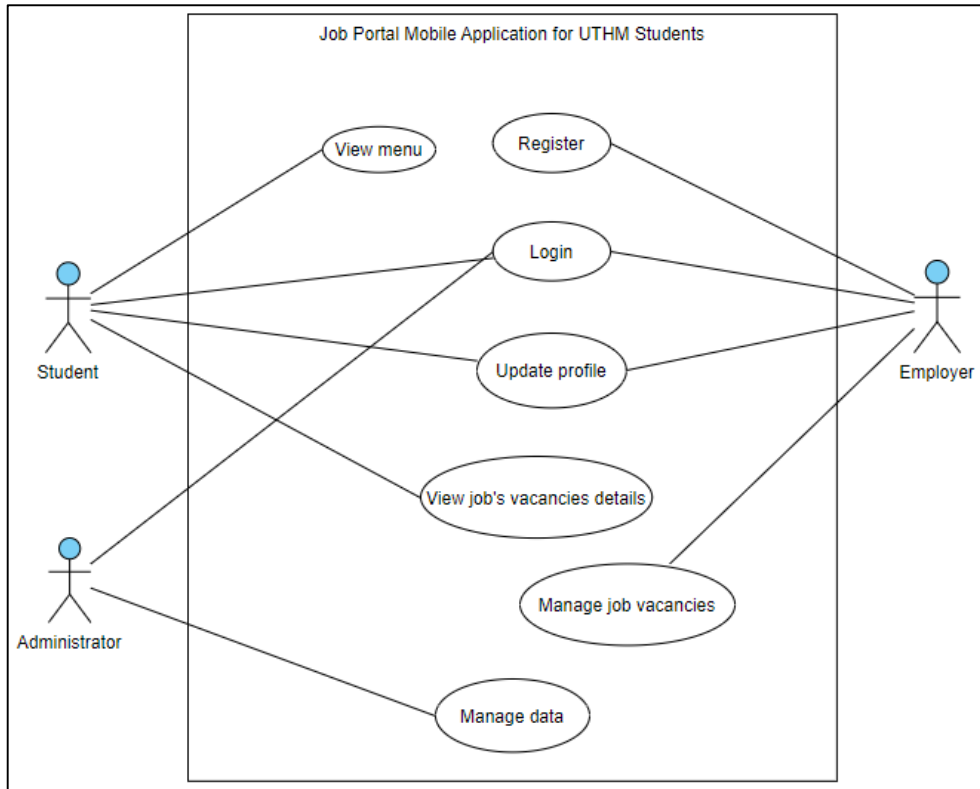


Figure 1: Use case Diagram of Proposed System

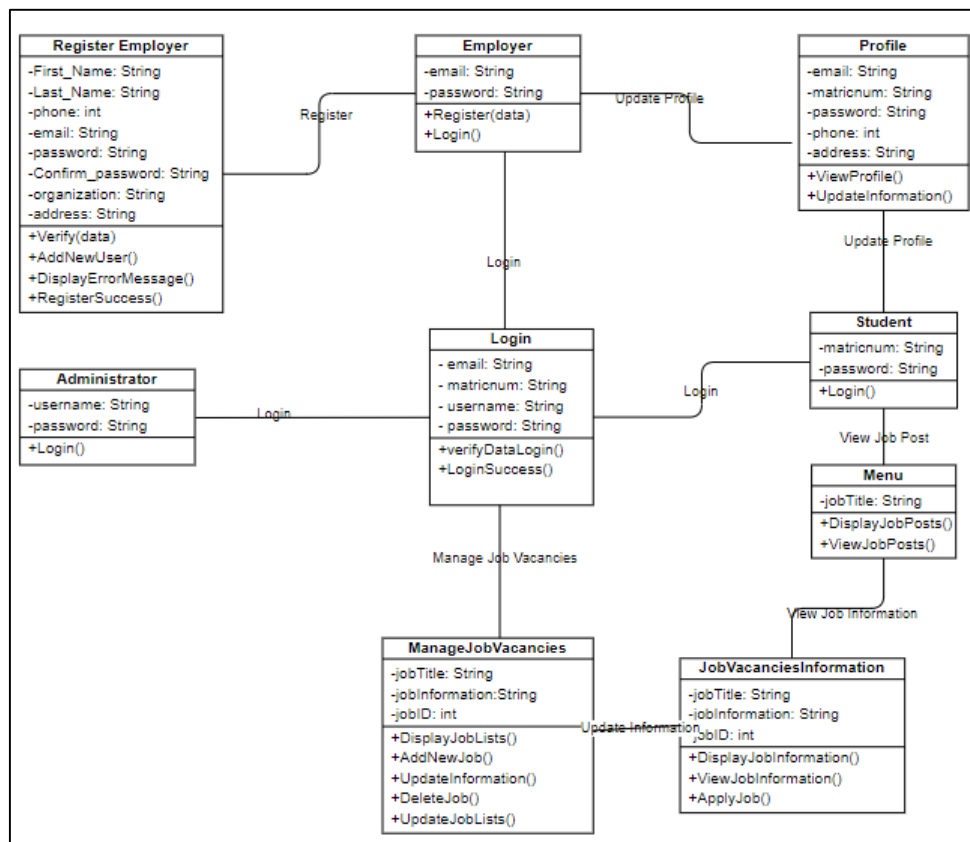


Figure 2: Class Diagram of Proposed System

Class diagrams represent the system's static characteristics, the classes required for system implementation, the relationships between classes and the properties and methods of each class [13]. It describes the static view of an application [14]. Class diagrams describe the structure of the system by using the attributes and operations of a class. Figure 2 shows the class diagram for the proposed system.

3.4 Schema Table

The following are the tables from the database that have been designed and extracted from the class diagram.

Table 5: Student Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
matricnum	VARCHAR	8	No	Primary	Student's matric number
password	VARCHAR	16	No		Student password

Table 6: Employer Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
email	VARCHAR	8	No	Primary	Employer's email
password	VARCHAR	16	No		Employer password

Table 7: Admin Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
username	VARCHAR	8	No	Primary	Admin username
password	VARCHAR	16	No		Admin password

Table 8: Register Employer Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
First_name	VARCHAR	8	No	Primary	Employer first name
Last_name	VARCHAR	50	No		Employer last name
phone	INT	12	No		Employer phone number
email	INT	12	No		Employer email address
password	VARCHAR	16	No		Employer password

Confirm_password	VARCHAR	30	No	Employer confirm password
organization	VARCHAR	30	No	Employer organization name
address	VARCHAR	50	No	Employer address

Table 9: Login Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
email	VARCHAR	20	No	Primary	Student's matric number
matricnum	VARCHAR	20	No	Primary	Employer's email
username	VARCHAR	20	No	Primary	Admin username
password	VARCHAR	20	No		User password

Table 10: Profile Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
email	VARCHAR	50	No		Employer email
matricnum	INT	12	No		Student matric number
password	VARCHAR	16	No		User password
phone	VARCHAR	50	No		User phone number
address	VARCHAR	50	No		User address

Table 11: Menu Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
jobTitle	VARCHAR	20	No		Title of the job

Table 12: JobVacanciesInformation Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
jobID	INT	5	No	Primary	Title id
jobTitle	VARCHAR	20	No		Title of the job
jobInformation	VARCHAR	100	No		Description and requirement of the job

Table 13: ManageJobVacancies Table

Attributes	Data Type	Size	Constraints		Descriptions
			Null	Key	
jobID	INT	5	No	Primary	Title id
jobTitle	VARCHAR	20	No		Title of the job
jobInformation	VARCHAR	100	No		Description and requirement of the job

3.5 Design

This section presents the system design, database design and user interface design. Figure 3 shows the architecture of the system that is used to illustrates the environment of the system.

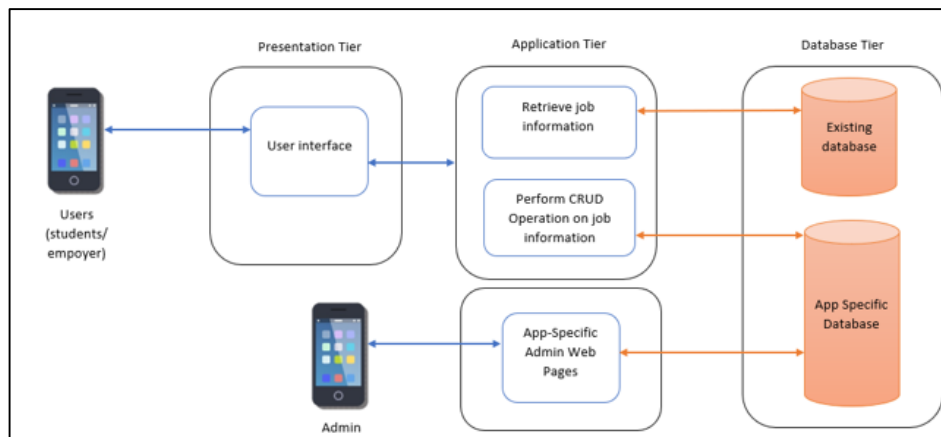


Figure 3: System Architecture of Proposed System

The user interface design is demonstrated in the following Figure 4, Figure 5, Figure 6, Figure 7, Figure 8, Figure 9 and Figure 10.



Figure 4: Login Interface

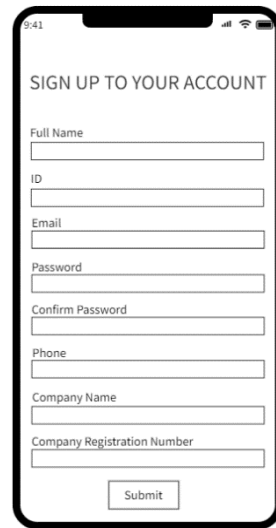


Figure 5: Register Interface for Employers

Figure 4 shows the login interface for users. From this interface, users need to insert valid id and password. For employers that does not have registered id and password, employers must register account first. Figure 5 shows the register interface for employers. Employers need to insert name, id, email, password, company name and company registration number. After login, students will redirect to figure 6 which is menu interface. In this interface, students can view all the job vacancies posted by employers. Figure 7 shows the job information interface. In this interface, students can view all the details of the job vacancies. Figure 8 shows manage job interface. In the interface, employers will to manage job vacancies. Employers can add new job post, update the current job post and also delete the current job posts.



Figure 6: Menu Interface



Figure 7: Job Information Interface

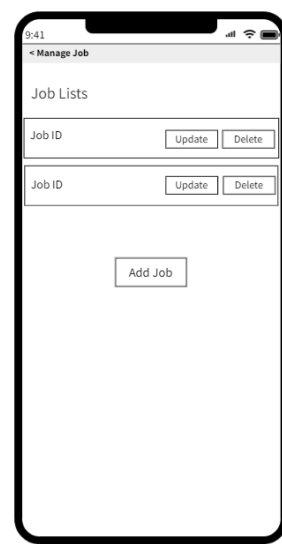


Figure 8: Manage Job Interface

Figure 9 and Figure 10 shows the profile page for students and employers. In these interfaces, users can update their information. Students can upload their resume in this interface.

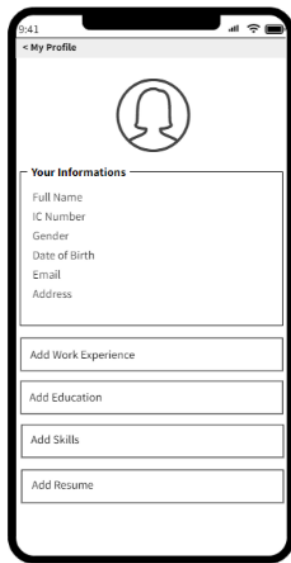


Figure 9: Student Profile Interface

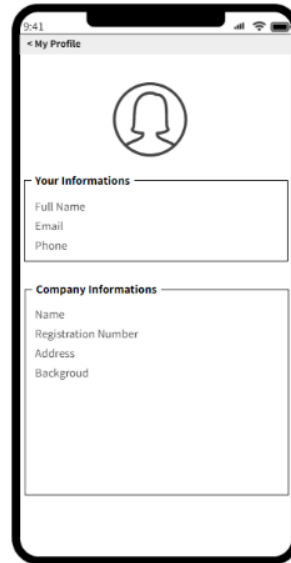


Figure 10: Employer Profile Interface

4. Results and Discussion

The implementation process that involved are based on the requirements and design created in the analysis and design phase.

4.1 Functional Testing

Table 14, 15, 16, 17, 18, 19, 20 shows the test case conducted for every module.

Table 14: Registration Module Test Case

Test Case ID	Software Requirement Specification	Description	Pass/Fail
TC_100_101	SRS_REQ_101	System shows register page view	Pass
TC_100_102	SRS_REQ_102	Users register with input personal data	Pass
TC_100_103	SRS_REQ_103	System display error message if the registration is not successful	Pass
TC_100_104	SRS_REQ_104	System store user information in database once registration successful	Pass

Table 15: Login Module Test Case

Test Case ID	Software Requirement Specification	Description	Pass/Fail
TC_200_201	SRS_REQ_201	System shows login page view	Pass
TC_200_202	SRS_REQ_202	Users sign into the system with valid id and password	Pass
TC_200_203	SRS_REQ_203	System display error message if id or password is invalid	Pass

Table 16: Menu Module Test Case

Test Case ID	Software Requirement Specification	Description	Pass/Fail
TC_300_301	SRS_REQ_301	System shows available job vacancies' posts	Pass
TC_300_302	SRS_REQ_302	Students select desired job	Pass

Table 17: Job Vacancies Information Module Test Case

Test Case ID	Software Requirement Specification	Description	Pass/Fail
TC_400_401	SRS_REQ_401	System shows information details of the job vacancies	Pass
TC_400_402	SRS_REQ_402	Students view company profile	Pass
TC_400_403	SRS_REQ_403	Students apply the job	Pass
TC_400_404	SRS_REQ_404	System display confirmation message if successful apply the job	Pass

Table 18: Profile Module Test Case

Test Case ID	Software Requirement Specification	Description	Pass/Fail
TC_500_501	SRS_REQ_501	System shows profile view	Pass
TC_500_502	SRS_REQ_502	Users edit profile	Pass
TC_500_503	SRS_REQ_503	Users upload resume	Pass

Table 19: Manage Job Vacancies Module Test Case

Test Case ID	Software Requirement Specification	Description	Pass/Fail
TC_600_601	SRS_REQ_601	Employers add new job post	Pass
TC_600_602	SRS_REQ_602	Employer delete job post	Pass
TC_600_603	SRS_REQ_603	Employer update information of the job post	Pass
TC_600_604	SRS_REQ_604	System shows applicant's list	Pass
TC_600_605	SRS_REQ_605	Employer view applicant's profile	Pass
TC_600_606	SRS_REQ_606	System stores the information in database	Pass
TC_600_607	SRS_REQ_607	System shows job post list	Pass

Table 20: Data Module Test Case

Test Case ID	Software Requirement Specification	Description	Pass/Fail
TC_700_701	SRS_REQ_701	System shows database page	Pass
TC_700_702	SRS_REQ_702	Administrator register new user	Pass
TC_700_703	SRS_REQ_703	System stores the new user's information	Pass
TC_700_704	SRS_REQ_704	System shows list of users	Pass

4.2 Result

The user test was conducted and a total of 21 respondents were involved in this test and their feedback was recorded through questionnaires using Google Form. Table 21, Table 22, Figure 11 and Figure 12 shows the result of evaluation for interface and system module according Likert scale that has been set, namely 1 (Strongly disagree), 2 (Disagree), 3 (Neutral), 4 (Agree) and 5 (Strongly agree).

Table 21: Interface Evaluation Result

No	Question	Scale					Total
		1	2	3	4	5	
1	The interface is user-friendly	0	0	0	2	19	21
2	The interface design have minimum error	0	0	0	7	14	21
3	The content layout is arranged appropriately	0	0	3	5	13	21
4	The color background used is interesting and appropriate	0	0	2	6	13	21

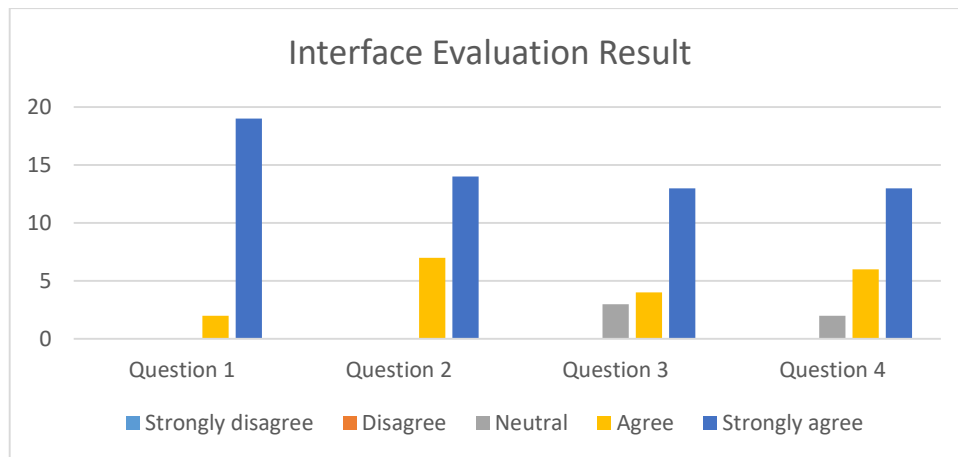


Figure 11: Graph Bar for Interface Evaluation Result

Table 22: System Module Evaluation Result

No	Question	Scale					Total
		1	2	3	4	5	

1	User can easily register new account.	0	0	0	2	19	21
2	User can login into the system without any difficulties.	0	0	0	2	19	21
3	User can view the list of job advertisements.	0	0	0	2	19	21
4	User can view the job details and click apply button.	0	0	0	2	19	21
5	User can view and edit profile.	0	0	0	2	19	21
6	User can add, update and delete job post.	0	0	0	2	19	21

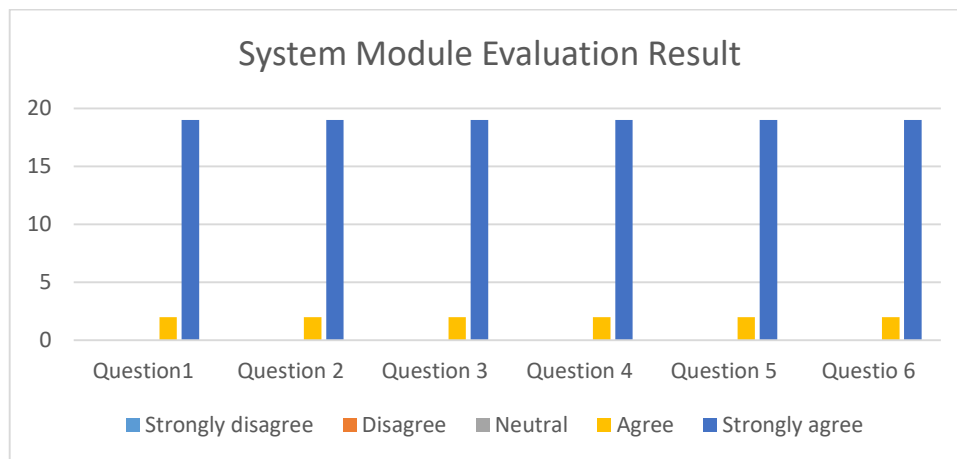


Figure 12: Graph Bar for System Module Evaluation Result

5. Conclusion

In conclusion, Job Portal Mobile Application for UTHM Students can help students in order to search a job and employers to find an employee. The advantage of the system is the falsifying documents' case can be reduced because employers can assure that the students' data are legit as they are pulled from UTHM's database. Moreover, students do not need to register account as they can login with their SMAP id and password. Employer can post job advertisement and able to update and close the advertisement. Employer also can edit their profile and view student profile. There are several recommendations that can be implemented in the future to improve the Job Portal Mobile Application for UTHM Students. Firstly, develop a mirror system for iOS. The entire system should be developed and deployed to allow devices operating on the iOS environment to also be able to use and access the system. Secondly, back up data to another remote database. The entire data stored in the Firebase should be backed up and stored on another remote storage that will be updated weekly from the original Firebase. This is done to avoid total data loss in case Firebase occurs some unexpected issues.

Acknowledgment

The authors would like to thank the Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn Malaysia for its support.

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