IIUM Freelance: Secure Payment Transaction by Service Progress via Mobile Application

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Abstract— **Freelancing entails individuals offering their services to clients or businesses on a contractual basis, rather than being employed by a single employer. Freelancers typically work remotely and may serve multiple clients simultaneously. However, there's often a lack of digital platforms to promote skills and meet consumer demands, leading to challenges in offering the qualified services for the clients and demand supply matching task. To address these issues, the IIUM Freelance platform was developed to cater to both clients and consumers satisfaction. The objectives of this application include designing an e-commerce-like platform to simplify the process of finding suitable talent or offering the talents to the market. The design includes the secure payment transaction process by monitoring the progress of the task. Rapid Application Development (RAD) was chosen as the methodology due to its flexibility and quick iteration capabilities, making it faster and more convenient to resolve issues during the development process. Through research and testing, the IIUM Freelance Platform was successfully built using the Dart language under the Flutter. Therefore, the development of the IIUM Freelance is crucial and useful towards the increasing of employment rate and security of the payment transaction decision since the release payment depends on the task monitoring.**

Keywords- Freelance, Rapid Application Development (RAD), Dart, Flutter, Firebase, Mobile-based Application

I. INTRODUCTION

As we all know, many people have been doing part-time work as a way to gain extra money to survive long-term impact especially after pandemic. Pandemic that hit us recently had a huge impact on the economy, causing a ton of people to lose their jobs. As a solution, Service-as-a-Product or "SaaP" model has been created to gives an opportunity to clients who have the skills and capability to become freelancers. SaaP is a service production and delivery paradigm in which a seller or vendor sells a productized service to a customer and the service is centrally hosted. Moreover, IIUM Freelance Platform provides an e-commerce-like experience that makes it easier for consumers to find suitable talent for any required services in safety mode. The developed platform offers not only virtual services such as graphics design and programming services, but also physical tasks such as cleaning and runner services.

IIUM Freelance Platform is created to solve problems for both the consumer and the clients which is the freelancer where the problems occurred in finding a new jobs and lack of digital secured platform to advertise the expertise. Whereas for the consumers, spend too much time on filtering suitable talent for the particular task demand. and always having trouble to gain good references and trust from the freelancers. By identifying the problems, the goals for this project have been made and this project is realized to achieve a specific goal where the objectives are to design an e-commerce like application to give an easier and satisfaction experience to both categories of users, develop a mobile-based application to make it easier and safe to access by both clients and consumers and last but not least to analyze and study the efficiency of this application.

The paper comprises four sections delineating the related work from previous studies, presenting a comprehensive methodology for developing the mobile application, followed by results and discussions where design, implementation, and feedback are synthesized. The final section encompasses conclusions and future work, summarizing limitations and discussing opportunities for future research and development.

II. RELATED WORKS

Self-employment fills gaps in existing or new business systems and procedures where medium and big enterprises are ineffective and unable to generate a proposal that meets a consumer's needs in terms of quality, price, and other factors. The future of the burgeoning "freelance economy" is depicted in a paper by the Roosevelt Institute and the Kauffman Foundation, which forecasts that by 2040, freelancing will have a prominent influence on labor markets and will have displaced traditional forms of work [1]. Based on the research that has been made, the mobile marketplace's rapid expansion provides customers with a plethora of options for shopping on the go. The digital experience and mobile browsing, and how they relate to mobile commerce, are, nonetheless, little understood. The digital experience and browsing behavior of online retailer apps explain purchases, but the mobile experience and browsing behavior of conventional retailer

apps are more essential for traditional retailers [2]. Every e-commerce site provides information about the shop and its items. It aids in the purchase and sale of goods. Some are for personal gain, while others are for professional gain. The study also included a look at the items from the perspective of the customers, as well as a cost and description of the products. Connecting and developing the application necessitates the use of various software development approaches. For the apps to respond and perform in a stable manner, the frontend and backend applications are connected [3]. E-commerce sales activities have emerged as a new option for both sellers and consumers, since this approach allows for purchase transactions to be completed from any location. The payment is made using a provisioning mechanism, such as an ATM or e-banking transfer although there was a study that has been made that suggest the payment made using cryptocurrency but there is a drawback where any activity that modifies the state of the cryptocurrency consumes gas, which the user must compensate for. Meaning that some of the actions that are being performed in the application are not free. With e-commerce as one of the most powerful sales channels for reaching the target demographic of tech-savvy young people [4]- [5]. Even so, there is also a study that shows the weakness of online marketplaces where the services do not satisfy the customers and it takes a long time to attract the customers [6]. To increase the efficiency of the application, we may use a chatbot where it can respond towards the customer's question 24 hours without having someone to manually answer the question but the downside of using this chatbot is it may not respond as intended when the customer input a not recognizable question [7]. In conclusion, even though freelance applications can generate income and boost the economy, there is also an issue found in the study where freelancers need to do a lot of freelance activities to be added in their portfolio before they can truly be trusted and be chosen by the customers [8]. Not only that, but the existing platforms for freelancer also lacked the validity of freelancer and the platform is very complicated and required a lot of documents upload and proof of work [3]- [9].

Matthew et. al. proposed mobile application, Artmoon, offers various features including a portfolio promotion page, reminder/time management functionality, and a progress tracker. These features are designed to enhance freelancer productivity and improve client-freelancer interactions. However, the paper could benefit from providing more detailed information about the methodology, such as specifying the design thinking steps followed and detailing the sample size and selection process for the qualitative research. addresses a pertinent issue and proposes a promising solution, there is room for improvement in terms of providing clearer methodology details and elaborating on the features of the mobile application. Additionally, expanding on the conclusion to summarize key findings and discuss potential challenges and future research directions would strengthen the paper's overall impact [10].

III. METHODOLOGY

IIUM Freelance platform focuses on solving the user's challenges, so there are a lot of interaction between the users and the developer during the development processes. Rapid Application Development (RAD) has been chosen as the methodology because the time frame is likewise quite limited. The RAD model focuses on quick prototyping to gather feedback from the users. There are five phases that is required to be followed through the development process portrayed in Figure 1. The five phases are defining project requirements, prototype development, users feedback collection, system testing and system implementation. RAD has been chosen because of the advantages that it offers due to its flexibility as the developer can make changes quickly during the development process and the quick iteration reduces the development time to a shorter period as well as the ability to increase users' satisfaction due to high engagement with the developer.
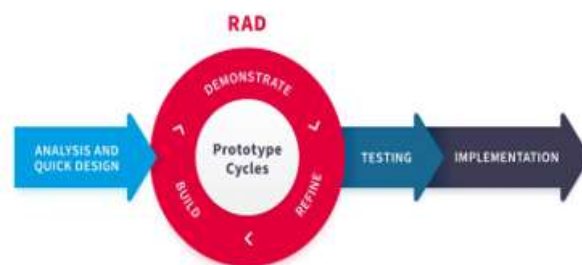

Figure 1. Rapid Application Development Phases

3.1. Requirement and Specification

The first step before prototype development, the requirements of the project such as the number of modules, interfaces, the equipment required and the timeline of the project need to be declared. After clearly defining the requirements, then the project's journey will be smoother. As for this project, client and the consumers has been interviewed to sort out the problem that is plaguing them. After that, research has been made to find out the feasibility of this project.

3.2 Prototype Development

Succeeding having the requirement and specification move to the next phase which is prototyping where the actual development took places. RAD model has been chosen to create a prototype that has the core functions to present it to the users. Feedback can be gained as quickly as possible and do necessary refinement to the product. The project was also developed each week and users were shown how the system works. The received feedback then will use to refine the system.

3.3 User Feedback Gathering and Refining

Postliminary having the prototype with core function, it will be release to the users to be test and the feedback is shared to the developer. The feedback received will be use by the developer to further improve the system. These two phases which is prototyping and gather users feedback will be repeated until the users is satisfied with the system.

3.4 Testing

Before the application will be release to the users, testing is needed to avoid problems. Testing is the process of inspection, conversion, and further refinement, IIUM Freelance platform application ensures that this system is useful and convenient for users. In this phase, this system will be tested in terms of its function so that it can function as planned. If there is an error and it cannot be carried out as planned, it will be maintained in this phase.

3.5 Implementation

Final stage is where development begins. Starting with writing drafts and programming according to the design that has been acquired. The program is made one by one involving all the sites and links to the database to complete the system. Testing of this system is done in stages where each module is tested. Each subsystem tested will be integrated into one complete system. Testing has been done to determine the performance of the system.

IV.   RESULT AND DISCUSSION

Entity Relationship Diagram (ERD) for the system had successfully designed as shown in Figure 2. After defining ERD, we had successfully designed the Context Diagram (CD). Based on Figure 3, There are two main users which are clients and consumer. The clients and consumer can login to the system by entering username and password. The clients also can register their ads by entering the ads detail in the system. As for the consumer, they can make purchases by selecting the ads that are in the system. After consumer has made a purchase, the purchase details will appear in both of the user's dashboard.
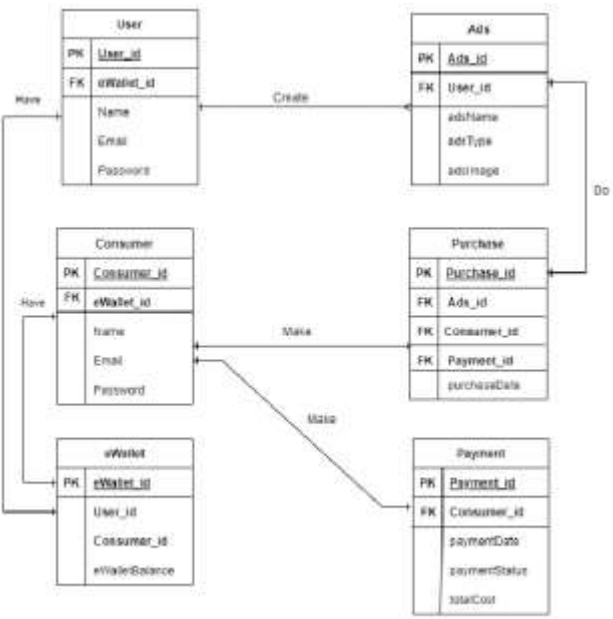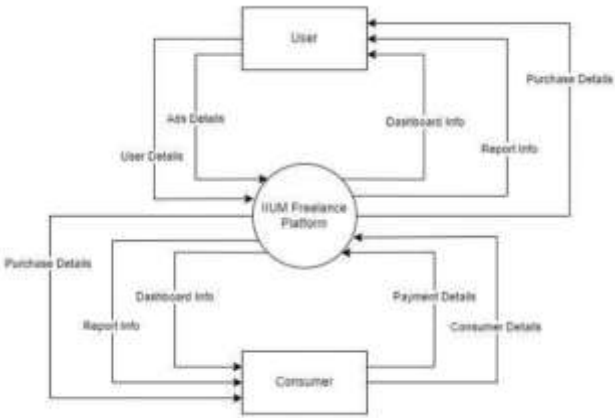

Figure 2. Entity Relationship Diagram

Figure 3. Context Diagram

Last step for requirements and specification is to design the Data Flow Diagram (DFD). By having both ERD and CD, we had designed the data flow diagram to show the flow of the application. Based on Figure 4, client and consumer can sign up and login the system. As for the client, after they have created the ads, they can update and delete their ads according to their preference. Finally, consumers can make purchase and make payment if they interested with any of the client's services.

On the second phase of RAD model which is prototype development, the first user interface as depicted in Figure 5 has been created with its core function which is sign up and log in process and has been tested with test values to check the functionality. The first prototype is using SQLite where the database is integrated within the application.
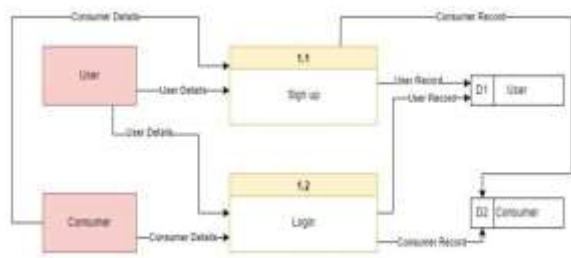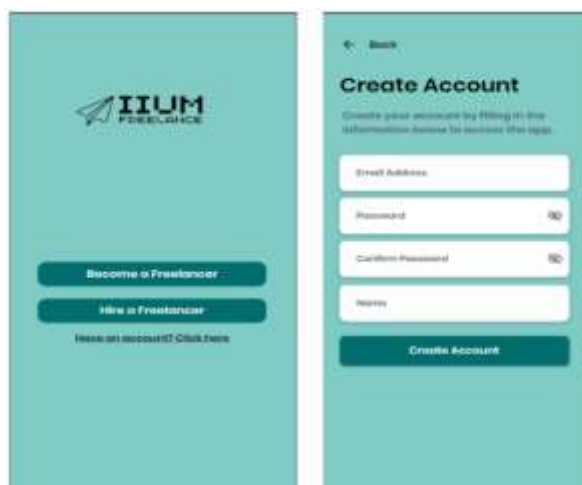
Figure 4. Data Flow Diagram

Figure 5. Prototype User Interface

Succeeding having the prototype, inspection, conversion, and more refining have started. For this system to work as intended, its functionality has been tested. It will be maintained if there is a mistake, and it cannot be done as intended. A few testing on the core function have been made and the test case has been recorded in Table 1 and 2.

Table 1. Test case for Login

Step	Procedure	Expected Result	Pass/Fail
1	Go to login page	Login page loaded	Pass
2	Enter email and password Email: xyz@gmail.com Password: 12345678		
3	Click login button	Login Success	Pass

Finally, the system development of final user interfaces has been made as depicted in the Figure 6,7 and 8 and based on the prototype. We decided to change the database to Firebase

because of its better functionality when handling real time data from the users. By completing the full development, we had tested every function within the application to avoid future problems and every test case has been recorded in Table 2.

Table 2. Test case for

Step	Procedure	Expected Result	Pass/Fail
1	Go to register page	Register page loaded	Pass
2	Enter full name, email, password, Phone number, address and account type Full Name: Abdul Email: xyz@gmail.com Password: 123 Phone Number: 019348830 Address: Mahallah Ali Account Type; Freelancer		
3	Click register button	Register Success	Pass

Figure 6. Register/Login User Interface

Figure 7. Home/Order List User Interface
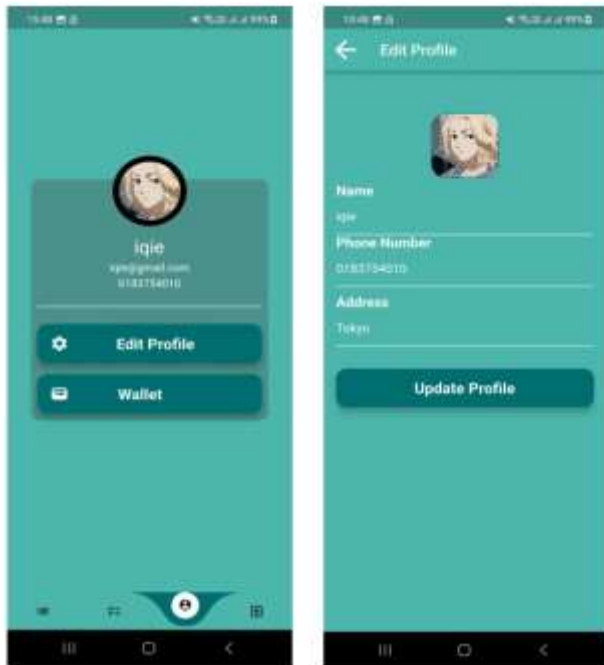
Figure 8. Profile User Interface

Table 3. Full test case

Test case name	Procedure	Expected Result	Pass/Fail
Register	Go to register page Fill in details Click register button	Register success	Pass
User Login		Login success	Pass

	Go to login page Fill in details Click login button		
Update account	Go to profile page Click edit profile button Fill in details Click save button	Edit profile success	Pass
Reload E-Wallet	Go to profile page Click reload E-wallet button Fill in the details Click reload button	Reload E-Wallet Success	Pass
Upload new ads	Go to upload ads page Fill in the details Click Upload button	Upload ads success	Pass

Based on Table 3, the app is working perfectly fine without any bugs and the implementation went smoothly without problem. During this phase, we discovered some parts that will be worthwhile to improve on.

V. CONCLUSION AND FUTURE WORKS

To summarize, this project has been completed and fits all objectives. There are two types of users which are client and consumers. Both type of users can register and log in within the same system. The client can view the list of ads that has been added while the consumer can view all the list of ads that has been added by all of the client and monitoring the service progress upon the agreement.

5.1 Constraint and Limitation

This project is executed by two developers and both developers were in different countries. This remote working in the development of the project was a huge constraint which slowed down the progress of the project. One of the most common occurrences happened when the same codes were working fine in one of the developer's computers while it was showing error in the other computer when the codes were sent. It took hours, sometimes days to debug and solve the problem.

5.2 Future Works

There is no limit of betterment. Our planning for the future is to develop the web apps and keep testing the apps so that more features can be added. Furthermore, in future,

implementing a chat box system for the consumer and clients to get connected more easily.

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