UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SECP1513-03 TECHNOLOGY AND INFORMATION SYSTEM

Proposal Topic: Home Automation System

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Introduction

We would like to introduce our App Averages HL Homes as an upcoming Smart Home Management System where all internet connected devices are linked to a central hub and can be operated remotely by using a smartphone application.

Identified problems and solutions

- **Problem: Insufficient features and functionality**
  - The existing home automation system needs multiple applications to control everything in our house which may cause cost inefficiency due to the purchase price of multiple applications and also very big data storage in our devices. This also causes some people to be confused easily since there are too many control apps to handle.
- **Solutions: to Inadequate performances**
  - Integrated platform: Design an all-in-one home automation platform that works with household appliance brands to integrate various devices into a single app, allowing users to control all their smart devices from a single interface.（For example, a control app）
  - Multifunctional applications: Ensure that home automation applications have a wide range of features, including timed tasks, scenario Settings, and custom rules to meet the different needs of users.

- **Problem: Compatibility with existing tools**
  - There may exist some older infrastructures in homes such as television, air conditioners and refrigerators which are not easily integrated into the home automation system. The limited standardization may cause redevelopment of older homes to accommodate smart devices.

❖ **Solutions : Compatibility**

- ➢ Adoption of common standards: Drive the adoption of common standards in the home automation industry to ensure seamless integration of devices from different brands and models.

❖ **Problem: Cost**

- ➢ Apps such as Philips Hue、Google Home might have different payment models and subscription services, requiring users to choose based on individual preferences.

❖ **Solution: Free subscription**

- ➢ The cost structure of our app better suits user needs and potentially offers more economical long-term usage costs.

❖ **Problems:Regional Adaptability**

- ➢ Applications such as Google Nest、Amazon Echo provides varying functionalities and services in different regions, with selected regional coverage possibly influenced by provider strategies.

❖ **Solution:Wider coverage**

- ➢ Our application might offer more specific features and a broader coverage range in certain regions.

❖ **Problems:Stability and Customisation**

- ➢ Wink、Xiaomi Mi Home also supports customization and adaptation, but scalability and compatibility might vary based on platforms and device types.

❖ **Solution:**

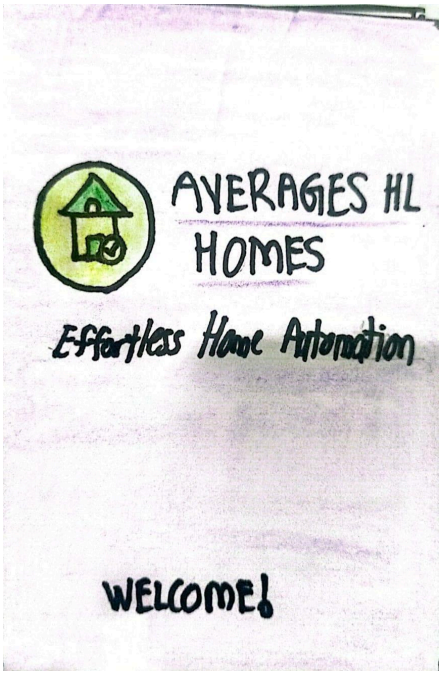
- ➢ *Automatic processing of network disconnection:* Increase the function of the device in the state of no network connection. If the Internet is interrupted, it can automatically operate according to the user's own habits to ensure that the device is carried out as usual, and no additional waste of resources will be generated.
- ➢ *Intelligent scheduling:* The intelligent scheduling system is introduced to optimize the use time of the equipment according to the habits and schedules of the family members, and the monitored energy consumption is summarized and reflected to the user, so that the user can better manage the high-energy equipment, reduce

the load of the system during peak hours, so as to improve stability and reduce energy consumption.

- As for customisation our application offers more functionalities for user customization and smart device adaptation, supporting third-party development.

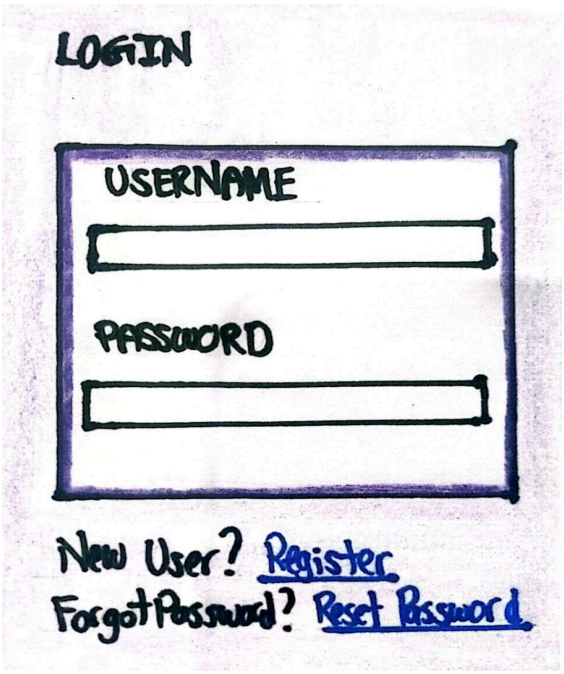
Detailed description of proposed product

Page 1



Main page

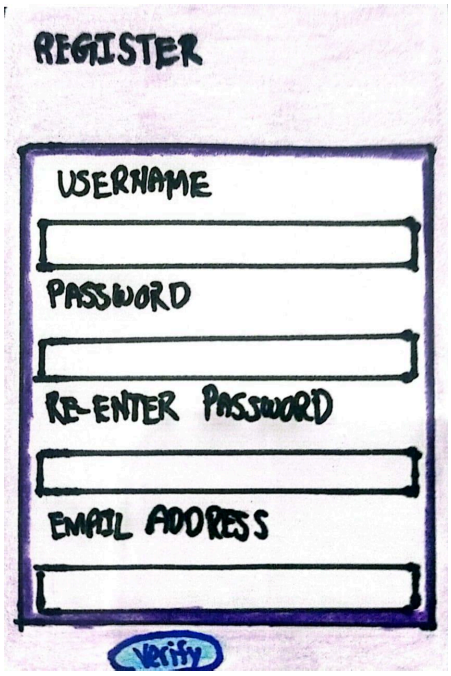
Page 2



Login page

Registered users are required to enter set username and password.

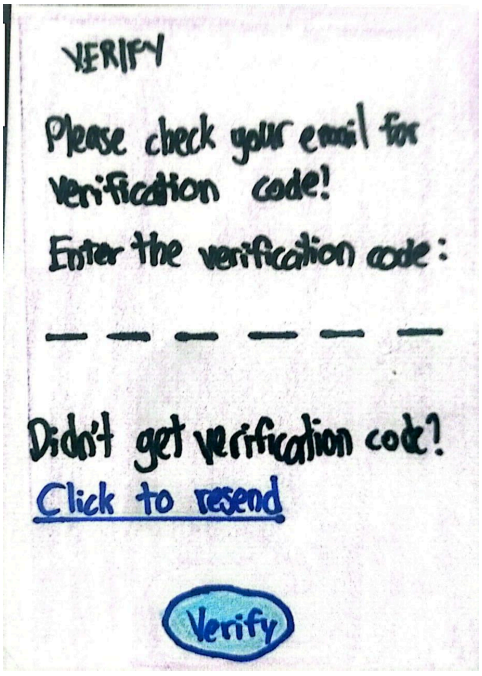
Page 3



Register page

New users are required to enter their personal details as per above.

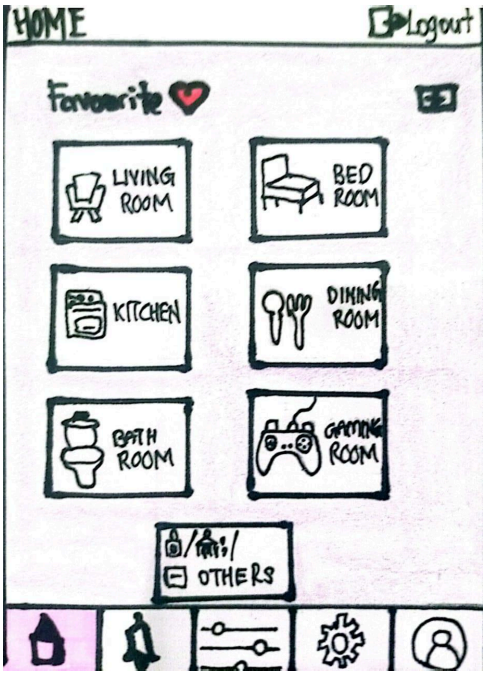
Page 4



Verification page

New users are required to verify their email address.

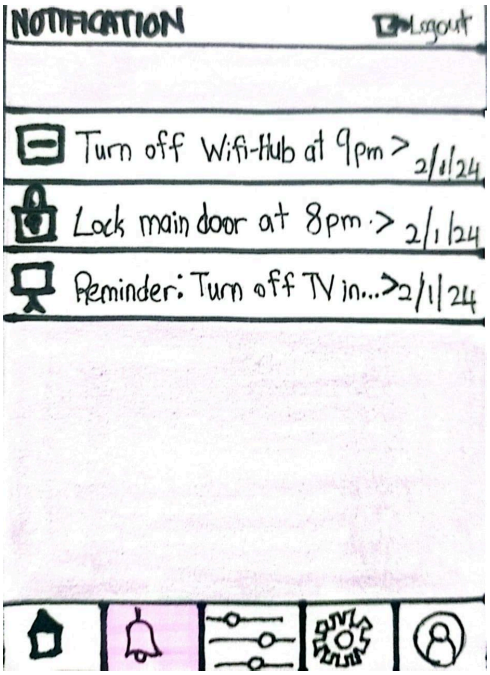
Page 5



Home page

Users may add the rooms available in their house in the "Favourites"

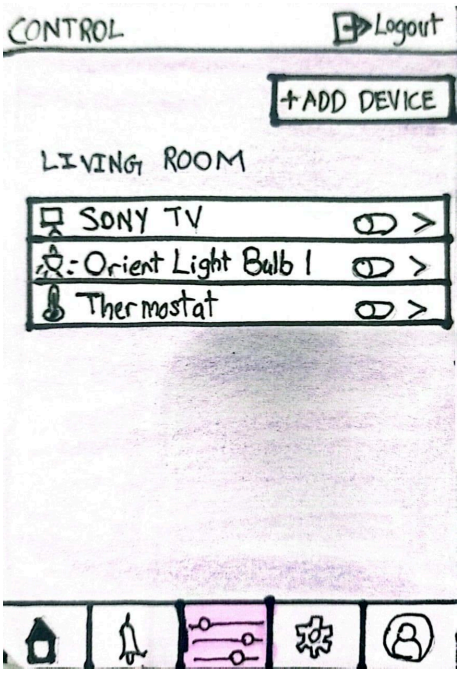
Page 6



Notification page

Users will be able to get notification from the app about the existing devices in their home.

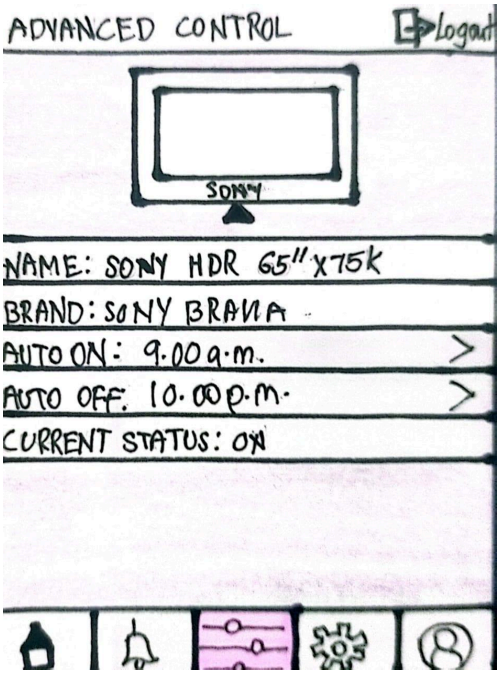
Page 7



Device Control page

Users may control the on/off state of multiple devices in a room at a same time

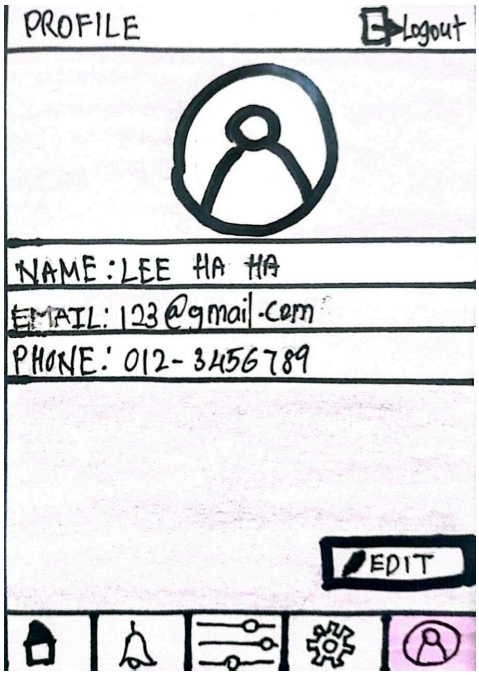
Page 8



Advanced Control page

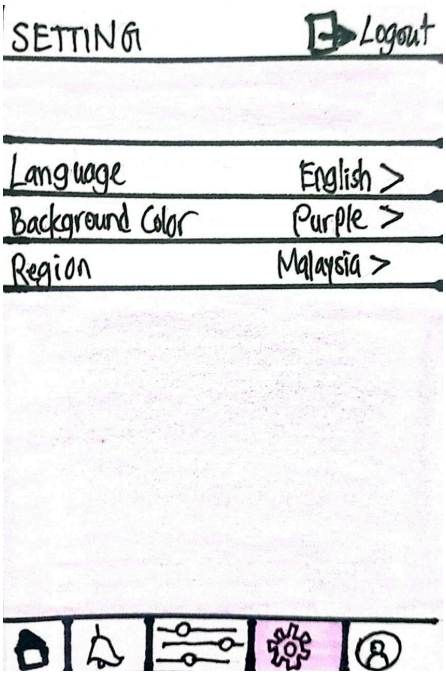
Here users can control a specified devices which is the timeline for each device

Page 9



User Profile page

Page 10



App Setting page

Frequently asked questions on our product

1) What we may do if there is no Wi-Fi connection or Mobile data?
    a) Users may set up auto-on/auto-off of devices earlier to avoid this issue to avoid this incident.
2) What are the main differences between your product and the current existing product?
    a) Our system combines all brands products and makes that all brands products can be accessed and controlled using our system.
    b) Our system has also been designed in a less complex way to make it lower cost in development and maintenance, and this can lead to the lower or no subscript fee for users.

Reflections by Individual Members

1. Vishali
    a. For a person pursuing a Computer Science course, I aspire to be a software developer, cybersecurity analyst, or a network engineer in future. Hence, I would like to increase my knowledge and skills on this course beforehand.
    b. In this design thinking I have increased my ability on problem-solving approaches that involves understanding users' needs, brainstorming creative solutions, prototyping, and iterating based on feedback. In the context of Computer Science, applying design thinking helped me to develop user-friendly software prototypes, and create innovative solutions. This mindset is valuable in any computer science career, as it promotes a holistic and user-focused approach to problem-solving.
    c. First of all I should always stay updated on the latest technologies which includes programming languages, and industry trends. Other than that, alongside technical skills, I have to work on improving my soft skills such as communication, teamwork, problem-solving, and adaptability which are much needed in a working environment.
2. Goh Jiale
    a. As a Computer Science student, I have had the opportunity to learn about IoT, and I am actively working to enhance my skills in this area. It is always important to continue learning and strive to deliver the best products is a crucial attitude for any Computer Science student.
    b. In the design thinking process, I've learned the importance of maintaining constant communication with our groupmates. Recognizing that one person's ideas and efforts are not sufficient to create a complete and effective system, collaboration becomes crucial. Low fidelity doesn't merely involve drawing screens; it requires identifying the optimal placement of functionalities and buttons to enhance user-friendliness. Overall, this experience has deepened my understanding of my future and has motivated me to further develop my Information Technology skills.
    c. In terms of teamwork, I've learned that communication is always the most crucial factor, regardless of the circumstances within a team. Additionally, I've realized the importance of being helpful and having the courage to ask questions continuously, contributing to the success and completeness of the product.
3. Leonard
    a. My goal regarding the course that I choose is to learn everything that this course has to offer and become a full fledged worker or develop my own business.
    b. This design thinking has taught me that no matter how perfect the product is , there is always a way to improve the product and the possibilities are infinite which can be a way for me to develop my own product in the near future.
    c. My plan is to start learning different kinds of languages and find which language I am interested in and start to broaden my knowledge in that language. Then I will start doing my own project and create a portfolio to showcase my skill . I should

also take note of how the technologies and security landscapes evolve so I can always adapt to the latest and keep up with it.

4. Aaron
    a. As a computer science student, I look forward to learning more about the Internet of Things, software development, and network security. This allows me to gain knowledge and skills that were not previously explored and deeply studied.
    b. Throughout this thought process, I've learned the comprehensive knowledge required to develop a program from start to finish, and I've gained an understanding of the sustainability of the Internet of Things in the future. Through this collaboration, I deeply appreciate the importance of teamwork. When faced with customer feedback, we can collectively brainstorm with team members, sometimes generating new ideas and solving encountered problems. The experience gained from this learning and collaboration is invaluable and will enable me to acquire more knowledge and skills in the field of computer science.
    c. In summary, I've learned the importance of empathy, as developing software is not just about coordinating with team members. We must also think from the user's perspective and experience to address many potential issues.
5. Haziq
    a. In the pursuit of my Computer Science education, I have cultivated a multifaceted skill set driven by a design thinking approach. Recognizing the importance of understanding users' needs, brainstorming creative solutions, and iterating based on feedback, I have applied this mindset to develop user-friendly software prototypes and innovative solutions.
    b. My ambition lies in becoming a versatile professional, with aspirations to excel as a software developer, cybersecurity analyst, or network engineer. I understand that staying at the forefront of the field requires continuous learning and keeping abreast of the latest technologies, programming languages, and industry trends. This commitment to staying updated serves as a foundation for my technical proficiency.
    c. Moreover, I recognize the indispensability of soft skills in the dynamic landscape of computer science careers. Effective communication, adept problem-solving, and adaptability are key pillars in navigating the complexities of a professional environment. I am actively honing these skills to complement my technical expertise, ensuring a holistic and user-focused approach to problem-solving in any role. As I progress in my Computer Science journey, I am poised to embrace the challenges and opportunities that come my way, armed with a strategic blend of technical and interpersonal skills.
6. Suyu
    a. As a student studying computer science, I aspire to become an excellent network engineer. This course improves my knowledge and skills, and I also hope to make myself better through continuous efforts.
    b. In this process of design thinking, through group collaboration, I developed the ability to innovate solutions. Emphasizing soft skills such as communication and teamwork, I recognize the importance of working with others in the design and

development process. Through close communication with team members, users and stakeholders, I was able to better understand the expectations and needs of all parties. This collaboration not only helps build more comprehensive solutions, but also increases the creativity and efficiency of the team.

c. In terms of teamwork, I feel honored to be in a team with the other five members of our team. I realize the importance of team unity and listen to different opinions of others, which further improves my thinking and enables us to achieve the team goal together.

Task Distribution

No	Member	Task
1.	VISHALI A/P MOGAN	● Team representative ● Prepared project report
2.	GOH JIALE	● Prepared design for prototype ● Prepare proposal report
3.	LEONARD LEE SUEN YU	● Prepared google form and Q&A
4.	AARON TAN YOONG THZEN	● Prepared prototype ● Prepare Data Analysis
5.	HAZIQ IRFAN BIN GHAZALI	● Searched for clients and respondents
6.	SU YU	● Team's photographer and videographer