TECHNOLOGY AND INFORMATION SYSTEM (SECP1513)

LOW FIDELITY PROTOTYPE PROJECT (PART 2)

INTERNET OF THINGS (IoT)
SMART HOME

GROUP MEMBERS   : 1. MUHAMMAD RIDZUAN BIN BAKAR (A21EC0091)
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                      4. FARHANAH AINA BINTI MD AYUB (A21EC0024)

SECTION   : 10
GROUP   : 6

LECTURER'S NAME : DR NAGHMEH NIKNEJAD

Introduction

This project is about the 4th IR Technologies which is the Internet of Things (IoT). This project is about creating a low fidelity prototype which can provide solutions to the problems created by our client, Mr. Thamrin. Our main objective is to create a Smart Home application system that applies to our client requests that specialize in the home construction industry. The service that we use to design this application was based on the cloud computing service provider, Amazon Web Services (AWS). We created an application that is simple and convenient for the user as our client has no experience in using IoT.

In the second part of the project, we provide the activity log journal of our group progress from the beginning till the end. Furthermore, we also elaborate on our clients problems with more details and provide solutions for the obstacles and also explain the cloud architecture using the AWS architecture design. Moreover, we created a business proposal flow diagram along with the explanation to describe concisely the business flow of our smart home application.The business flow diagram is a visual representation of one of the core business processes.It shows what happens as data passes from one task to the next until completed.Lastly, we provide the low fidelity mock-up to visualize the last project's results and the reflections from each of the group members.

Log Journal

20 DECEMBER 2021	First Meeting	- Introduction - Discussing about the project - Brainstorming
24 DECEMBER 2021	Second Meeting	- Distributing the task - Ridzuan and Fazreen are assign to designing the project(prototype) - Dini and Farhanah are assign to make a simple draft on how the prototype works
25 DECEMBER- 27 DECEMBER	Beginning task	Time given to finish the task to be discuss in next meeting
27 DECEMBER 2021	Recheck	Confirmation of submission for the part 1 of the project
3 JANUARY 2022	Third Meeting	- Continuation of the part 2 of the project - Distribute task for part 2 - Dini and Farhanah are the designer - Ridzuan and Fazreen are assign to conclude the report
10 JANUARY 2022	Last Meeting	Finishing overall project until 27 January
20 JANUARY 2022	Presentation	Project Presentation in the class
27 JANUARY 2022	Submission	Project submitting in the e-learning

Problem

       A smart home app, also known as a home automation app or a smart home automation app, is a smartphone or tablet application that allows you to control and manage connected non-computer items in your house remotely. For our client, his company is the first Architecture Company in Malaysia that will develop the house architecture along with the smart home applied to it. Since the company has never been involved with the IoT things, it will be hard for them to adapt with the system that will be developed in the house.

       Furthermore, the smart home technology in Malaysia can mostly get expensive. Installing a full home with connected devices and appliances may be costly. There could be substantial installation charges, which could run into the thousands of dollars. Depending on the system's quality, there may be no limit at all, and many individuals may be unwilling to spend this much money on their smart home.

       Not just that, the safety and security issues also will be pointed out especially when we are using something that is related to the internet. There will always be a chance that the system can be hacked. Furthermore, you may not be able to control your smart home device from your office or other remote locations if you are unable to establish a suitable connection with your gadgets. For example, if there are issues with the connection between your smartphone and your household gadgets, you may be unable to control your smart home device.
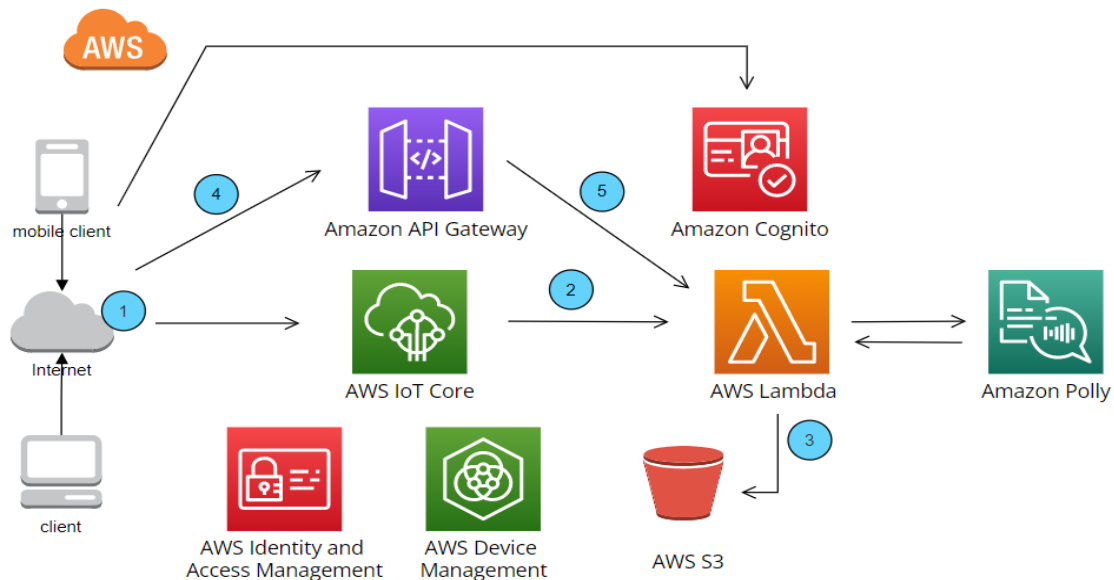
<u>Solution</u>

To overcome the obstacles above, firstly we have created a simple and user-friendly front end design. For instance, we guide the user through by navigating from each segment to one another. The user starts at the front page by signing in the username and password. Afterwards, the main menu will appear which consist of various functions according to the clients needs.All the buttons and functions in this application are well designed to provide clear instructions along with the attractive design that is not complicated to make it easier for our customer to use it without any problems which helps in increasing the convenience. Next, the user will be able to control the whole house from each room by a single click from their phone such as switching on the lights, fan, air conditioner, television, kitchen appliances and also the smart speaker. Not just that, the user also can add up more rooms to connect their electrical appliances through this app. To sum up this, this app is very convenient even though you are not a tech savvy person.

One of the disadvantages of the smart house is that they can be rather expensive due to the substantial installation charges, which could run into thousands of dollars. Depending on the system's quality, there may be no limit at all, and many individuals may be unwilling to spend this much money on their smart home. However, using a smart house, on the other hand, can save your money in the long term owing to energy savings. If you are thinking about investing in smart home gadgets, you should evaluate the long-term benefits as well as the high upfront expenditures. Since we are using the AWS cloud computing services for the Smart home technologies, AWS offers reasonable prices for each of the software that we pay according to the software that we choose to build the system which can help you save a lot of money for the very long term.

Lastly, for the safety and security issues, the Amazon Cognito software in the AWS helps synchronize and securely manage data from all users. Amazon Cognito allows users to use various public login providers such as Amazon, Facebook and Google as well as support unauthenticated visitors using a third-party software. Other than that, it enables us to save the data locally on clients' devices when there is no available internet connection or offline. Thus, we can rest assured especially when there is a sudden blackout. Amazon Cognito provides assurance on our data privacy which means it will not be sold nor shared with any third parties.
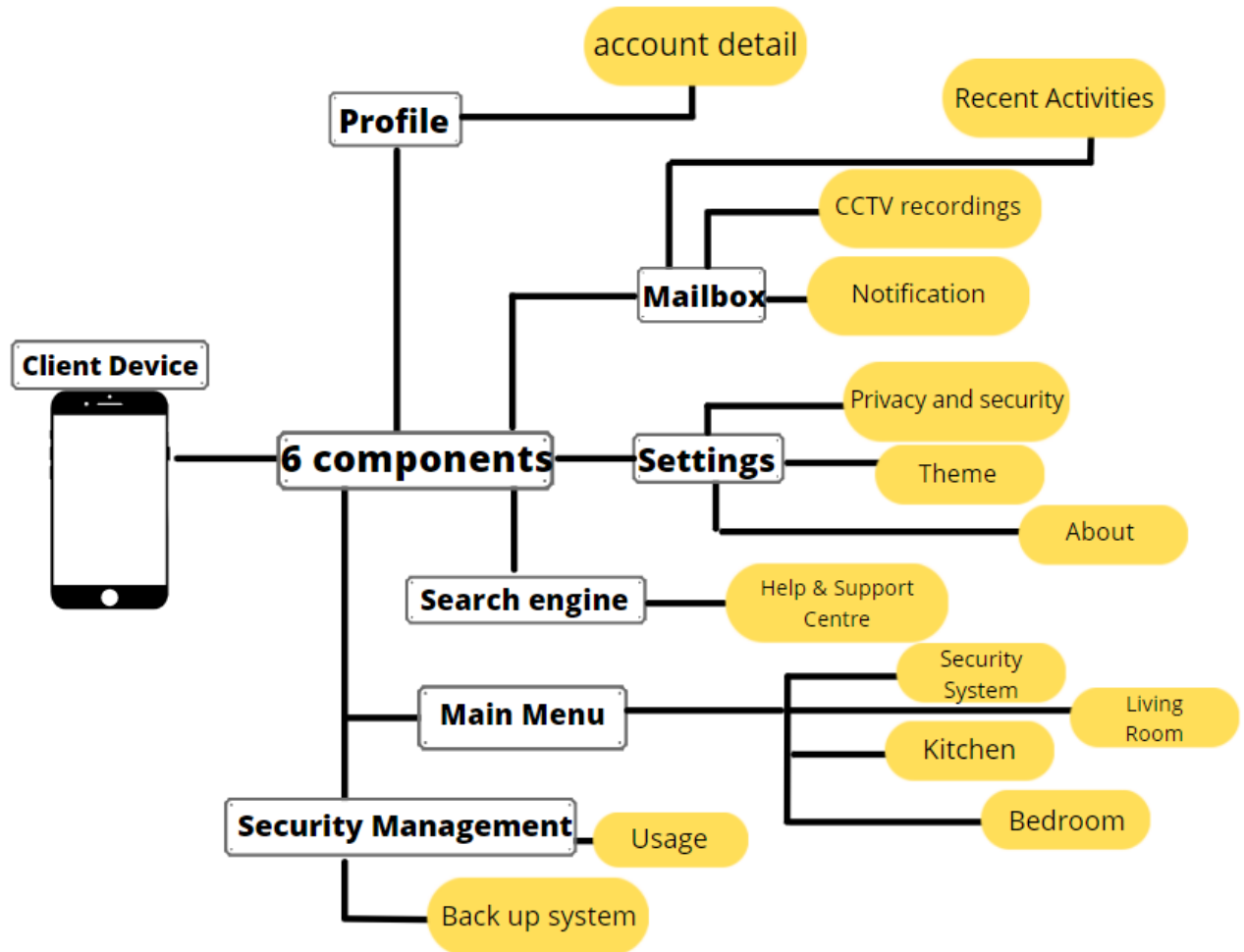
AWS Architecture Design

Authentication of users in the mobile app is handled through an integration of the customer's existing SSO solution with an Amazon Cognito Identify Pool. The smart home IoT platform is built with AWS IoT Core and AWS Lambda to provide customer device registration, easy device fleet management at scale, and the interconnection of end users and the home appliances connected to this platform.

Users authenticate from their devices through mobile apps connected to the internet . The information will pass through the AWS IoT Core. AWS IoT Core uses a rule engine to extract necessary data from the messages and pass the data to the AWS Lambda function. AWS Lambda functions generate and then return an Amazon S3 presigned URL to store multimedia such as images, audio files, and videos especially for the security cameras of smart homes. AWS Lambda function sends requests to Amazon Polly, the data goes through Amazon Prolly which converts text into spoken audio that can be generated into dozens of languages, making it easy to add speech to applications. Next, Amazon Cognito will deal with login information such as authentication, authorization and user management for our app. AWS identity and access management can specify who can access which services and resources, and under which conditions by using single sign-in identity .AWS Device Management will register, organize, monitor, and remotely manage connected devices at scale .This service is secure and easy to use. Amazon API Gateway receives requests from Mobile apps and triggers AWS Lambda function to fulfill the requests.

Business Process Flow Diagram & Low Fidelity Mock-ups

Client Device

6 components

Profile → account detail

Mailbox → Recent Activities, CCTV recordings, Notification

Settings → Privacy and security, Theme, About

Search engine → Help & Support Centre

Main Menu → Security System → Living Room, Kitchen, Bedroom

Security Management → Usage, Back up system

1

WELCOME TO SMART HOME

One place for all your security solutions

START → **2**

2

Create new Account

Already Register? **Log in here.** → **3**

NAME

Jiara Martins

EMAIL

hello@reallygreatsite.com

PASSWORD

******

Sign up

Or

f **Login with Facebook**

g+ **Sign in with Google+**

3

Login

Sign in to continue.

USERNAME

Tiara Jacqueline

PASSWORD

******

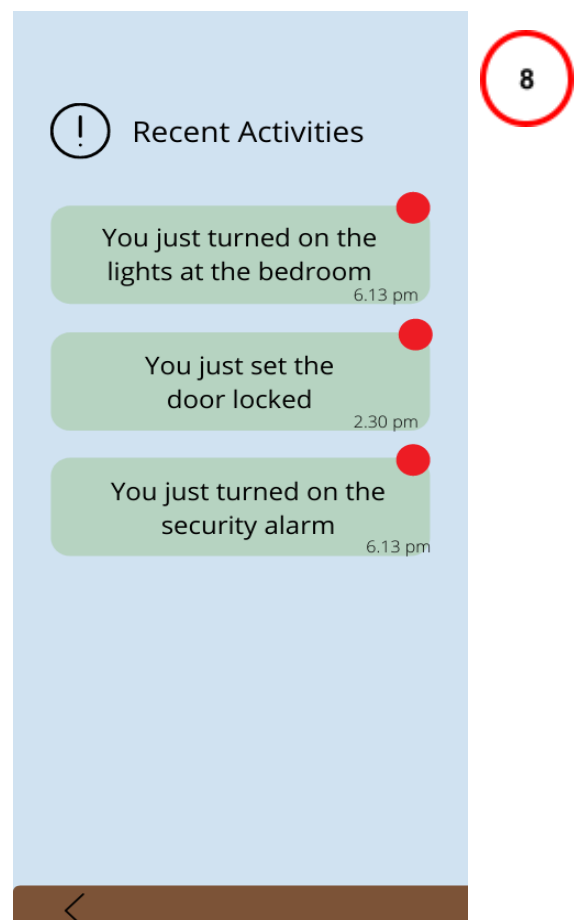**4** ← *FORGOT PASSWORD?*

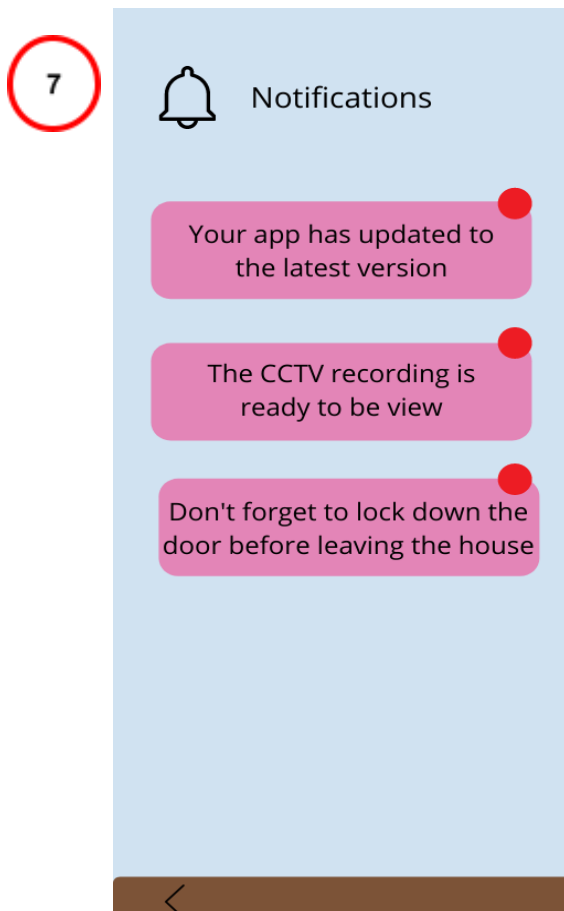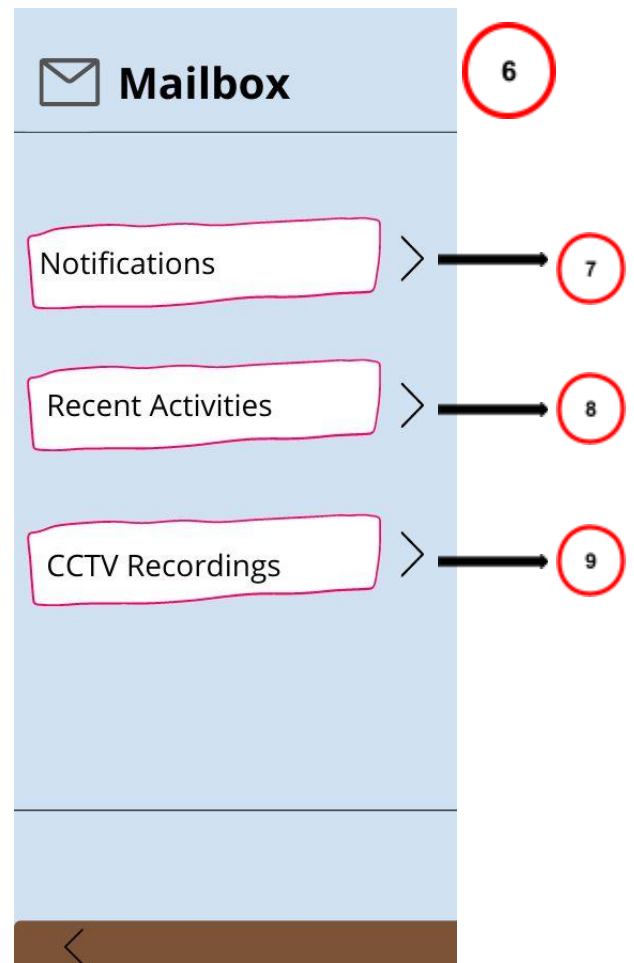**Log in** → **5**
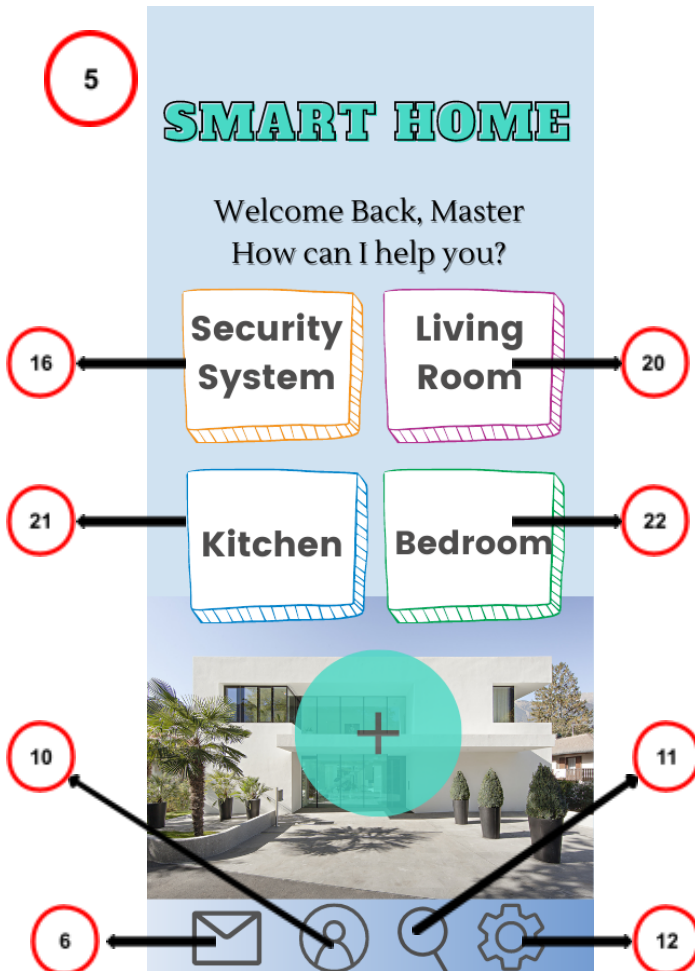

4

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Retrieve Password

Please enter email:

hello@reallygreatsite.com
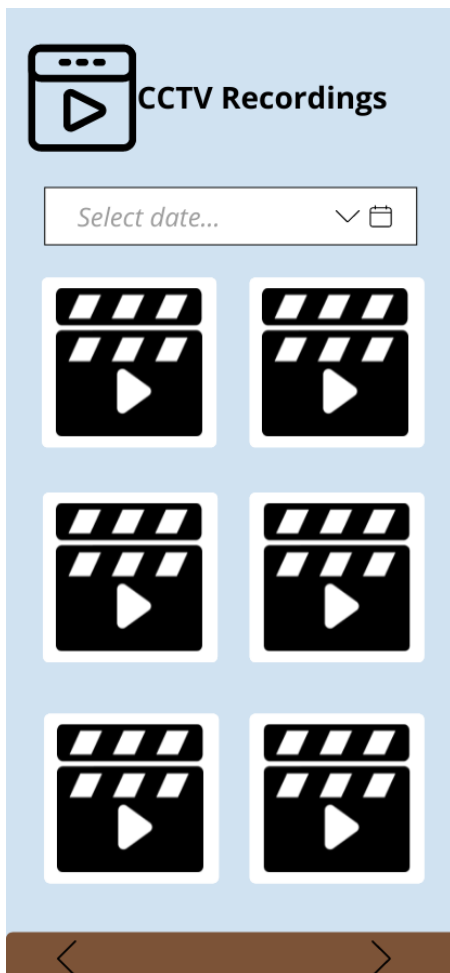
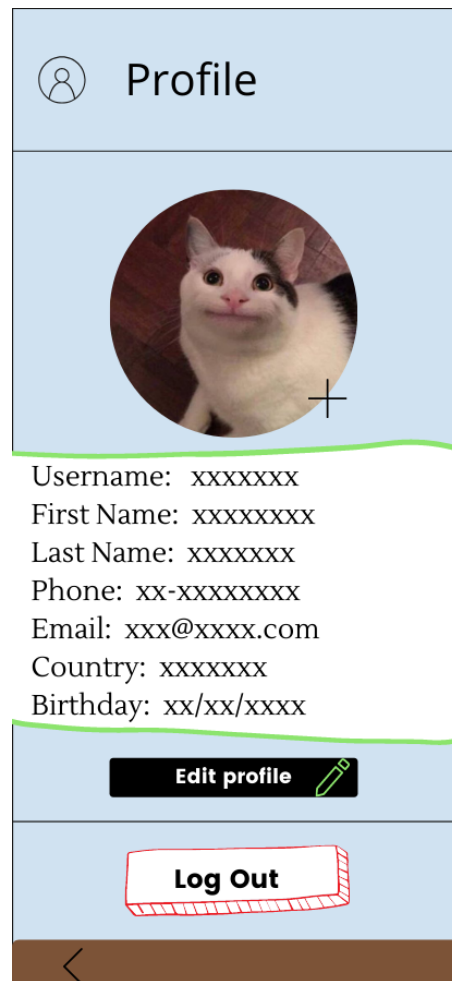We will send a verification code to retrieve your account .

Send

(5)

SMART HOME

Welcome Back, Master
How can I help you?

(16) ← **Security System** | **Living Room** → **(20)**

(21) ← **Kitchen** | **Bedroom** → **(22)**

(10) | **(11)**

(6) ← ✉ | 👤 | 🔍 | ⚙ → **(12)**

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(6)

✉ **Mailbox**

Notifications > → **(7)**

Recent Activities > → **(8)**

CCTV Recordings > → **(9)**

‹

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(7)

🔔 Notifications

Your app has updated to the latest version ●

The CCTV recording is ready to be view ●

Don't forget to lock down the door before leaving the house ●

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(8)

⊙ Recent Activities

You just turned on the lights at the bedroom ●
6.13 pm

You just set the door locked ●
2.30 pm

You just turned on the security alarm ●
6.13 pm

‹

9

CCTV Recordings

Select date... ⌄ 📅

[video thumbnails grid]

< >

10

Ⓐ Profile

Username: xxxxxxx
First Name: xxxxxxxx
Last Name: xxxxxxx
Phone: xx-xxxxxxxx
Email: xxx@xxxx.com
Country: xxxxxxx
Birthday: xx/xx/xxxx

Edit profile ✏️

Log Out

<

11

[❓]
Ⓐ **Help and Support Centre**

🔍 Search something..........

🔍 How can I know which devices work together? *click here*

🔍 What happens if the internet goes down? *click here*

🔍 *I*s my house really save from getting hacked ? *click here*

For further assistance ,feel free to contact us at **1300-888333**
or
smarthome4u@gmail.com

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12

⚙️ Settings

About ⓘ

Day mode ☀️   **13**

Push Notification ⬤

14   Privacy & Security 🔒

<

13

⚙️ Settings

About ⓘ

Dark mode ☀️

12

Push Notification ⬤

Privacy & Security 🔒

‹

🔒 Privacy & Security

14

Change Password 〉 → **15**

Emergency Alarm ⬤

📞

Emergency Call

‹

15

Reset Password

CURRENT PASSWORD

****

NEW PASSWORD

****

CONFIRM PASSWORD

****

UPDATE PASSWORD

‹

SECURITY SYSTEM 🔒

16

Security Alarm   on/off ⬤

Window Sensor   on/off ⬤

Smoke Detector   on/off ⬤

Door   lock/unlock ⬤

Camera 〉 📷 → **17**

‹

(17)

CAMERA

Garage

Living Room

(18)

Kitchen

Bedroom

(19)

(19)

Living Room

(20)

Lights

Television

Air Conditioner

Fan
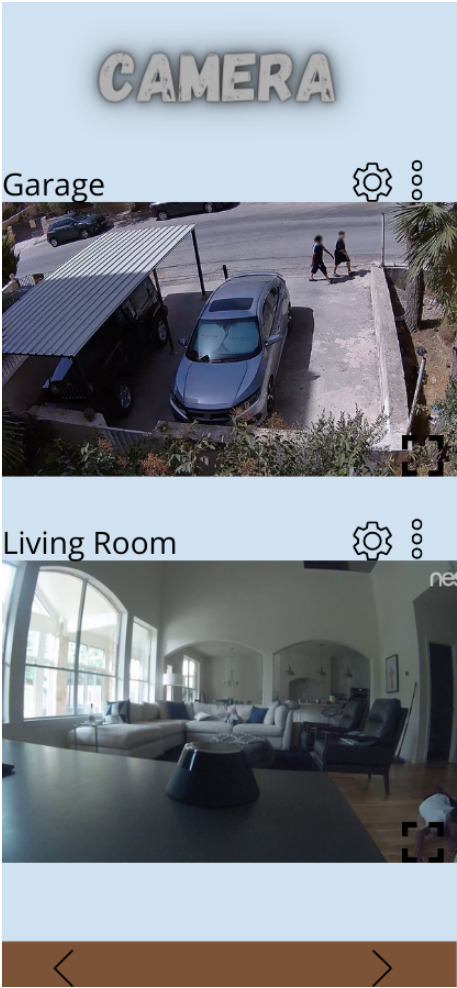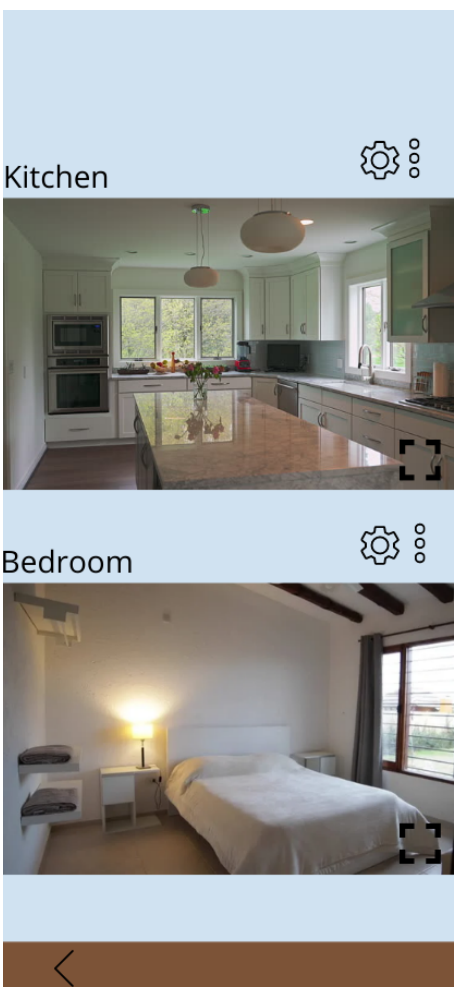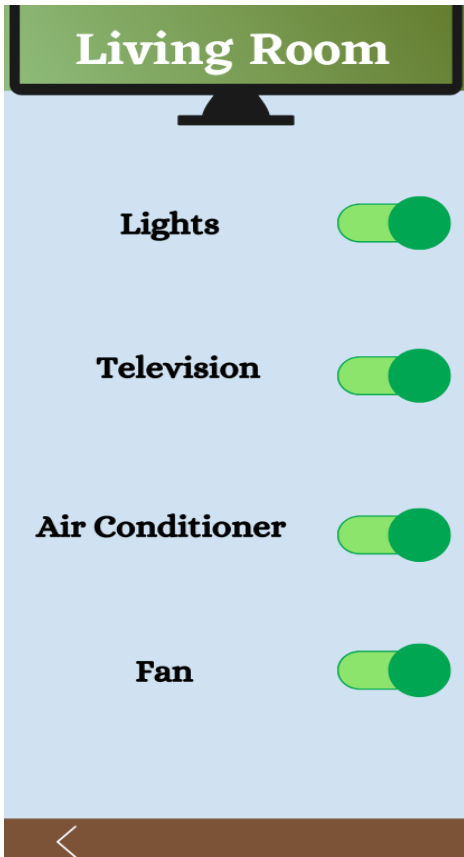
21 Kitchen
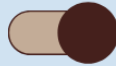
- Stove
- Oven
- Lights
- Dishwasher
- Ventilation

22 Bedroom

- Fan
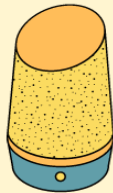- Lights
- Curtains
- Air Conditioner
- Smart Speaker

23

23 Smarty

Powered by Ai
supported by Google

tap here to speak

Volume

Bass

Group Member's Reflection

Muhammad Ridzuan Bin Bakar (Leader)

First of all, I would like to thank Dr. Naghmeh for teaching us throughout the whole semester as well as to my fellow teammate for accepting who I am. In this journey, I managed to learn a lot about Amazon web on how to use or create any type of software and also able to help me on how to design an architecture network. The website helps me a lot in order to complete the Low Fidelity Project as it gives me a motivation to learn and understand more on how to use this technology in a more efficient way especially in our daily lives. In addition, I learned that we should have good teamwork and be responsible with our part in order to strive for success during making this Low Fidelity Prototype. What's more, by having good communication and being understanding among teammates could be portrayed while producing this prototype.

As a leader, I found that most of us are having the same difficulties and problems since we're lacking some knowledge and understanding in producing this prototype by relating to this cloud computing service. Moreover, this is our first time building a low fidelity prototype which means there are still many things I am unsure of. However, I managed to solve these issues by doing a lot of research to gain more knowledge in this field. Besides that, we did a lot of discussion as a group until everyone really understood their responsibilities and asked for advice from our lecturer Dr.Naghmeh.

To summarize it, although we're having some difficulties, we managed to overcome it by helping and understanding with each other as well as getting some guides from Dr. Naghmeh. It is definitely a fun and enjoyable experience during this project as we get to know each other more and create good communication skills and teamwork skills. I know that some of us are still lacking in a certain way, but we are helping each other to improve ourselves. We all know that this project is really important to us since it might help us to find a job in the future. As a leader, I feel really proud with my teammates and I wish that I could do a better job with them. In conclusion, I'll have to improve my communication and leadership skills in order to become a better leader in the future. Hence, I really appreciate them for giving me a chance to be a leader as well as having trust and faith in me.

Muhammad Fazreen Bin Azhar

From my perspective, this project has been a lot of fun to do. The moment I spend with these guys is enjoyable because they're very kind and tolerable. What I mean about that is when I make a mistake they kindly correct me and guide me how to do the project because honestly i didn't really understand what i should do.

We also have a group chat (whatsapp) where we discuss the project. And I did learn a lot from them which was very helpful for me to finish my task. About the AWS academy, it was a good experience to use it. The site was really useful and effectively guided us to the fidelity project. Not just that, this is also my first time creating a low fidelity prototype using software. To overcome these problems, my group leader has asked our lecturer if we have something that we are not clear about. We also have discussed together if we have any problems regarding this project and together figured out the solutions.

In conclusion, I really enjoy making this project along with my teammates. Although there are many obstacles, especially the time management in finishing the project. I must keep up with the updated news on technology by doing some reading about the 4IR as it rapidly evolves and updates. Lastly, i would like to say thank you to the teachers and group members that has been a great help for me throughout this project and i will try to be better

Farhanah Aina binti Md Ayub

Along the process of completing this Low Fidelity Prototype project, I have learned a lot of things. I get to learn on how to create a Cloud Architecture based on the AWS module. My motivation to complete this project is because I find it interesting to create our own app based on the 4th Ir that we choose. Not just that, I also got to know the process to complete it from the beginning until it was completed. Furthermore, I also got to learn on how to be responsible while working in a group along with my group members and gain more experiences together.

The issues and problems that I faced throughout the journey of completing this project is, I found out that it is hard for me to create the Cloud Architecture design since this is my first time knowing about it. There are also a lot of new terms that I am not familiar with that required me to do research about it. Not just that, this is also my first time creating a low fidelity prototype using software. To overcome these problems, my group leader has asked our lecturer if we have something that we are not clear about. We also have discussed together if we have any problems regarding this project and together figured out the solutions.

After completing this project, I feel very proud about the outcome result that we had achieved. Besides that, I also found out that this industry is very interesting to learn about and I am also looking forward to gaining more experiences and knowledge about it.To improve my potential in this industry, I will try to learn more by doing research or watching some videos that are related to improve my skills and ability.

Nur Dini Fatini binti Mohd Kamal

Throughout this journey in completing this Low Fidelity Prototype, I have learned many things including cloud computing architecture like using Amazon Web Services (AWS) and user interface (UI) apps. My motivation in completing this project is that I find it very fascinating yet challenging, especially solving problems in our daily lives that require a technological approach. Besides that, I learned that we need to have good teamwork and be responsible with our part in making this Low Fidelity Prototype a success. Good communication and being understanding among teammates were being portrayed while producing this prototype.

The difficulties and problems I have encountered is that there was a lack of knowledge and understanding in producing this prototype by relating to this cloud computing service. Moreover, this is my first time building a low fidelity prototype which means there are many components that I am not familiar with. However, I managed to solve these issues by doing a lot of research to gain more knowledge in this field and explore UI applications that are free and convenient for our group members to use. Besides that, we did a lot of discussion as a group until everyone was clear on their roles and responsibilities as well as asking our lecturer Dr.Naghmeh for advice.

To sum this up, it is definitely a humbling and delightful experience in making this prototype as the difficulties we managed to overcome. I believe that there is always room for improvement especially in having a greater understanding of how the industry works. We are well aware that the 4IR industry evolves rapidly, hence, I must keep up with the updated news on technology by doing some light reading and watching videos relating to this field. Last but not least, I need to improve my problem-solving and programming skills as this is essential for this working field by practicing on my free will.

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