



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

## **SECP1513-03 TECHNOLOGY AND INFORMATION SYSTEM**

### **Design Thinking Project Report**

**Product Name : A.R.E (Augmented Real Estate)**

**Group Name : Tech Titans**

Prepare for: Ts. Dr. Muhammad Iqbal Tariq bin Idris

			
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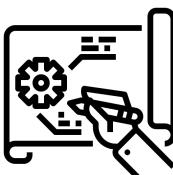
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## INTRODUCTION

### What is Design Thinking?

Design thinking is a problem-solving and innovation process that emphasizes understanding and empathy for the end user. It is a human-centred approach to tackling complicated challenges and developing novel solutions. The design thinking process is often divided into numerous iterative stages. While the precise procedures may differ depending on the source, the following is a widely used structure with five essential stages:

 Empathize	You put yourself in the user's shoes to understand their needs, experiences, and pain points. You can conduct interviews, surveys, or observations to gain insights into their behaviors and motivations.
 Design	Once you've gained insights, you can define the problem you wish to fix. You should frame the problem in a way that is specific, actionable, and relevant to the user's needs.
 Ideate	In this step, you come up with as many solutions as you can for the issue. You can use brainstorming techniques, such as mind mapping to come up with creative solutions.
 Prototype	Prototypes are made to test the concepts once the best ones have been chosen. Prototypes can be anything from fully functional models to sketches or mockups. The objective is to improve the solutions and gather user input.
 Test	In the final step, you test the prototypes with users and gather feedback. This feedback will help you refine the solutions and ensure that they meet the user's needs.

## **DETAIL STEPS**

In December 2023, our group was given a task to create a prototype based on our assigned topic which is augmented reality. After discussing our given topic, we have gathered two different potential clients that each represent the multiple wants and preferences in the Real Estate industry. One of them would be Real Estate Agents whose aim is to reach their quota and sell as much Real Estate to customers as they can. In order to do this, they would need a more accurate and interactable model to convince customers with. Another potential client are the customers. Customers usually despise wasting time and typically loathe physically going back and forth to check and observe real estate. They would want a way to check the real estate in an efficient and convenient manner.

### **2.1 Empathize**

The first step we took is by holding an interview with an experienced professional real estate agent, so we can have better insight on the problems faced as a client while previewing a house. The interview was held with Firdaus Kali Khan Hafid by using an online platform, Webex. We managed to ask our questions and find out the problems faced by clients. The information gained in the interview alone has helped us a lot in the next step.

### **2.2 Define**

After the empathizing stage, we discuss the information gathered from the interview session together. In our discussion, we managed to come up with 3 problems with the current method of using traditional pictures of the house to promote it, 2D Floor Plans, or taking buyers to physically visit the house. The problems are the real estate may not provide sufficient information about a property such as advertised, provides information however may not be intuitive for the customer to parse info from, and finally takes time, especially when the distance between the real estate and customer is large.

## **2.3 Ideate**

Since we already have a clear problem statement after listing and categorizing the problems from the last stage. We can put our heads together and brainstorm various ideas to generate new solutions for the problems. There are several solutions for the problems that we are able to find.

## **2.4 Prototype**

In this stage, we finally design and make our prototype. After deciding the features and functions, we distributed the task among ourselves and designed the prototype. The prototype was based on the ideate stage.

## **2.5 Test**

In this stage, we have finally finished designing our prototype. We tested some of the features of the prototype such as the qr code, so we can examine its functions and features and get their opinions on our prototype to know if there are any flaws.

## **DETAILED DESCRIPTION**

### **3.1 Problem**

In the ever-evolving landscape of real estate, the quest for innovative solutions to enhance the user experience has led to the intersection of technology and property exploration. In a recent Market Analysis, the Malaysia Real Estate Market size is estimated at USD 36.76 billion in 2024, and is expected to reach USD 50.69 billion by 2029, growing at a CAGR of 6.64%. Although current methods used by real estate are serviceable, it is hardly sufficient in such a rapidly growing and competitive landscape. From the limitations of physical viewings to the impersonal nature of property listings, the real estate industry faces a crucial juncture where technological advancements might offer massive transformative potential.

The recent paradigm shift due to the COVID-19 pandemic has prioritized the necessity for remote solutions in property viewing. The traditional way of viewing property in-person not only takes time and effort, but it may add further complications towards customers interested in property in far away places. Additionally, the cookie-cutter and bland nature of existing property listings overlooks the importance of personalization, leaving users struggling to envision a property as their own. This lack of customization and personalization diminishes the emotional connection between users and potential homes or workspaces. Furthermore, the overwhelming abundance of information during the property search process hampers decision-making efficiency, leading to user frustration and potential abandonment of the search. These issues collectively create a significant user experience gap in the real estate industry. Recognizing these challenges presents an opportunity to advance and revolutionize the real estate industry as a whole by offering a solution that addresses these pain points, providing users with a more immersive, personalized, and efficient property exploration experience.

### **3.2 Solution**

After recognizing the problems and exploring all potential solutions through the brainstorming process, we have acknowledged a way that could potentially address these problems. Augmented Reality (AR) emerges as a transformative solution, promising to redefine the traditional paradigm of property exploration. With Augmented Reality, customers are able to interact with their properties with an added layer of customization and personalization.

Our product, 'A.R.E' uses Augmented Reality technology to simulate a 3D model of an apartment or real estate just by scanning a QR Code located anywhere, but most favorably on a piece of paper. It is very seamless and easy to use, only needing a phone to scan the QR Code. This makes it quite attractive to both customers and sellers as it doesn't require a lot of hassle to create.

Although simple it shows a lot of information in its simplicity, utilizing the basic way of 'show, don't tell'. With this, the customer is able to know more about the property they intend to buy in an easy to understand manner while also becoming compelled to buy it due to the sheer novelty of AR.

### **3.3 Team Working**

To make sure everything goes to plan, we first discussed together on who would be the leader of our group. Unanimously, we chose Daniel because of his sufficient leading skills. Then, we shifted the topic towards what our product will be. Eventually, we ended up on Augmented Reality and branching off from that, AR in Real Estate after some researching and deliberating. we applied five phases to solve a problem which are empathy, define, ideate, prototype and test.

After that, we began doing interviews. Amer, Daniel and Afif began interviewing with Encik Firdaus who is a professional real estate agent in Malaysia to get his insight on our project. Using this information, we were able to highlight and revise our ideas and problems. We shared any further deliberation through Whatsapp and put them into the report using google documents.

Finally, we began working on the prototype where Daniel was in charge of the website design, Anamul was in charge of making the 3D Model of a house appear from a QR Code, Afif was in charge of the introductions and Amer and Dillan were in charge of Q&A. Through our collaborative efforts, everything went off without a hitch and was able to be done correctly thanks to us doing our assigned roles well.

## **DESIGN THINKING ASSESSMENT POINTS**

Creating a design thinking assessment involves a thoughtful process to ensure that it effectively evaluates the key aspects of design thinking. That's why we first and foremost clearly outline the objective of the assessment that is Augmented Reality in Real Estate business.

At the very beginning of the stage, the empathize stage, our team members were having the conversation about how we can create something as our project that can be beneficial not just a small percentage of people rather a large amount of people. We were also discussing this with our TIS lecturer and found out a friend of his is a businessman in a real estate agency. So, we decided to get in touch with him and have an interview session to get to know more insight in-depth and identify the problem which he was facing.

Next, we move to the define phase where we analyzed the problem statements which were mentioned by the agent during the empathize phase. After doing some research on our own, we categorized the problems and listed them down.

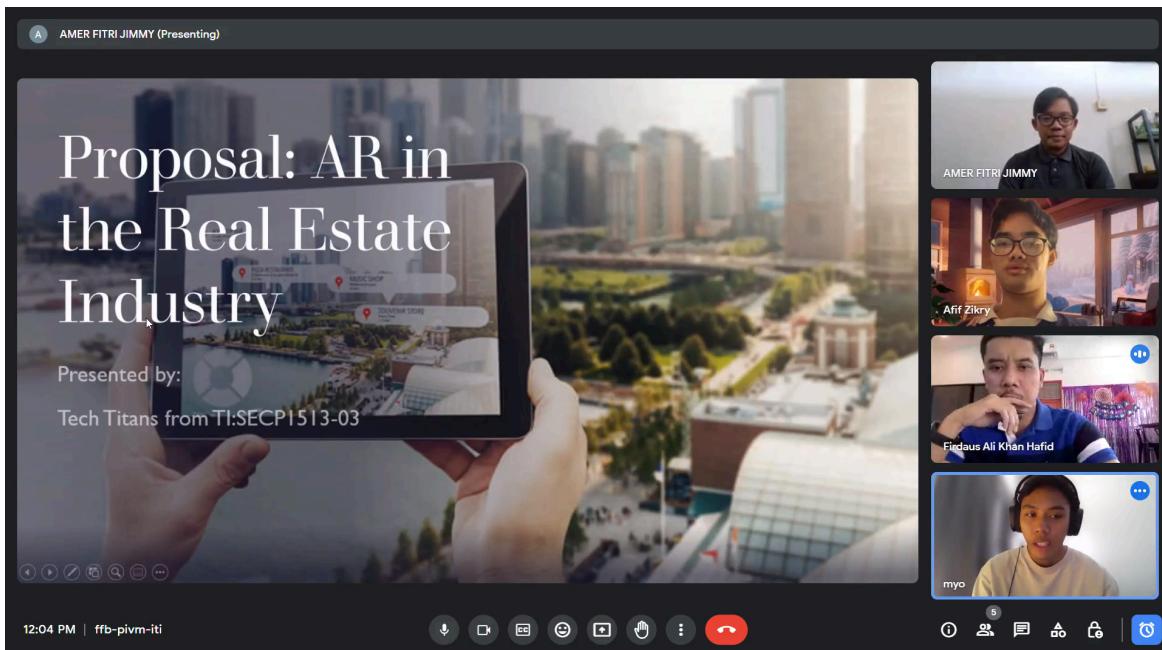
We then proceed to the ideate phase. During this phase, we brainstormed ideas and solutions for the problems listed in the define phase. This is when the assessment point came into its role by filtering out all irrational and unrelated ideas or solutions. At the end of this phase, we had come into agreement in choosing the best solution.

Lastly, we proceed to the prototype phase by using the solution created during the ideate phase. We designed our prototype which is a website that has an AR option on it. This will allow potential buyers to visualize properties in a virtual environment, right from their home. Clients can use their smartphones or devices to virtually walk through spaces, assess dimensions. This technology enables a more in-depth understanding of property's layout, features, and potential and will make it easier for them to make decisions which will save a lot of time and energy for both agent and customer.

## DESIGN THINKING EVIDENCE

### Empathy Phase

Our team conducted an interview session with Encik Firdaus who is a professional real estate agent to get his insight on our project. We also have conducted a survey through Google Form to get information from the customer side. From here we are able to get to know what are the challenges and problems of current ways of selling properties.



**Figure 1 :** Interview with Encik Firdaus

```
Q1 : What is the current way you use in real estate business?  
Q2 : what are the challenges when dealing with customer?  
Q3 : which platform should we implement the AR? using website or develop an application?  
Q4 : as someone who is in this field, what is your thought about our idea? i sthere anythings you want to add on?
```

**Figure 2 :** List of questions during the interview

What are the challenges when buying properties? \*

Time-wasting as you need to visit the properties physically

Photographs and brochures lack the immersive experience that a physical visit provides

3D miniatures may not accurately represent the actual property

Other...

In your opinion, is it important to have realistic and accurate visuals when buying properties? \*

Very Important

Important

Slightly Important

Not Important

How familiar are you with Augmented Reality (AR) technology? \*

Very Familiar

Familiar

Slightly Familiar

Not Familiar

**Figure 3.1**

Do you prefer AR being used when buying properties? \*

Yes

No

Maybe

Which device would you prefer to use the AR feature? \*

Smartphone

Tablet

Glasses

Will AR help you make better decisions? \*

Yes

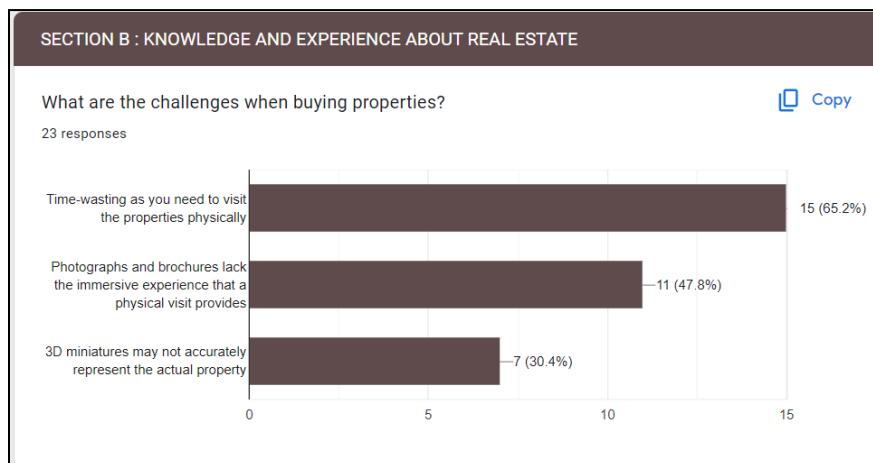
No

Maybe

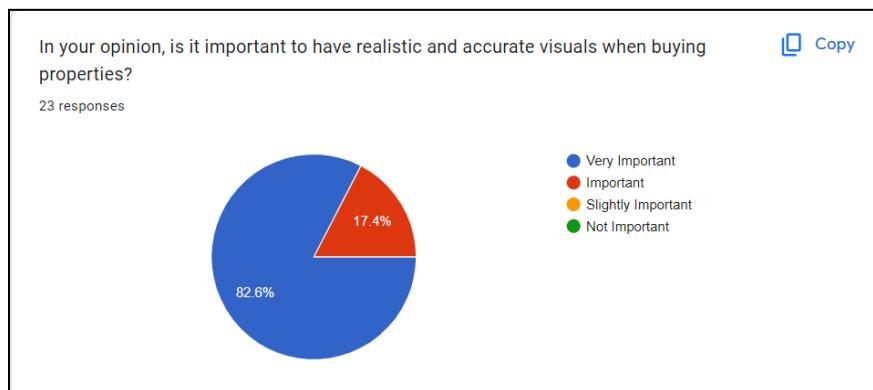
**Figure 3.1 and 3.2 : List of questions from Google Form**

## **Define Phase**

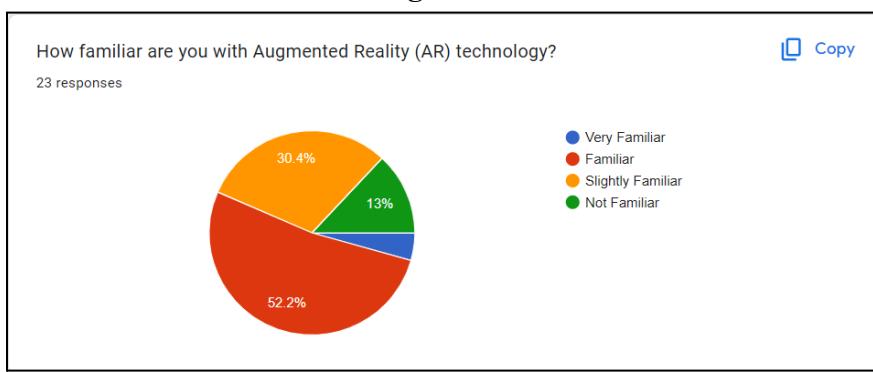
During this phase, we gathered all the information we got from the interview session and from the google form. From there we were able to get a better understanding of problems faced by them which allowed us to tailor our solution more effectively to address their specific needs and challenges. Below here are the result from the Google Form:



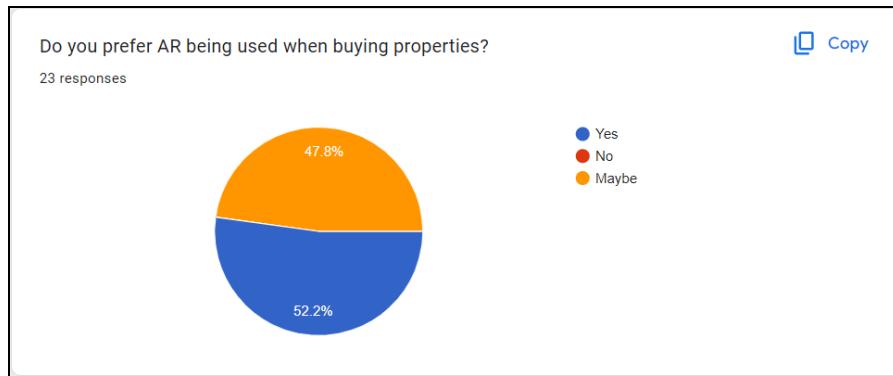
**Figure 4.1**



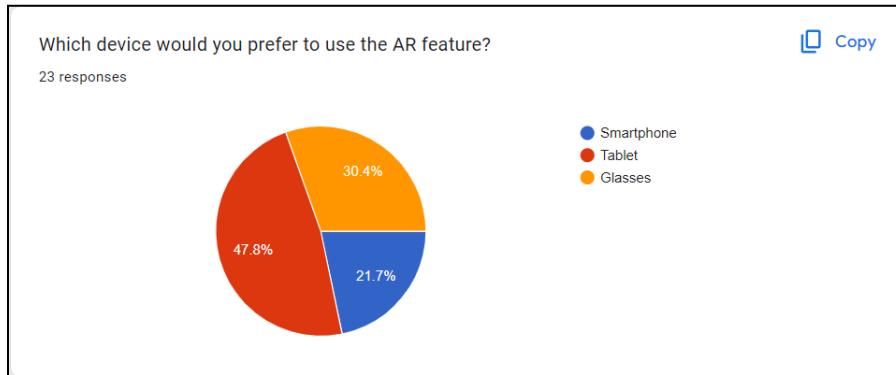
**Figure 4.2**



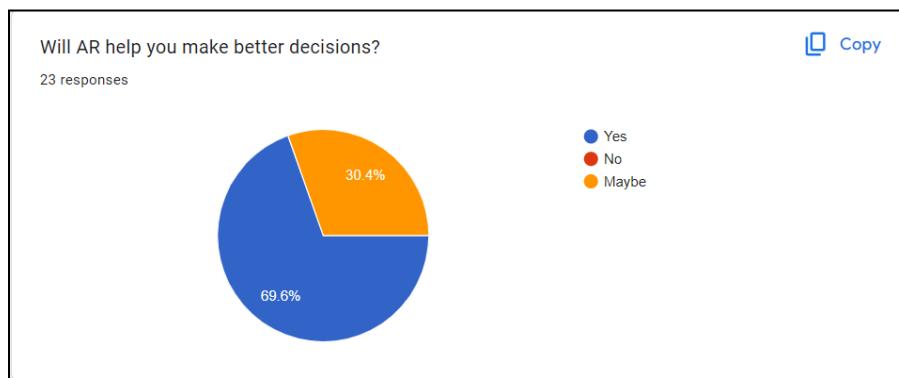
**Figure 4.3**



**Figure 4.4**



**Figure 4.5**



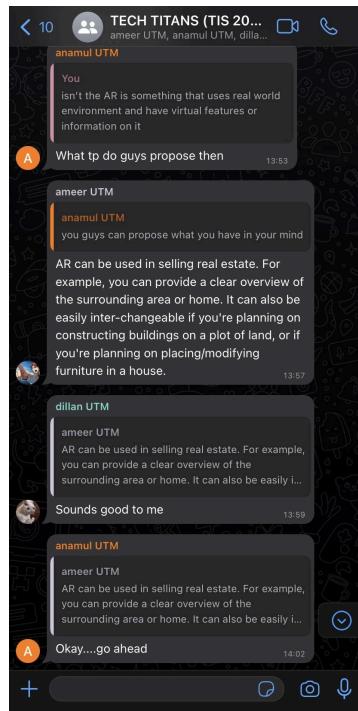
**Figure 4.6**

## **Ideate Phase**

In this phase, we discussed among ourselves to find the best solution to solve the problem we have gathered. We brainstormed and stated all the possible solutions and lastly we came up with the idea to implement Augmented Reality (AR) into the real estate field.



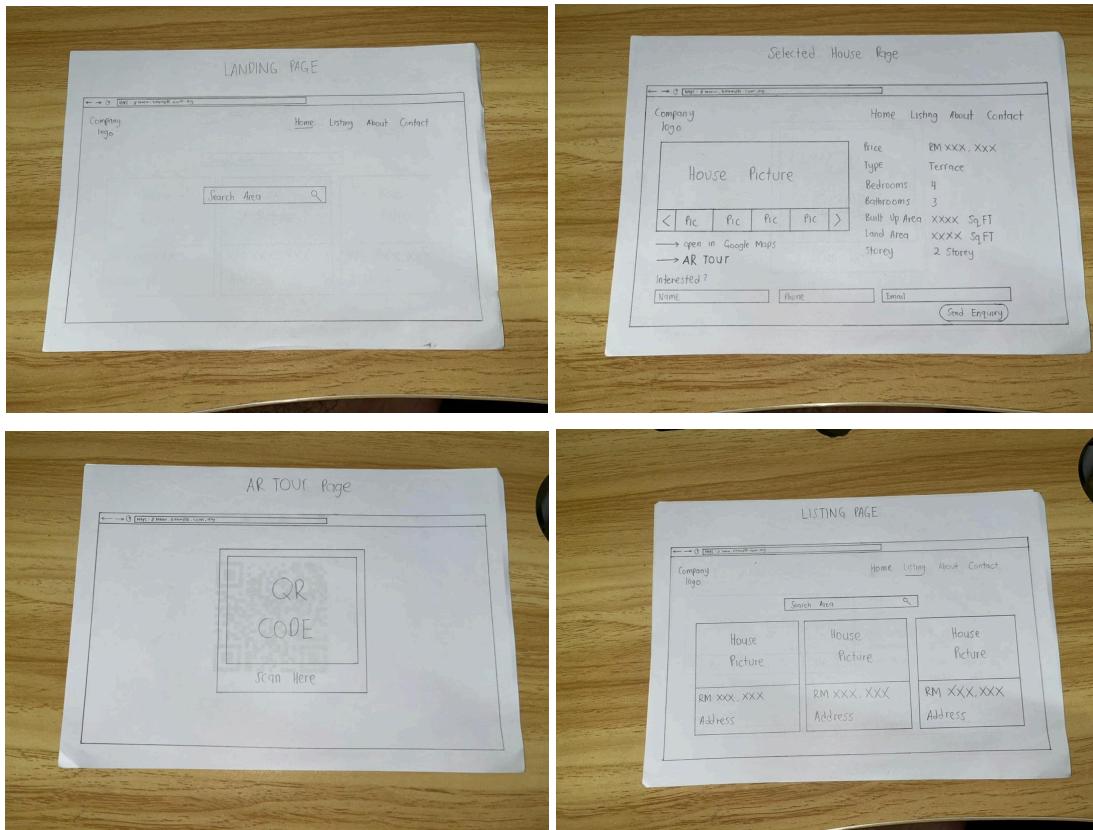
**Figure 5.1**



**Figure 5.1 and 5.2:** shows the discussion process about the solution

## **Prototype Phase**

In this prototype phase, we used all the ideas, insight, and information we collected from previous phases as the foundation and guidance in developing our prototype and ensuring that we meet all the needs of the users.



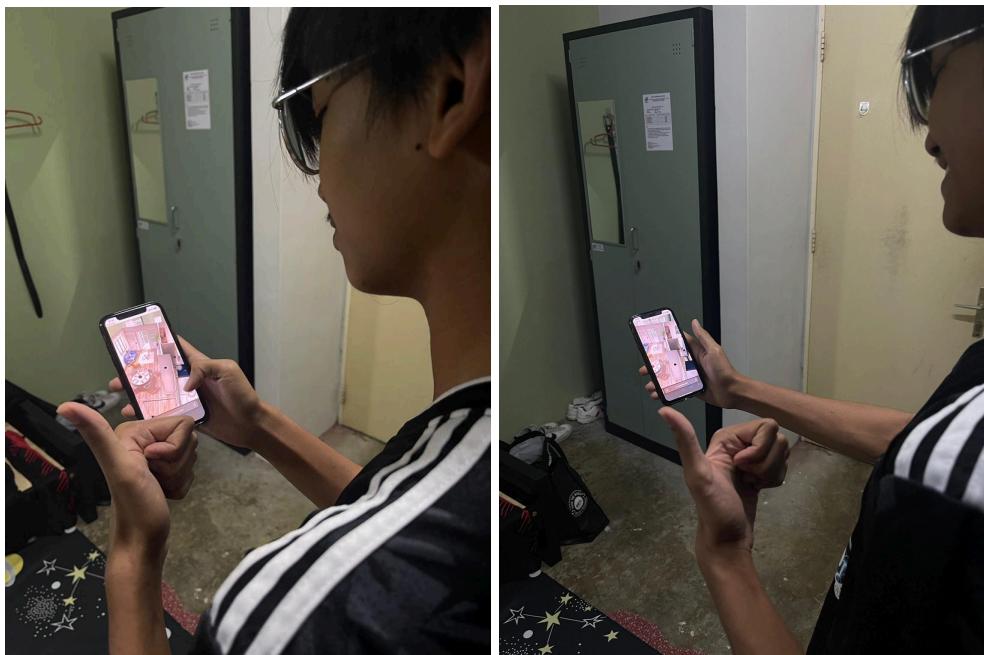
**Figure 6.1:** Website prototype



**Figure 6.2:** Product prototype

## **Prototype Testing Phase**

During this phase which is to test the prototype, we ask several users to test our prototype. Most of them gave positive feedback toward the prototype and were impressed by it. One of them also stated that this could be useful for the real estate agent to attract customers as the first step to make them buy the properties



**Figure 7.1:** shows the user is testing the prototype

## **REFLECTION**

1. Mior Danial Hakim Bin Mior Zainul Basri (A23CS0111)

### **What is your goal/dream with regard to your course/program?**

My goal regarding my course which is computer network and security is to contribute to the advancement of secure technologies in digital systems and use my expertise to develop innovative solutions that protect data, networks and applications from potential cyber threats.

### **How does this design thinking impact on your goal/dream with regard to your program?**

Throughout the process of design thinking, it enhances my ability to create innovative and effective solutions ensuring that the solutions address real-world challenges. It also encourages me to collaborate with other people so that I can find the best solution.

### **What is the action/improvement/plan necessary for you to improve your potential in the industry?**

To improve my potential in the industry, I plan to always seek more knowledge by continuously learning, stay updated with the latest cybersecurity trends, get relevant certifications, participate in hands-on projects and find a community that shares the same interest.

2. Amer Fitri bin Jimmy (A23CS5041)

**What is your goal/dream with regard to your course/program?**

My goal with regard to my course/program is to acquire a deep and comprehensive understanding of the subject matter. I aspire to develop not only the knowledge but also the practical skills necessary to excel in my field and use these opportunities to leverage my mark on the industry in an impactful way.

**How does this design thinking impact on your goal/dream with regard to your program?**

This design thinking has allowed me to experience firsthand working together in a group and has instilled into me the importance of not only good teamwork, but also efficient leadership. This will certainly be useful in my upcoming endeavors to solve many problems in the future.

**What is the action/improvement/plan necessary for you to improve your potential in the industry?**

I must improve myself by studying and increasing my well of knowledge on the matter and also the trends circulating the industry so that I may apply it whenever the time comes. I should also improve my practical skills via practice so that I can get used to my application of knowledge.

3. Anamul Hasan Rifat (A23CS4006)

**What is your goal/dream with regard to your course/program?**

My goal is to learn and familiarize myself with various kinds of programming languages and also gain as much knowledge and experience and contribute substantially to innovative solutions and effect positive change, particularly in domains such as cybersecurity or data analytics.

**How does this design thinking impact on your goal/dream with regard to your program?**

This design thinking project emphasizes the importance of effective collaboration and teamwork and by collaborating with my class-fellows leads to a broader range of ideas and perspectives. Exposure to diverse viewpoints fosters creativity and innovative problem-solving approaches that can be valuable for my future career.

**What is the action/improvement/plan necessary for you to improve your potential in the industry?**

In order to improve myself, I'm planning to stay more updated with the latest industry trends, technologies, and best practices alongside building a professional network by attending industry events, joining online forums, and connecting with professionals in the field.

4. Dillan Revada (A23CS0290)

**What is your goal/dream with regard to your course/program?**

My goal regarding my network and security course is to improve my ability on recognizing and solving problems, gain knowledge, and adapt with the evolving technological landscape and the increasing interconnectedness of digital systems as a cybersecurity.

**How does this design thinking impact on your goal/dream with regard to your program?**

From this design thinking project I gain the opportunity for enhanced collaboration and teamwork skills. Other than that, the exchange of ideas and perspectives within a group can lead to innovative solutions, which can be useful for our future.

**What is the action/improvement/plan necessary for you to improve your potential in the industry?**

To improve myself, I'm planning to gain as much knowledge as possible and stay updated with the latest industry trends, technologies, and best practices. Furthermore attending industry events and workshop events.

5. Wan Muhammad Afif Zikry bin Wan Ruslan (A23CS0282)

**What is your goal/dream with regard to your course/program?**

My goal is to improve my social skills and how to recognize one problem and then solve it. I want to learn a lot of new skills or something work related to cybersecurity so that I can contribute to the development of cybersecurity in this world.

**How does this design thinking impact on your goal/dream with regard to your program?**

From this design thinking, I improved my social skills and learned that teamwork is really important to solving problems and improving my ability to create an innovative solution to one problem.

**What is the action/improvement/plan necessary for you to improve your potential in the industry?**

To improve, I will always follow the development of IT and learn every skill possible that is important in cybersecurity and know a lot of people so I can create a connection with people that are interested in the same field.

## **TASK DISTRIBUTION**

No.	Members	Task
1.	Mior Danial Hakim Bin Mior Zainul Basri A23CS0111	<ul style="list-style-type: none"><li>• Report Writing (Design Thinking Evidence)</li><li>• Prototype Sketch</li></ul>
2.	Wan Muhammad Afif Zikry Bin Wan Ruslan A23CS0282	<ul style="list-style-type: none"><li>• Report Writing (Introduction)</li><li>• Video Preparation</li></ul>
3.	Anamul Hasan Rifat A23CS4006	<ul style="list-style-type: none"><li>• Report Writing (Design Thinking Assessment Points)</li><li>• Prototype Design</li></ul>
4.	Amer Fitri Bin Jimmy A23CS5041	<ul style="list-style-type: none"><li>• Report Writing (Detailed Description)</li><li>• Presentation Slides Preparation</li></ul>
5.	Dillan Revada A23CS0290	<ul style="list-style-type: none"><li>• Report Writing (Detailed Steps)</li></ul>

## **REFERENCE**

1. Mordor Intelligence Research & Advisory. (2023, December). *Malaysia Real Estate Market Size & Share Analysis - Growth Trends & Forecasts (2024 - 2029)*. Mordor Intelligence.  
<https://www.mordorintelligence.com/industry-reports/analysis-of-real-estate-market-in-malaysia>