

# **DEVELOPMENT OF MOBILE APPLICATION FOR FURNITURE E-COMMERCE WITH 3D MODEL: EZ FURNITURE**

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## **ABSTRACT**

The furniture search app is a state-of-the-art mobile application that is widely used in the tourism industry sector. This application provides convenience to all users who need furniture e-commerce services. The objective of this study is to produce a furniture search application as well as provide furniture e-commerce facilities to users. In addition, this application becomes a marketing platform for all furniture owners. Some issues prompted the development of an application design with AR technology. Now, society is catching up with their careers. They have no time to visit furniture stores to buy furniture for their homes, shops, and offices. Customers can not be satisfied with the decoration of their room without referring to the imaginary picture provided. Printed furniture catalogs are paper information with lots of text and images that do not provide any interaction for users. And people can't see more visualized graphics because the original design is presented statically on paper. The solution method is to develop a specific application for general access that is more interactive, dynamic, and user-friendly that can provide and collect all user information and data in a more organized manner. Application development is using the mobile programming language that is android studio and firebase by using a repetitive model approach.

## **1 INTRODUCTION**

Many sectors are now using AR for projects such as the use of visual asset management software in the oil and gas sector. Projects like this are happening across all industries from banking and financial services to retail and to digital health, care, and manufacturing. For example, if you're operating heavy machinery, you can get a real-time view of which components need replacing. But the simplest application is that it can be used to help design rooms.

Augmented reality in interior design is remarkably useful as well, as evidenced by the apps emerging from major home furnishing, hardware, and interior design retailers like IKEA and

Lowes. Augmented reality could be particularly useful for marketing and sales of furniture as it can really visualize how developed projects are.

## **2 PROBLEM STATEMENT**

People don't always feel the need to visit a prospective purchase. One in five property purchases in 2018 was made on a property-unseen basis, according to research by Statista (iflexion, 2020). People have no time to go to various stores to buy furniture for their homes, shop, or office. It is also difficult to take it out and try it at home. If we found out that the furniture is not suitable for the house, then the furniture needs to return to the furniture shop. Even if they have time to go to the furniture shop, after a visit to the shop, people may find that there is none of the furniture that fulfills requirements. Hence there should be a way to let people use their mobile to view a 3D interior design in any way and any time before the real items.

Next, it is difficult to fulfill the customer's contentment of decorating the room without an idea of how the room would look and will make them confused. And it is so hard to choose the sofa that is suitable for the house at the furniture shop. Normally, people will ask the opinion or suggestion from the staff of the furniture shop when they can't decide which furniture suits the house. Hence, the staff of the furniture shop will recommend some of the furniture that may be suitable. For the reason that there are limited spaces, not all the furniture is displayed in the furniture shop. Thus, the staff of the furniture shop may use words to express the design of the furniture that is not on display in the shop. It's hard to explain in words, customers normally do not get a good picture of the design of the furniture because they discuss without a visual aid.

## **3 OBJECTIVE**

There are several research objectives for this application development project. Among them is to create applications that bring benefits to users in dealing with furniture with 3D furniture through android mobile applications. In addition, ensure that this application becomes a platform to promote furniture by displaying pictures and interesting information about each piece of furniture. Finally, it can improve the existing application system by putting some special functions to make it easier for users to use the application.

## **4 METHOD**

It is believed that the Agile System Development Life Cycle (Agile SDLC) methodology is the perfect methodology for the development of this app. In Agile software development, we apply an iterative approach to software delivery. Working software is delivered as quickly as possible, rather than in large batches. Frequent deployment of code allows us to practice Agile to quickly

receive feedback from clients and use it to influence our upcoming work. This also allows us to incorporate changing requirements, even late in the development process.

#### **4.1 Analysis Phase**

This phase is the phase where all data collection for the purpose of mobile application development will be done. The purpose of this data collection is to find ideas and inspiration regarding projects that want to be developed from various sources. For example, reading authentic articles and journals through internet access to get information related to existing mobile presence concepts and applications. All information collected in this phase is for quality purposes and a basis before proceeding to the next phase.

#### **4.2 Design Phase**

This phase is important to ensure that all designs from the problems that have been analyzed previously are relevant to the user. For diagrams or production of models from this phase such as flow charts, conceptual models, and use case diagrams, Visual Paradigm software will be used. Physical sketches of the interface will also be produced so that all the goals analyzed will have a place in the hearts of users.

#### **4.3 Development Phase**

During this phase, Android Studio software will be used to develop on smartphones and the main programming language to be used is Java. The EZ Furniture Mobile Application is divided into two main functions, namely recording attendance and leave applications, where both of these functions have their own complexity. In addition, several other side functions such as leave application status, updating the school calendar, and personal information of teachers will be developed to achieve the objectives successfully.

#### **4.4 Implementation Phase**

The implementation phase begins after all the processes in the development phase are fully completed. This is the phase where the application developer will show how to use the user after the application is developed. Through this phase as well, this mobile application will be tested whether it works well or not while operating. All feedback or comments from users during this phase will be taken for improvement purposes.

#### **4.5 Assessment Phase**

Through this phase, the evaluation and testing process will be done to ensure that all objectives to develop this project are achieved before it is delivered to the end-user. If the user is still not satisfied with this application, then the iteration process will be performed.

## 5 RESULT

The results of the study discuss the results developed from the EZ Furniture application development process. The development of this EZ Furniture application is by using a firebase database to store the data of customers and furniture owners as well as android studio software that involves the programming process and interface design of this application. Firebase database is one of the very important elements that can provide convenience directly to the creator of the application. Firebase is one of the database support that has been developed by the company Google. In the process of developing this EZ Furniture application, there are several Firebase elements used, namely Firebase Authentication, Firebase Realtime Database, and Firebase Storage.

### 5.1 User Login and Sign Up

Figure 1 shows the account registration and login interface for the EZ Furniture application. The interface of this application is specially designed for users who want to register an account and log in to the EZ Furniture application. There are two users who use the EZ Furniture application, namely public users and owners who have their own furniture. This interface allows both users to log in by performing an account registration activity first followed by email account verification in the account email. This authentication allows the user to sign in to the account.

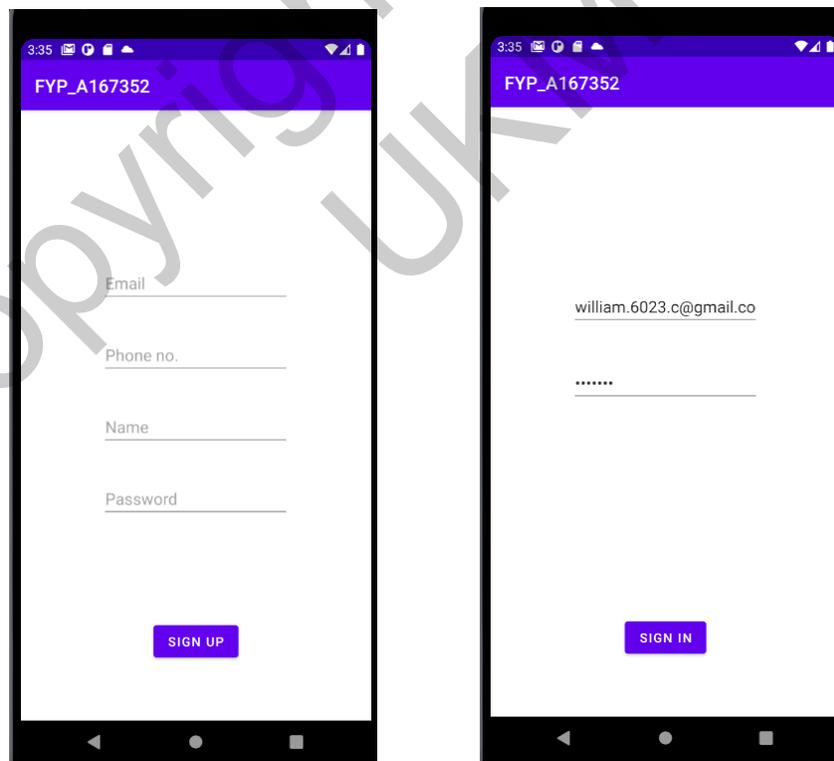


Figure 1 Login and Sign Up Module Interface

## 5.2 Customers Main Menu and Navigation Drawer

Figure 2 shows the main page of the EZ Furniture application using the navigation system. This page displays an information button to make it easier for customers to find the desired interface page. This navigation system makes the EZ Furniture application interface more organized.

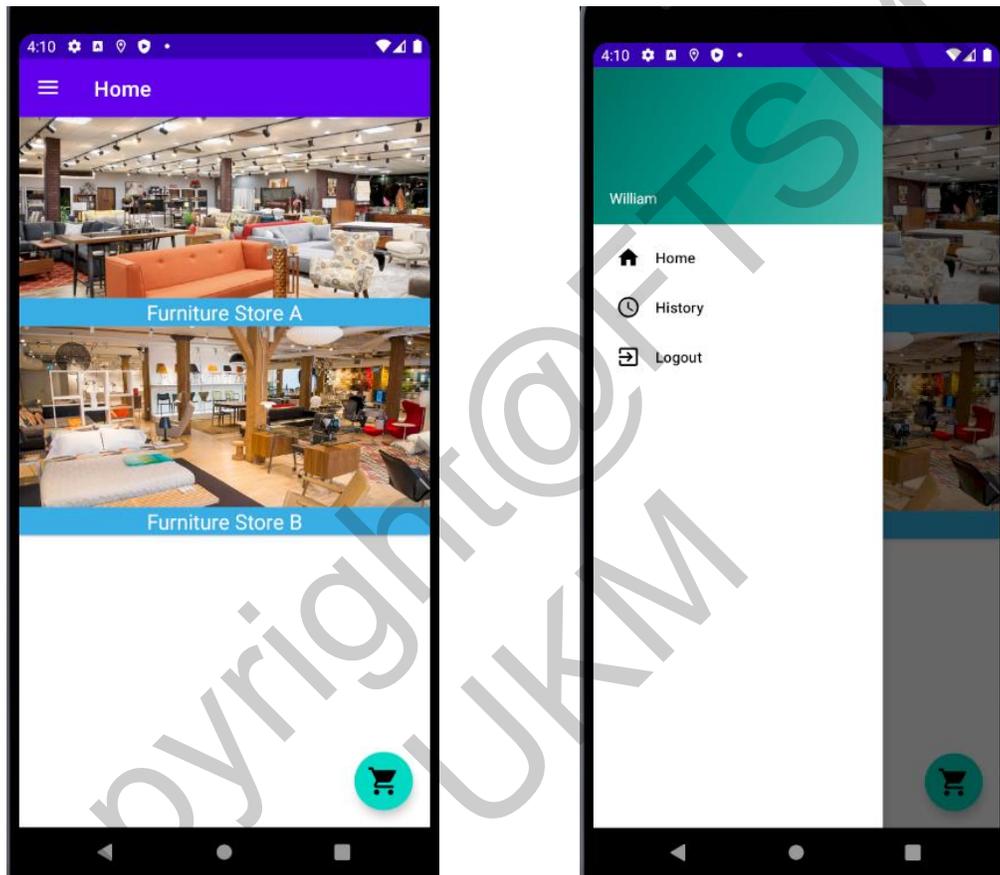


Figure 2 Customers Main Menu And Navigation Drawer Module Interface

## 5.3 Customers Furniture Information Display

Figure 3 shows the furniture display interface to customers. In this section, customers can see the furniture display clearly and even furniture information can be provided under the furniture description. Customers can also choose and find the desired furniture. The furniture description displayed allows the customer to press the display to take the customer to the next interface. An add to cart button is provided to allow customers to make furniture order.

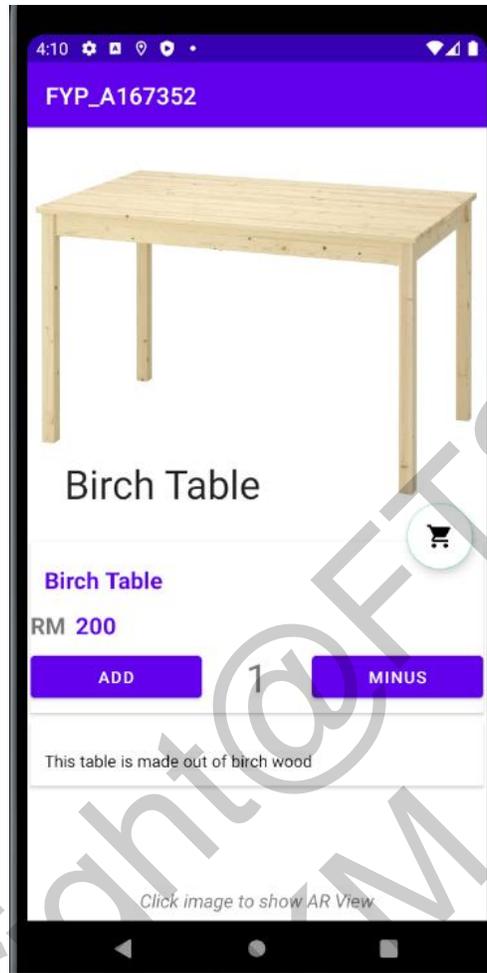


Figure 3 Customers Furniture Information Display

#### 5.4 Customers Cart Display

Figure 4 shows the customer's cart which contain all the furniture that the customer wants to buy and the number of the furniture with the total cost of all the furniture.

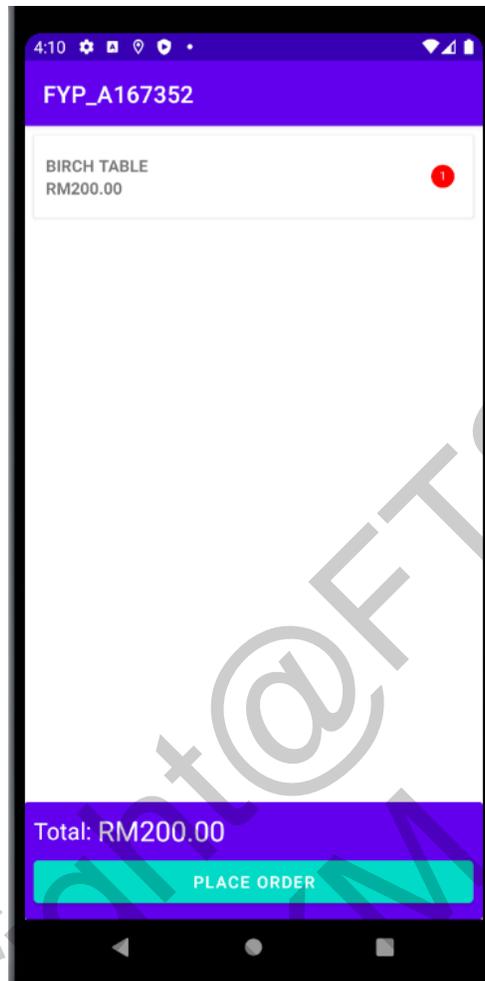


Figure 4 Customers Cart Display

### 5.5 Customers 3D Model Display

By pressing the image on the furniture information display, we will be able to see the 3D model of the furniture as long as your camera can support AR, which is shown in figure 5. We can place the furniture anywhere in the room as long as the dimension fits.



Figure 5 Customers 3D Model Display

## 5.6 Store Owner Main Menu Display

Figure 6 shows the main page of the EZ Furniture store owner application using the bottom navigation system. This page displays an add button for store owner to add or update information.

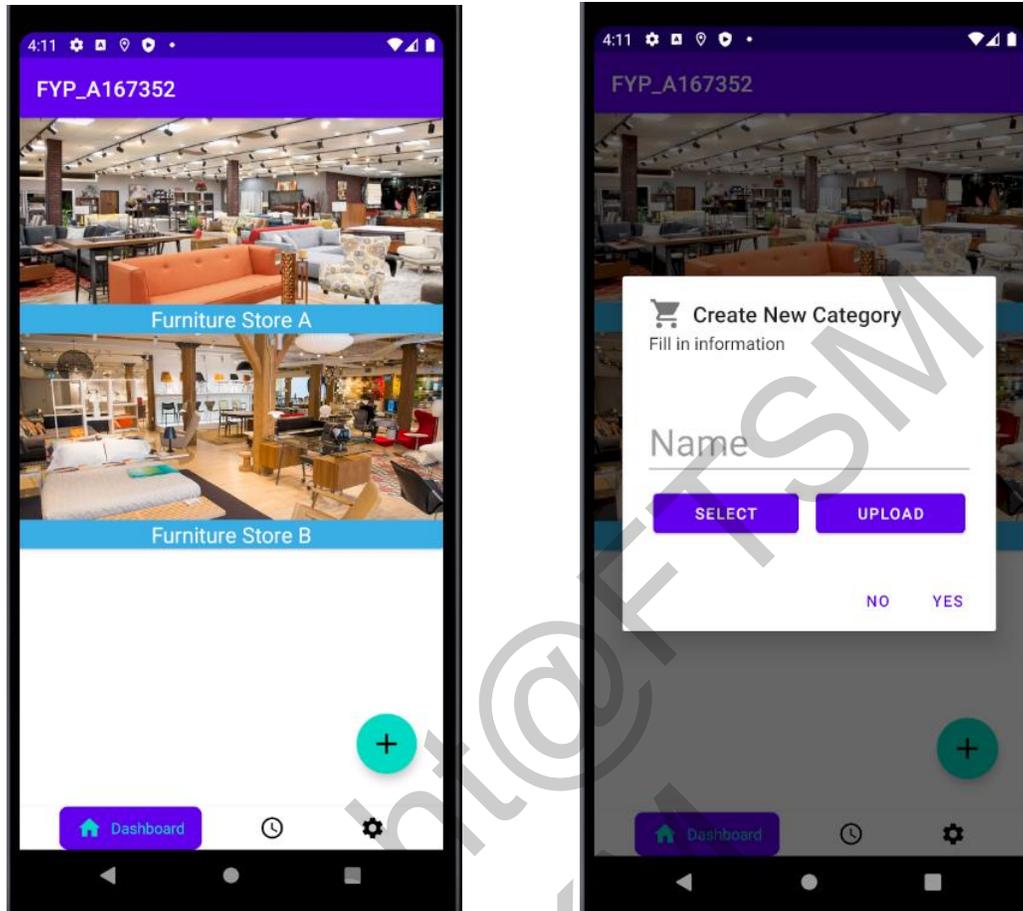


Figure 6 Store Owner Main Menu Display

## 5.7 Store Owner Add and Update Furniture Display

Figure 7 shows the furniture information and how the furniture store owner can add new furniture or update the furniture information.

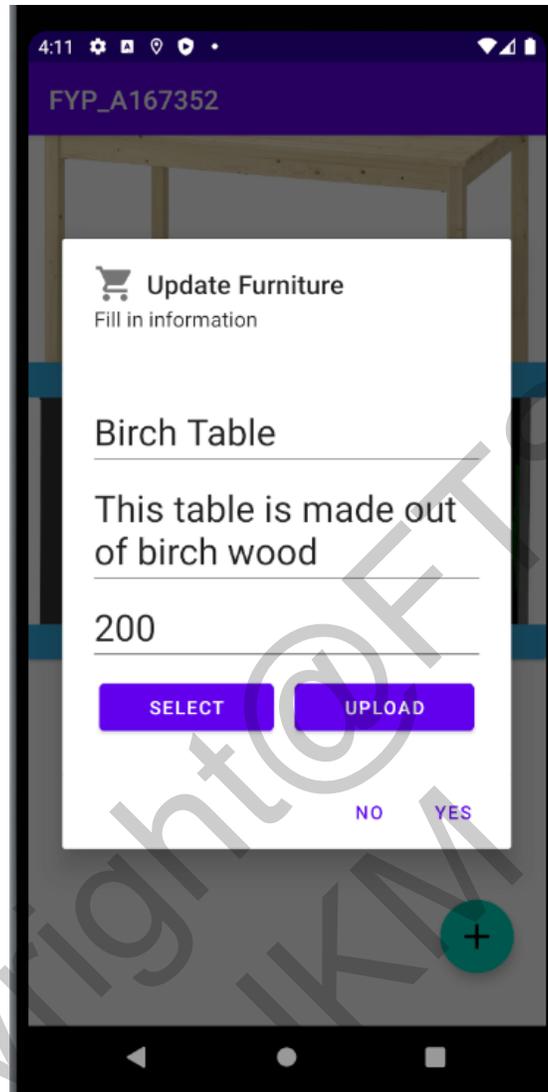


Figure 7 Store Owner Add and Update Furniture Display

The testing was conducted on 17 and 18 June 2021, online at Microsoft Teams involving respondents from UKM students and the general public. This test uses a questionnaire method distributed to 10 respondents online on whatsapp application. Therefore, each respondent must also download the apk file of the EZ Furniture application to make it easier for respondents to answer the questionnaire session to evaluate this application in terms of application usability. This questionnaire contains three different sections that must be filled by respondents in terms of usability, satisfaction level and application design. All respondents' information will be recorded to evaluate the three parts in more detail.

## 6 CONCLUSION

In conclusion, the EZ Furniture application was successfully developed according to the given time. This application needs to be improved in terms of functional and non-functional to produce a complete EZ Furniture application that can be widely commercialized. Accordingly, this application deserves attention and can be used more widely in the future. The use of the application can indirectly provide benefits and advantages to customers where this project can produce an EZ Furniture application that can provide convenience to users.

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## 7 REFERENCE

Tatyana Shavel (2020). The Rise of Augmented Reality in Interior Design and Property Development. Retrieved from January 6, 2020 Iflexion blog. Website: <https://www.iflexion.com/blog/augmented-reality-interior-design>

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