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Career Finder System using Rule-Based Filtering for University Student Candidates

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Abstract: As a current reality, students are frequently questioned about a suitable career path for the future, but they are unaware of the jobs offered by current industries. Moreover, students seeking university admission frequently encounter difficulties selecting courses and educational programs, and they are confronted with a variety of available courses. This research aims to make a mobile application for students to obtain employment career options appropriate to their educational qualifications because student is often asked about a suitable career for their future but have no idea about the available career path that appropriate. The methodology that implements in this research is Mobile Application Development Life Cycle (MADLC) that have four phases which is identification, design, development, and testing. The Visual Studio Code with Flutter plugin is used to develop the mobile application and its function. Firebase is used to get the database to store all the data and works as backend function of the application. The finished system was tested accordingly based on the functionality that listed all available function of the system. The system considers students' educational qualifications and academic achievements to provide personalized recommendations. This system can assist students in making career decisions and pursuing the right career path, saving them time, and reducing the risk of making wrong choices. This research indicates understanding the importance of career decision-making for students before continuing their university studies. In conclusion, this research seeks to enhance the ability of students to make decision of the available career path provided through recommendation system.

Keywords: Career Finder System, Decision Making, MADLC, Rule-Based Filtering.

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1. Introduction

Career decision-making is the process of determining career choices, and it has become a regular and challenging topic in today's world of work. Career decisions have been among the most critical decisions someone has to face. They may involve selecting an occupation and the educational training associated. Career decision affects whether somebody has to stay at a job or transition to another, formally and informally take advanced training, and so on. When confronting such decisions, many persons encounter difficulties that often discourage them from making good choices or lead to choosing a non-optimal solution. Thus causing students to frequently change career choices during university learning sessions in the middle of the semester, leading to a waste of time and costs spent while at university. The earlier career decision-making process has behavioral consequences. Gati, Krausz, and Osipow [1] suggested three probable implications for a person who faces difficulties deciding on a career. First, the individual may postpone initiating the process mainly due to a lack of motivation, low self-efficacy in career decision-making, flawed beliefs, or general indecision. Second, a person may begin the process but abandon it before deciding due to a lack of information about self, career alternatives, or internal or external conflicts. Thirdly, one may choose an inadequate alternative due too little accurate information and insufficient knowledge on how to make career decisions.

Moreover, the influence of an influential person or other obstacles or restrictions (for example, financial difficulty) prevents the optimal alternative from being realized [2]. The information and technology revolution has changed individuals' job choices. There is an increasing demand for workers in science, technology, engineering, and mathematics, although numerous jobs will disappear because of robotization [3]. These will lead to many careers leading to more advanced technology as it fits with nowadays era.

Students make initial but critical decisions regarding what to study and which career path to pursue. But many students enter post-secondary education without a clear idea of their primary major and future career plans. Sometimes, mismatch of the major choice and lack of information through professional study is one of the reasons for them to change major. Such changes are wasteful in time and resources, and it is the cause of financial and emotional stress for students. Approximately twenty to fifty percent of students enter college with an undecided major, and roughly seventy-five percent change their major at least once before graduation [4]. Before continuing their studies at the university, the appropriate career choice must be made for students so that students do not make mistakes. The common problem is that students have no idea choosing a career relevant to their academic achievement.

The college years are a crucial time in young adults' lives; during that, they make career-related goals and investigate potential career paths. Therefore, choosing a career path and building a career-related identity can become challenging. For example, the amount of career-related possibilities makes it tough to commit to one. Additionally, sure students do not feel ready to make career choices since they lack the requisite information about professions and occupations. To assist the decision, students may engage in career exploration by actively trying to acquire and explore profession-related information. In this way, career exploration constitutes a self-regulatory attitude that may enable the students to select a career route and attain their career goals [5]. So many college students often find it challenging to decide their major and potential career paths. Some struggle even more with career decision-making after completing their bachelor's degrees. Such career indecision can negatively impact the students' personal, social, and professional life [6]. Discovering students' suitable occupations as early as possible can help them choose an appropriate vocational learning direction and build the skills and abilities for future work. Currently, the existing system does not show suitable career options to help students choose a career that suits them. This research aims to develop a system based on mobile applications that can help students choose a suitable career according to their academic achievements before furthering their studies at university. This system can determine careers according to examination marks and co-curricular activities followed in school. In addition, the system will list suitable careers for students who use the system. Next, the system will use rule-based filtering that makes recommendations based on the optional input related to student information. Then, the system will identify appropriate job careers for the selected subjects' approval and co-curricular activities. A career pathfinder will aid in the decision-making for the future job career of the student. It provides a platform that users can interact with applications on the android device, making it user-friendly for the student to decide on a career path through a job career list provided from the information on the students' academic qualifications and curriculum activities. This

research aims to make a mobile application for students to obtain employment career options appropriate to their educational qualifications. By creating more favorable career decisions for students based on their preferences, this system can increase student performance on courses it recommends, thereby contributing to the improvement of the educational system. Conclusion, the system that want to be develop will fulfil the requirement needed to achieve better result in giving career path.

Several studies have been conducted to investigate the issue of career path recommendations, and most are concerned with job recommendations, while only a few are concerned with career path recommendations. For example, Paparrizos et al. trained a machine learning model to predict candidates' next job transition based on their past job histories and the data of both candidates and enterprises on the web [7]. Furthermore, it also includes a practical decision assistance system to aid students with determining positions that have most matched their interests. A real case example is developed with student and career information provided by a university's career services office. The position criteria are retrieved understandably and expressed via reflection on students' interests [8]. Therefore, in the research discovered, there will be the reality that needs to be told so the problem can be shown and then solved.

As a reality right now, students are often asked about a suitable career for their future but have no idea about the available jobs that current industries offer. Furthermore, students searching for university admission frequently face problems selecting courses and educational programs, and they are confronted with various courses to grab. At the same time, their understanding and experience are insufficient to determine which courses might be most appropriate for them. Further, students are probably fascinated with pursuing specific careers after acquiring university degrees. However, they might not be aware of which courses might suit their professional goals and whether or not they have the necessary capabilities to pursue those courses [9]. Therefore, this problem can cause very impactful consequences to the students when making a career decision.

Consequently, some students might have made mistakes in deciding what career path is appropriate. Often, the direction, course, and academic program choice is accomplished based on the present-day based on current trends in the job market, recommendations from own circle of relatives' members, and peer influence. A decision-making mistake at this level could affect the students' careers. Selecting instructional courses and programs before entering university can be critical as it contribute to long-term consequences [9].

Moreover, career selections affect many interrelated issues and have a long-term impact on the individual's career satisfaction, well-being, and standard of living. Individuals need to increase their professional flexibility to adapt to changes in their environment. While many people remain satisfied with their decisions, others regret their decision or consider a career change about the difference in the world of work or their situation [3]. Individuals are often conscious of their career decisions since they affect their well-being and, consequently, their future earnings [2]. Therefore, some applications can help make career decisions easier and avoid consequences.

The research is focused on university student candidates as they have to make critical decisions in selecting a career path they want to follow before entering admission to the university. This research's scope is focused on identifying the relation between jobs career and educational qualifications and curriculum activities, then finding the jobs career suitable for students to decide the best career path for themselves.

This research is also generally built for all students since some will have difficulty choosing fundamental education that is direct to their career path before entering Form 4 in high school. Some school gives a choice about education path; commonly, that school has the highest achievement in a specific field like academics, sports, and extracurricular activities. This research would help the student enhance decision-making about career path before the student attending the admission to the university. This research's scope is for a mobile-based application specifically for the android operating system in the form-factor of mobile devices with portability such as smartphones and tablet computers.

2. Literature Review

2.1. Finding a Job Career for University Student Candidates

Career decision-making becomes a challenging issue today because these are the most important decisions a person makes in a lifetime [2]. When deciding on a career path, the individual will usually

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resolve it independently with internet research, which creates a broad field of available careers. Still, not all are suitable to be part of a career. The student's qualifications must match the profession's requirements to find the right career. To determine the satisfaction in career findings, recommendations, and career advisory will come in the place to help the student make the decision. With these helpers, career decision-making will be much easier, and the student will have more satisfaction and confidence in deciding on the career path to pursue. Thus, this part will discuss this method of finding a career for the student. Figure 1 shows the method of finding the career students can use to find a suitable career.

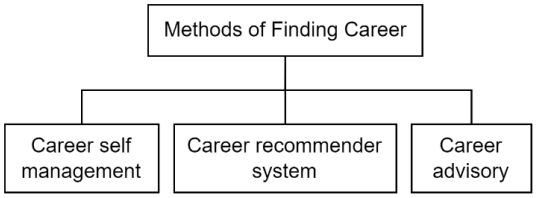

Figure 1. Methods of Finding a Career

- Career Self-Management
  Career self-management involves ensuring individuals have contacts, skills, and experience to achieve desired career results, actively influencing people's decisions that can stop those results, and balancing work and life demands. It provides free choices and vast career opportunities depending on knowledge and skill in finding a suitable career. Career self-management behaviors can influence career success by implementing a career plan [10]. Self-management of the profession can help determine how to be satisfied and fit the job into the long-term. Learning career self-management in these jobs should reveal important information on modern ideas like employability and a variety of work-life [11]. Therefore, career self-management works for an individual to find a career, and the individual must have knowledge, skill, and experience to make it work.
- Career Recommender System
  A career recommender system is an application software based on the computer or mobile device that displays the output of the suitable career from student data input. It creates an interactive way of finding a career because of the user-friendly interface that guides users to use the system. The system has many techniques to process the data information to generate the output. The system implementation is based on a filtering technique that takes user input, processes the data, and then displays possible career paths [12]. By providing the needed information from the student, the system can list out the recommended career that is appropriate. The system offers the recommended career for the student to choose the proper career selection based on their strengths, skills, and personalities [13]. This system creates an opportunity for the student to get an idea of a career they can follow.
- Career Advisory
  Career advisory is a process that will help students know and understand themselves and the world of work to make career, educational, and life decisions. Career advisory works as the interaction between two people: advisor and student. The career advisor must research career needs and services to provide appropriate career services [14]. As the advisor interviews the student by asking the question, the student needs to answer all those questions with truth to get the appropriate result from this process. Career advisors help students make the best career decision and ensure success. An academic advisor can help the student find the right major and consider how it connects to a possible career path.

2.2. Main Types of Recommendation System

Recommender systems are specific information filtering systems that deliver items from an extensive collection that the user will likely find interesting or valuable. There are two main types of recommender systems – personalized and non-personalized. A personalized recommendation system

analyses users' data in more detail. In that way, every user will get customized recommendations. The most popular types of personalized recommendation systems are rule-based, content-based and collaborative filtering. Non-personalized recommendation systems like popularity-based recommenders recommend the most popular items to the users, for instance, top-10 and the most frequently purchased product. This segment will discuss several recommendation techniques based on Figure 2.

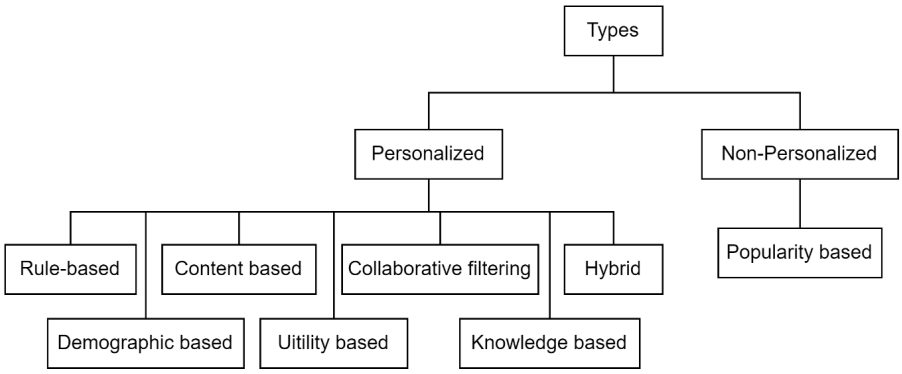

Figure 2. Types of Recommendation System

2.2.1. Personalized

The personalized recommendation ranks many items based on how the user likes to use them. The personalized recommendation considers how the user has rated and predicted things in the past. Personalized decision support focuses on a small amount of information while optimizing a set of objective functions that may conflict with each other. Accurate and effective item ranking makes it possible to create personalized search results, marketing strategies, suggestions for e-commerce production, and entertainment content. Personalized recommendations can be used in many ways, and each needs a different set of algorithms and hardware systems to work well and responsibly. Personalize recommendation has techniques that can be used to process the data in various ways as the information provided. Figure 3 shows several techniques for personalized recommendations.

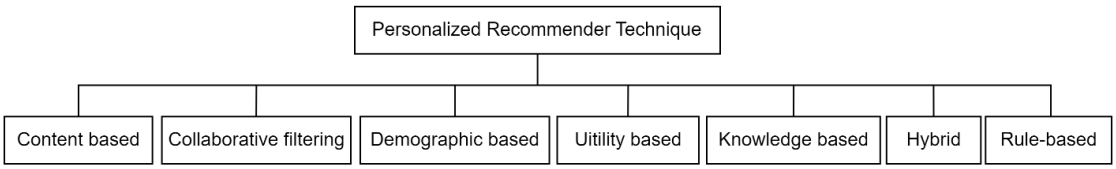

Figure 3. Personalize Recommender Technique

- Content-based
  The content-based approach depends on features like the user profile and item description. It utilizes information related to the items and users. Content-based filtering algorithms attempt to recommend items based on the number of similarities between them by taking the dataset then run through if-else algorithm, if the condition right then it will display the right items. Content-based recommendations have an advantage when they use topics as their main features. Some infrequent words may not seem to belong in a job recommendation, but they may be linked to frequently-used words that indicate strong characteristics [15]. Content-based filtering seeks a match between the content of the items and a user's profile. Each item's content is presented as a list of words or phrases, preferably from a report. This technique has the potential to adjust its recommendations within a short time. This technique is easily scalable because it utilizes a small amount of data. In addition, unlike other techniques, this

one does not need to compare the user's data to another user's data, allowing it to provide results best suited to the user's specific profile.

- Collaborative Filtering
  Collaborative filtering is evaluating or filtering items based on the result of multiple users' data with similar preferences to the target user. It makes recommendations to the active user using information about a set of users and their relation with the items. In similarity models, collaborative filtering techniques collect and establish profiles and determine the relationships among data. User preferences, behavior patterns, and item properties are some of the possible categories of data used in this technique [16]. Collaborative filtering is a method for filtering the items that a user may like based on the reactions of other users. It works by browsing through a large population to identify a small proportion of users who share a user's interests.
- Demographic-based
  The demographic-based system classifies users according to their attributes and makes recommendations based on demographic groups. Use demographic information such as age, gender, education, etc., of people to identify types of users. Demographic-based recommender systems make suggestions based on what they already know about the user's background and what they think about the suggested items. The data input phase collects demographic and user ratings. Based on user ratings, these partitions calculate user similarity, and similarity computation divides users into groups with similar demographics. Demographic systems are stereotypes as it expects all users in the demographic group to have the same preferences. This approach does not require a history of user rating, thus making it quick, easy, and simple for the result based on several conclusions.
- Utility-based
  Utility-based recommender systems construct a multi-attribute utility function for the user and recommend the item with the highest utility for the user. A utility-based recommender system makes suggestions based on the computation of the utility of each object for the user. Utility-based recommender techniques obtain a multi-attribute utility function from the item ratings users provide to describe their preferences and then use this function to calculate item utility for the user [17]. This recommender system is commonly used in industries requiring user-specific utility functions and item evaluation to create an inventory system. Utility-based recommender systems can organize non-product attributes, such as vendor reliability and product availability, into utility computations that display the item's real-time inventory system to the users.
- Knowledge-based
  Knowledge-based recommender systems recommend items based on comprehensive knowledge of the domain, item attributes, user specification, and recommendation criteria. Knowledge-based recommender systems help recommend infrequently purchased items. Moreover, users are typically more explicit about what they want regarding domains for these items. A user may accept a recommendation on a general basis without much information but would not accept a recommendation for a high-priced item without knowing more about its specific features. In knowledge-based systems, the user controls how recommendations are generated because a complex problem domain requires detailed requirements. In contrast to other recommender systems, they do not rely on large quantities of statistical information about particular items or users. It only needs sufficient knowledge to judge items as similar.
- Hybrid
  Hybrid filtering is a method of filtering that employs multiple techniques. The hybrid filtering strategy was developed to address issues with other filtering methods, including the cold start problem, the over-specialization problem, and the sparsity problem. The cold start problem is that the recommenders can't make assumptions about users or items for which they don't have enough data [18]. Overspecialisation occurs when users can only receive recommendations for items similar to what they have already specified in their profiles. Data sparsity problem occurs due to insufficient information. Hybrid filtering is also used to improve the precision and speed of the recommendation process. Utilizing multiple recommendation techniques can reduce the downsides of a single technique within a combined model.
- Rule-based
  Rule-based recommendations are a type of recommendation that classifies datasets based on a

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set of "IF...THEN..." rules. The IF clause of a rule is referred to as the rule of an event or cause coming before something happening or precondition. It consists of a combination of characteristics. THEN represents the rule's consequence. This section represents classification results that are either positive or negative. If the characteristics of a dataset (d) meet the requirements of a rule (r), rule is said that d is covered by Isinkaye [19]. Constructing a comprehensive rule-based recommendation attribute is difficult because it requires a substantial amount of background knowledge. Best practice of this method is to validate the problem, validate the data, decide on a “one-by-one” or final decision approach, create informed rules and write a code and iterate on the results. By follow the right method this recommendation system can give proper result.

2.2.2. Non-Personalized

The most straightforward recommender system doesn't consider the user's preferences are not personalized recommender. Each user gets the same suggestions from these systems. As the name suggests, these recommender systems don't consider what each user likes.

Popularity-based provides a useful non-personalized recommendation, as most of the system that uses this method is online shopping websites. This recommendation may not be necessarily specific to the user but to what the user is currently doing, viewing, and buying. The basic idea for this system is that people who did some X also did Y. The simple computation can be the percentage of X-buyers who also bought Y. The advantage of this method is that it is easier to implement, and data is easy to collect. As for disadvantages, this method lacks personalization and does not appeal to everyone. This technique provides a general recommendation to all users and is not sensitive to the interests of specific users.

2.3. Components of Recommendation System

These five components can be developed simultaneously or sequentially, allowing development to meet the research's requirements. Developers frequently desire to focus on specific aspects more than others in real life. Once essential components are in place, developers devote more time to ensure that data collection and processing are carried out effectively and quickly implement the recommender post-processing phase.

1. Data Collection
   The core functions of this component depend a lot on the use case, but it's common for it to have some steps for cleaning and normalizing data and some ways to create and choose features. Since the recommender model depends on these data, the quality of the suggestions it makes is limited by the quality of the data when it starts. Recommendations are often made incorrect input will produce faulty output in systems, so it's essential to develop an effective way to collect and process data.
2. Recommender Model
   The recommender model, which makes user suggestions, is the most critical part. Its job is to use information like user preferences and descriptions of items that can be suggested to predict which items will be interesting to a particular group of users.
3. Post-Processing
   Most of the time, the recommender model's suggestions require post-processing before being displayed to users. It is typical for some recommendations to be removed and the rankings to be altered at this stage. This section is typically responsible for protecting the person's reputation who provided the recommendation. It may use some business logic, such as not recommending certain types of items to certain users or attempting to diversify the recommendations so that users have more options. Depending on the system's needs, post-processing can be done in batch mode (offline), real-time mode (online), or a combination of the two.
4. Online Module
   After the recommendations have been post-processed, many online modules serve them and monitor their utilization. Typically, this is where you'll find the capability to conduct online testing of different methods for making recommendations. Here is where you'll decide what needs to be kept in your logs to report your system's performance and learn how it is used and how people interact with it.

5. User Interface
   After making suggestions, a method for displaying the system to users must be created as the user interface. The user interface component informs the recommender of what the user sees and how they can interact with the interface. It should not come as a surprise that a recommender system's interface significantly impacts its usefulness. It is advisable to give users instructions on using the system and its features.

3. Methodology

3.1. Development Process

Mobile Application Development Life Cycle (MADLC) used in development process for mobile devices. Although MADLC is similar to Software Development Life Cycle (SDLC), it also presents some additional requirements for which traditional SDLC must be customized to get MADLC (K. Flora et al., 2014). Based on Figure 4, four phases of research methodology used in this research are part of the MADLC.

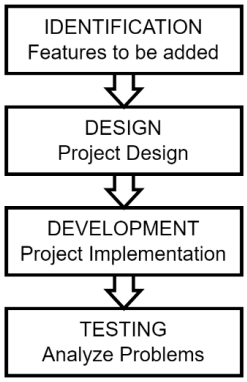

Figure 4. Mobile Application Development Life Cycle

Mobile Application Development Life Cycle consists of four phases:

1. Identification Phase: Planning in the feature wants to be added.
2. Design Phase: Design the structure of the system.
3. Development Phase: Implementation of the software and tweaking.
4. Testing Phase: Test the system whether the system runs accordingly to expectation.

The first phase is the identification phase, which is planning the system feature and checking every aspect of the requirement, then methodology for gathering data, developing model, identifying algorithms, platforms, and software. After that, this research will describe the design structure of the system. The development phase then involves implementing the system component, including software, integration, and database. Finally, the testing phase will outline the operation strategy to detect faulty during operation.

- Identification Phase
  The first stage of the MADLC model was identification. This phase will deal with functional and non-functional aspects of the application. In this phase, ideas are collected and categorized. This phase's main objective is to identify the system requirement in academic qualification and extracurricular activities as user input relevant to the career criteria. To accomplish this objective, research must be conducted by collecting data from research and identifying the matching requirements that can make suitable courses in relation to examination results. It is essential to make user input related to a career as it has to match each other to get the result. The identification included gathering information and analyzing the data. It explains the additional feature to be added in the phase. It studied the current research or similar system and gathered the necessary information during this stage. The required information is accessed and collected, and the documentation will be created to help the development process. The software that is required to develop this research is

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defined. Figure 5show the identification phase.

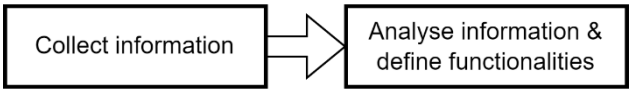


Figure 5. Identification Phase

- Design Phase
  The research structure's idea is developed into the application's initial design in the design phase. This phase's main objective is to design the system architecture that meet research requirement. The feasibility of developing the application on all mobile platforms is determined. Alternatively, the specific target of the mobile platform is identified, and the functional requirements are defined. The system architecture of the application is created, and then the system is defined. An essential part of the design phase is to make the storyboard for the user interface interaction: this storyboard describes the flow of the application. Figure 6 show the design phase.

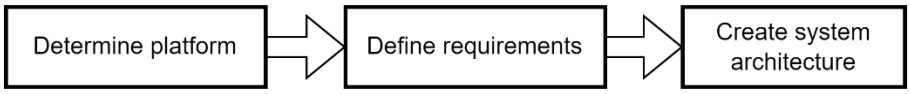


Figure 6. Design Phase

- Development Phase
  In the development phase, the application is coded, and coding for different system modules can proceed. This phase's main objective is to develop a mobile application that uses rule-based filtering to find a suitable career. To accomplish this objective the rule-based filtering is used to create the processing data. The process of rule-based filtering starting from all required data in dataset. The input from user will be taken to if-else algorithm to make a matching meet a condition of if statement. If user input matching with line of data inside dataset that input will be filter inside of the if-else algorithm. It is essential to get the platform and technique used in the system as this part of the development process. The development process is implemented by creating necessary coding for the recommender system's core functionalities and every essential functionality such as user interface, medium communication, and database. These modules integrate into one system structure, so every module is connected. Next, the user interface is designed to be supported on many mobile operating system platforms. The minimum interface components in the android mobile platform would be used in the design. Figure 7 show the development phase.

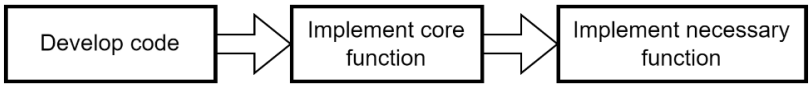


Figure 7. Development Phase

- Testing Phase
  The testing phase is crucial to recognize errors and ensure the system runs according to the expected plan. This phase's main objective is to test the application functionality in finding a suitable career. It is essential to know the objective to test the application to help identify the requirement in testing. The testing of the system is performed on an emulator or simulator, followed by testing on the actual device. The testing on the real device, in the case of android operating system development, will be performed on multiple operating system

versions and models of mobile phones with variable screen sizes. To test the functionality, every function such as account registration, login and career finder is tested either it works and meet the required action that demanded. Figure 8 show the testing phase.

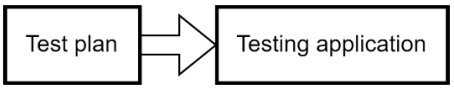


Figure 8. Testing Phase

3.2. System Architecture

A system architecture is a conceptual model that defines the structure, behavior, and views of a system. Figure 9 shows the architecture of the recommender system.

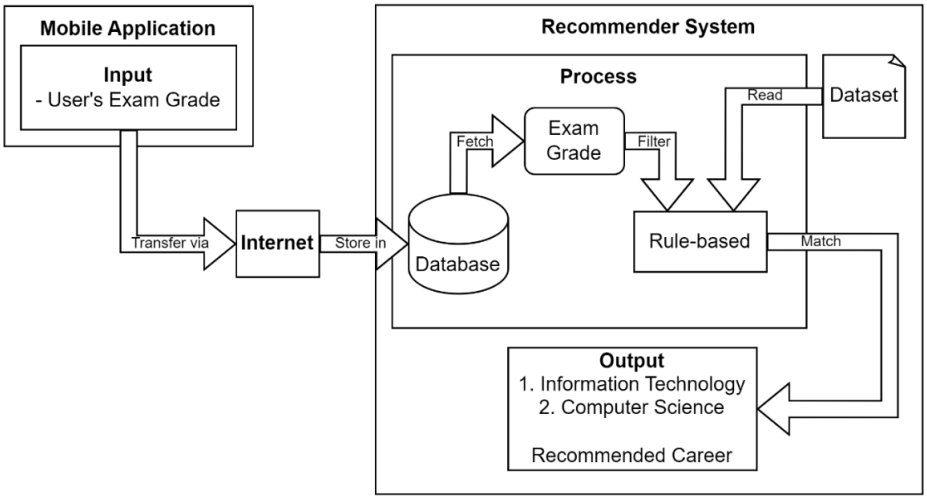


Figure 9. System Architecture

Figure 9 includes the software elements that enable the system's design structure. This system architecture will have three components: input, process, and output. The minor component is the communication medium which is the internet. In the input component, data sources from the user will be used. The user provides data input, which is fundamental for the system. The input data needs to collect from the user are grading from academic results. The rule-based filtering of the if-else method will expect these element from the input data to match the dataset's career requirement to provide the user with a suitable output. There will be the medium of communication which is the internet that connects the mobile application to the recommendation system and stores the input data in the database.

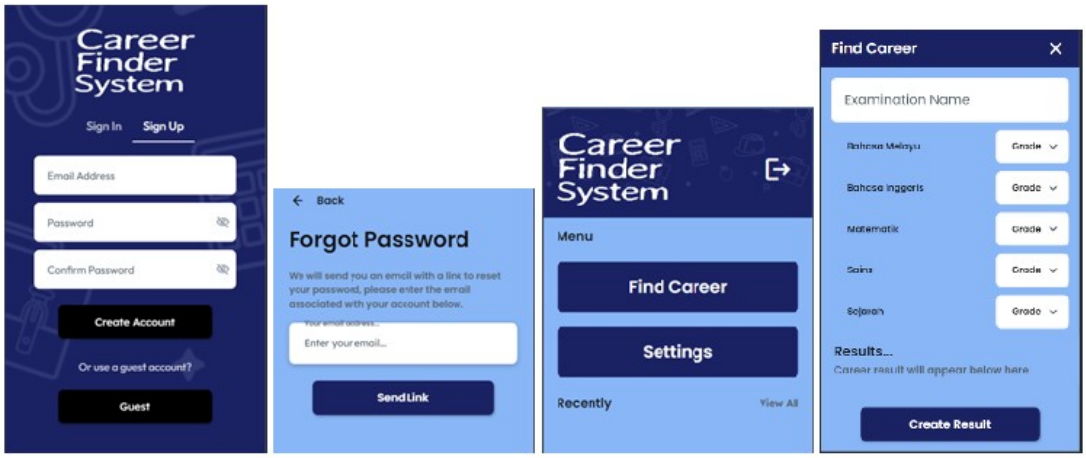
The recommender system consists of process and output. In the process, the system will fetch the data from the database: grades and curriculum activity. Then the system will read the dataset provided, which is a career qualification dataset. These two elements from the input in the database will merge with the dataset and then go to output as the result of the filtered data. The output will show a list of suitable careers.

There will be three algorithms in the recommender system that will be performed. First, the system will fetch the data input and read the dataset. Second, the data input will be filtered by comparing the similarities from the dataset in the filtering process. Lastly, the system will assign data into an array by making the loop, so the data input will compare every time with the dataset to create the output list of recommended careers.

4. Finding and Discussion

4.1. Interface Design

The interface design shows the picture of the basic interface inside of this application. It can give basic idea of what the application looks and works.



A B C D

Figure 10. Interface Design for Career Finder System

All the pages contain:

1) Login Page
   This login page allow user to login and register the account into the application, or user can just enter the application by using guest mode for quick access. Figure 10A shows Login Page.
2) Forgot Password Page
   This page allow user to reset the password of the account, if user happen to forget the password of the account. Figure 10B shows the Forgot Password Page.
3) Home Page
   This home page allow user to navigate through the application by providing the essential function of the application. At top right corner has function to log out the account and proceed to login page. Figure 10C shows Home Page Interface.
4) Find Career Page
   The user should select the selection of the grade based on the examination subject respectively. The user should click the Create Result button to proceed to see the result of the career path. Figure 10D shows Find Career Page.
5) Career Path Result Page
   The result page displays the result of the career path that has been recommended based on user input on previous page of find career page. Figure 11 depicts the result of the career path based on examination grade.
6) Settings Page
   The settings page provides the application to show notification on the mobile devices.

4.2. Functionality Testing

The functionality testing was conducted to test all the functionalities of Career Finder System as stated in design. Table 1 shows the result of functional testing of the mobile application.

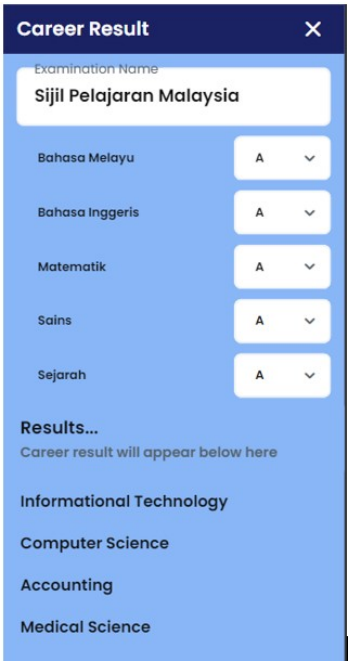


Figure 11. Result of the Career Path Based On Examination Grade

Table 1. Functionality Testing Result

No	Module	Processes	Expected Functions	Test Result
1	Login Page	On first launch the system this page will appear.	Provide option to sign in or sign up to application.	✓
2	Sign In	Input email and password will authenticate the user if the existing users available in database, else the system will prompt user not available.	Sign in as existing user.	✓
3	Sign Up	The input will register new user into database.	Sign up as new user.	✓
4	Home Page	This page will appear after successfully sign in.	Provide selection menu to navigate to “Find Career”, “Settings” and “Logout”.	✓
5	Find Career Page	The input of subject grade will compare to dataset available with the if-else algorithm that give the condition either input meet the dataset requirement.	Provide user multiple selection of grade on every subject then matching input inside of if-else statement algorithm from dataset.	✓
6	Result Page	The output of the dataset will appear here with the input from earlier page.	Provide the result.	✓
7	Settings Page	This accesses from homepage to change the setting of the application	Provide optional settings.	✓
8	Forgot Password Page	The page will ask user to input email that password had forgotten, then the system will send the email to the user to do the password reset.	Provide user options to reset password of existing account.	✓
9	Logout	Logout function that logout the account and redirect user to login page.	Logout the account.	✓

5. Conclusion

There are many services that provide user access to find suitable career but most of it does not provide the system build for mobile devices and does not take examination result as alternative aspect to find the suitable career. Therefore, this application can help student to find suitable career anytime and anywhere even offline situation with no connection available. The limitation of this research is that career path related to the examination result requirement may missed some relevant papers since there is lack of research that conducted has been conduct on suitable career path based on examination result. So, recommendation result may not be accurate to some person. Besides that, the system cannot give full details on career path based on examination result as many aspects should be taken to recommend the career path such as personality and current job market. In future study, this system will involve multiple aspect rather than just from examination result. These include personality test and career quiz. The ideas given by many aspects of information on a person can specify the best suitable career. Furthermore, useful feature such as examination result analysis can keep track what subject can be focused to improve it and interactive details of the result that can redirect user to proper informational website to make the application more user friendly. The suggestion that has been made about career finder system were intended to help research development in the future.

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