



SECP1513 TECHNOLOGY AND INFORMATION SYSTEM

ASSIGNMENT : PROJECT DESIGN THINKING

SESSION 2025/2026 SEMESTER 1

SECTION 06

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1.0 INTRODUCTION

The **MEGA** project is a Design Thinking Project developed for the SECP1513 Technology and Information System course. The project focuses on creating a **smart household electricity usage tracking application** designed to help users monitor, analyse, and manage their power consumption more efficiently.

Currently, global energy security faces a critical challenge: the depletion of fossil fuels. As these fuels account for approximately **60% of the world's primary electricity source**, estimates suggest that current reserves may only last for another **100 years**. Our team recognised that without immediate intervention, humanity faces an imminent energy crisis. In response, we focused on finding a solution that maximises **prevention and conservation** to extend the availability of these resources and provide more time for a global transition to sustainable energy.

To bridge this gap, our team developed **MEGA**. Unlike traditional utility apps, MEGA serves as a proactive management tool that integrates directly with **Tenaga Nasional Berhad (TNB)** data to provide users with real-time insights. By leveraging the five stages of **Design Thinking**—Empathy, Define, Ideate, Prototype, and Test—we have created a solution that combines **human behavioural concepts** with **software engineering** to strongly motivate users to reduce their electricity consumption.

The application features a user-friendly dashboard, daily consumption breakdowns, and a unique **community-based ranking system** designed to foster a culture of energy conservation. Through MEGA, we aim to transform electricity saving from a mundane task into an engaging, rewarding, and socially connected experience, ultimately promoting a more sustainable lifestyle for all.

2.0 DETAILED STEPS AND DESCRIPTIONS

No.	Date	Phase	Description
1.	29 Nov	Empathy	<p>To understand the challenges users face with electricity management, our team conducted a Google Form survey amongst 20 respondents. The findings revealed that:</p> <ol style="list-style-type: none">1. Users lack awareness of their daily consumption patterns. Most users do not monitor their electricity usage regularly, with 75% of respondents tracking their consumption very infrequently. This makes it difficult for them to understand how their daily habits translate into costs.2. Tracking electricity usage is perceived as a complex and difficult task. 50% of users explicitly mentioned that they find it hard to keep track of their electricity consumption, while 30% remain uncertain. Without a user-friendly tool, many people feel disconnected from their energy usage data.3. Many users experience "bill shock" due to unexpected monthly costs. 55% of respondents frequently find that their electricity bills are higher than they anticipated. This frustration arises because users lack access to real-time data that could warn them of high usage before the bill arrives.4. High-consumption appliances are difficult to identify without detailed tracking. 55% of users are unsure which household appliances are responsible for the bulk of their electricity consumption. This information gap prevents users from making targeted adjustments to reduce their monthly wastage.5. There is a strong desire for digital solutions to manage energy. 70% of respondents expressed their willingness to adopt a mobile application for tracking, and 65% believe that real-time data would directly help them reduce their consumption.

			<p>After analyzing these user challenges, we have established the following objectives for our design thinking journey:</p> <ol style="list-style-type: none"> 1. Empowerment: Users should be provided with clear and accessible data to regain control over their household expenses. 2. Real-Time Monitoring: Developing the habit of checking consumption frequently helps prevent unexpected bill spikes. 3. Habit Transformation: Providing appliance-level insights encourages users to identify and reduce unnecessary energy waste.
2.	3 Dec	Define	<p>Through the various opinions collected, we can tell that:</p> <ol style="list-style-type: none"> 1. Most users don't know which household appliances are responsible for high electricity consumption. Appliances like air-conditioners, water heaters and refrigerators consume more power, but without detailed tracking, users cannot identify the main contributors. This makes it difficult for them to take action to reduce usage. 2. Electricity bills usually provide only a monthly total amount and overall consumption. They do not show daily usage patterns data. As a result, users cannot understand how their daily behaviour affects electricity consumption, making it hard to control or optimise usage. 3. Many users experience unexpected spikes in their electricity bills but are unable to determine the reason. This is due to the increasing appliance usage, faulty equipment or seasonal factors. Without proper information or monitoring tools, users are left confused and frustrated. 4. Electricity consumption is often unnoticed until the monthly bill arrives. Because of this issue, it is already too late to take action for that month. This lack of

			<p>real-time awareness prevents users from making timely adjustments to reduce electricity usage.</p> <p>Based on our understanding of their problems, we have drawn the motive of this design thinking process as follows:</p> <ol style="list-style-type: none"> 1. People should develop the habit of being conscious of their electricity consumption, such as turning off appliances when not using them and being aware that every device consumes power. Increasing awareness helps to prevent unnecessary wastage. 2. Users should have a positive attitude toward learning simple energy-saving practices, such as understanding which appliances consume more electricity or how to use energy-efficient settings. This knowledge allows them to make better decisions. 3. Reducing electricity consumption requires consistent effort and self-discipline, such as setting limits on air-conditioner usage or unplugging devices when not being used.
3.	8 Dec	Ideate	<p>When we all worked together, the team looked at ways to deal with the main problems that came up early in the project. This happened naturally because we already understood each other from before. The team used this shared understanding to come up with ideas and approaches to solve the core challenges of the project, and the team kept exploring different ways to tackle these core challenges.</p> <p>The exchange of ideas went forward. It covered several important things. The exchange of ideas had a lot of points that people talked about. People shared their thoughts on the exchange of ideas. It was very helpful. The exchange of ideas was discussed in detail. It was a great conversation.</p> <ol style="list-style-type: none"> 1. Brainstorming various concepts through group conversation, focusing on ways to improve understanding of electricity use and inspire more mindful energy habits.

			<p>2. Proposing the concept of a mobile application designed to present electricity usage information in a clear, visually intuitive, and easy-to-understand format.</p> <p>3. Suggesting a direct integration with Tenaga Nasional Berhad (TNB) to allow the automatic and accurate retrieval of monthly electricity consumption data.</p> <p>4. We have this idea for a system that compares people in a way that makes sense. It puts people into groups based on the kind of house they live in and who they live with. This system is called a comparison system. The goal of the comparison system is to make sure the comparisons are fair and relevant to each person. The contextual comparison system does this by grouping users with household types and residences together. This way, the contextual comparison system can provide benchmarks that are useful to each group of users.</p> <p>5. Discussing the inclusion of a supportive feedback and recognition mechanism to encourage users in their ongoing efforts to manage their electricity usage.</p> <p>After a thoughtful review of these discussions, weighing practical feasibility against potential user impact, the team arrived at a shared conclusion. The most effective and actionable solution appeared to be the development of an application integrated with TNB's data systems.</p>
4.	10 Dec	Prototype	<p>The mobile app that we are to create should have the following features:</p> <ol style="list-style-type: none"> 1. A simplified, detailed electricity usage statistics tab to inform the user of the electricity used. 2. A monthly ranking tab based on the electricity usage data. 3. An info banner displaying the reward for the future winners of the current month.

			4. Daily environment-related news on the main tab.
5.	31 Dec	Test	<p>Through intense hard work, our team developed the first version of the app. The early version of the app was put through beta testing. The testers were the family members of our team members. Our team had warmly accepted their criticism and feedback to improve the app even further. The following were the improvements made:</p> <ul style="list-style-type: none"> 1. Addition of small banners that showed more precise data on the electricity usage of a specific household item on the current day compared to the previous day. 2. Dark mode so it is easier to navigate around the app at night.

3.0 DETAILED DESCRIPTIONS (PROBLEM, SOLUTION AND TEAM WORKING)

3.1 Problem

Based on our observation, a significant number of people are unaware of their electricity consumption patterns and often pay higher electricity bills than expected. Nowadays, it is rare to see people actively monitoring their electricity usage or making conscious efforts to reduce it. This lack of awareness has gradually become a common issue these days.

This phenomenon arises due to the fast-paced and demanding lifestyle of people. Heavy commitments leave little time and energy to monitor and manage electricity usage. With limited attention and energy available, people often focus on more immediate or entertaining activities, such as scrolling through social media or using electronic devices for entertainment, rather than actively tracking or reducing electricity consumption, which requires deliberate attention and effort.

Through the Google Form data that we have collected, some people mentioned that they don't know how to monitor their electricity usage effectively or which appliances consume the most energy. Even though electricity bills are available, these bills only provide total monthly consumption and cost, which is not enough for people to understand their daily usage. As a result, a sudden rise in bills often comes as a surprise, and people struggle to identify the cause or take action.

Among people who try to reduce electricity usage, many find it difficult to maintain the habit due to a lack of motivation and community engagement. Monitoring electricity consumption is often seen as an individual task, unlike group activities such as sports or gaming, where peer interaction and shared goals help sustain participation. The absence of a supportive community, feedback or reminders makes it challenging for people to develop long-term energy-saving habits. Consequently, electricity wastage continues unnoticed until the arrival of the monthly bill, leaving people with little opportunity to make immediate adjustments.

3.2 Solution

We have come to the conclusion of designing an inclusive and multi-purpose application focused on electricity consumption awareness. This application should not just provide numbers or bills - it should be engaging and interactive, similar to a social media platform, connecting users across the university, country or even globally.

The application should have features that allow and encourage users to monitor their real-time electricity usage, track consumption patterns of individual appliances, and receive tips and challenges to save energy. Users should also be able to join communities or discussion groups, share their energy-saving achievements and exchange advice on reducing electricity wastage.

The main purpose of this application is to help users develop awareness of their electricity consumption, form energy-saving habits and feel motivated through peer interaction and shared goals. We also aim to make energy conservation an engaging and habitual part of daily life, bringing attention to the importance of sustainable electricity usage even in today's fast-paced, technology-driven era.

3.3 Team Working

The MEGA project was a success, and teamwork was a big part of it. Each person on the team had ideas and skills that they brought to the table. This really helped the team understand what they were trying to do and come up with a plan. The team worked together well. They talked to each other. Made sure everyone was on the same page. The MEGA project was about people working together, and the team did a great job of that. Teamwork and the MEGA project went hand in hand.

The project started with the team talking about the problems with electricity consumption. How people do not know much about energy usage. The team wanted to hear what every member thought, so everyone was able to share their thoughts without worrying about what others would think. This way, the team was able to look at the problem from different sides. Sometimes the team members did not agree. They were able to work things out by talking about it and finding a middle ground. The electricity consumption project team made decisions together, thinking about what would help them reach their goals with the electricity consumption project.

We divided tasks based on what each person is good at and what they like to do. Some people did research. Figured out what problems the users have. Other people worked on coming up with ideas and making the system better. They also prepared the presentation.

We had meetings all the time to talk about how things are going and what problems we are having. We made sure everyone knew what they had to do. When they had to do it.

This way of doing things really helped. We did not get confused about what we were supposed to be doing. The project got done quickly, and it was easier to do.

The MEGA project went well because the team worked together. This experience was good for the team members because they got better at talking to each other and working together. The MEGA project helped them learn to be flexible and get along with others. These skills are really important for the MEGA project team members when they do projects at school or at work, on the MEGA project.

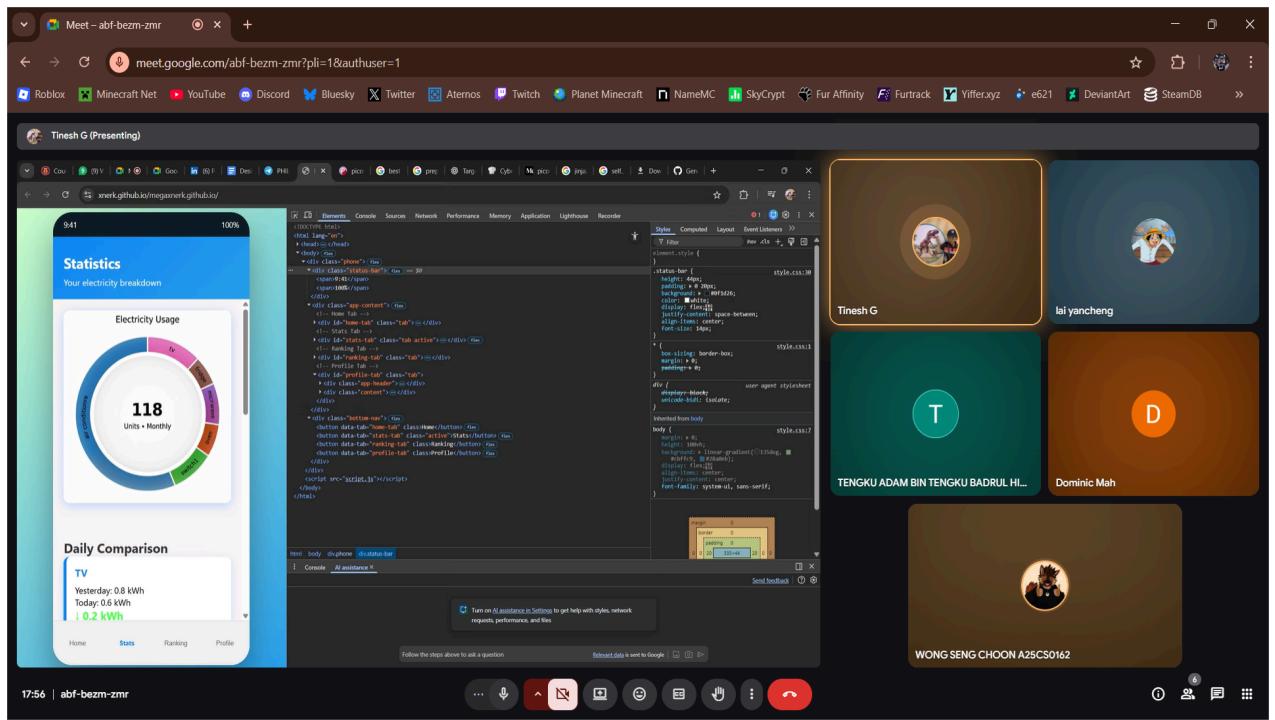


Figure 3.3.1 Team Working Evidence

4.0 DESIGN THINKING ASSESSMENT POINTS

The MEGA project used the design thinking approach that we learned about in the SECP1513 course. We did each part of the design thinking carefully. This way, we made sure that the solution we came up with would really help the users and make them change their behaviour for the better. The MEGA project team followed design thinking to make sure the solution was good for the users.

The team tried to figure out how people use electricity and how much they know about how much they use each month. They found out that a lot of people do not know whether they use a lot of electricity or a normal amount. People also think that their electricity bills are hard to understand and do not give them information. This makes people not want to try to save energy. The team learned a lot from this. Got a better idea of what the problem is, with electricity usage and the bills people get. The problem is that people do not understand their electricity usage and the electricity bills they get.

In the define phase, the team looked at the information they had collected and found the problem. The big issue was that people did not get useful information about how much electricity they were using. This was made worse by the way people behave if not thinking about how their actions affect the environment on the run, and not feeling like saving energy does them any good right now. When the team understood the problem of electricity usage clearly, it helped them figure out what to do to solve it. The problem of electricity usage was the thing they were trying to fix.

The team moved on to the phase. They came up with a lot of ideas to fix the problems they found. The team had meetings to talk about each idea and see if it would work. They wanted to know if each idea was a one.

The team thought a mobile application that worked with TNB was the way to go. This mobile application would give them the information. It would also make sure things were fair. Had features that would motivate people to use it. The mobile application was a choice because it would work well with TNB.

When we were making the version of this thing, we took the idea we liked and turned it into a plan for a system. This system had things like boards that showed how much electricity people were using, a way to group people together and a way to rank them. We made sure the design was simple and easy to understand. The goal was to make it easy for people to see how electricity they were using. We wanted

the electricity consumption to be clear to the users of the system, so they could understand their electricity consumption.

Finally, the test phase involved reviewing the proposed solution and reflecting on how effectively it could influence user behaviour. Feedback and reflections were used to identify areas for improvement. Overall, the design thinking assessment points ensured that the MEGA project followed a structured, user-centred approach.

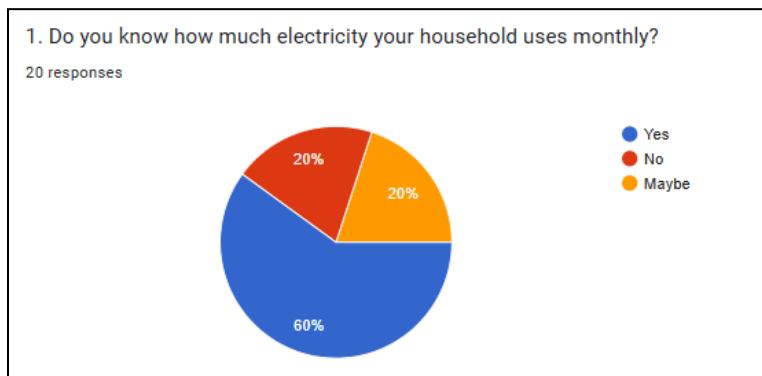
5.0 DESIGN THINKING EVIDENCE

5.1 Empathy

The empathy phase allowed our team to move beyond assumptions and understand the real-life frustrations users face regarding electricity management. By analysing 20 responses from our survey, we identified a significant gap between the users' desire to save money and their actual ability to monitor consumption.

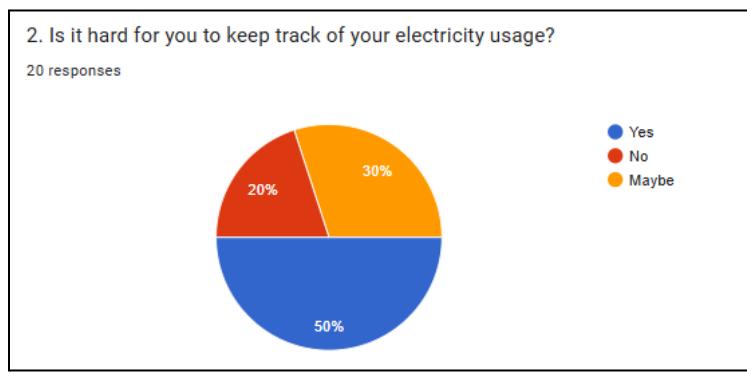
5.1.1 Understanding Current Usage

Question 1:



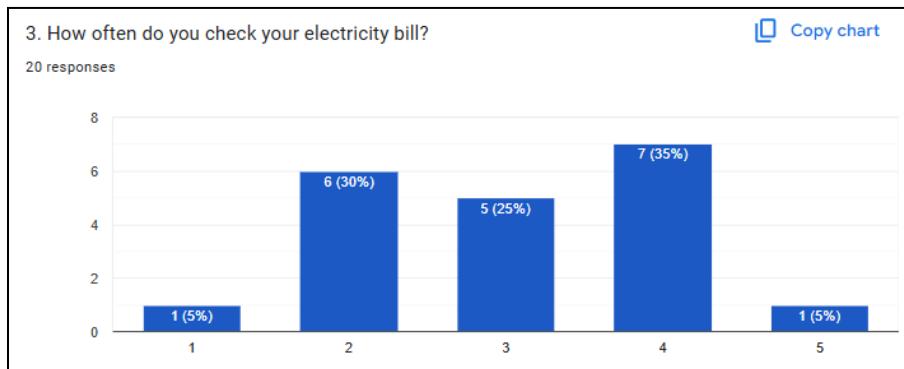
Based on our data, while 60% of respondents claim to have knowledge of their monthly consumption, a combined 40% are either unsure or completely unaware of their household's electricity usage levels. This highlights a significant lack of basic awareness among nearly half of the surveyed population.

Question 2:



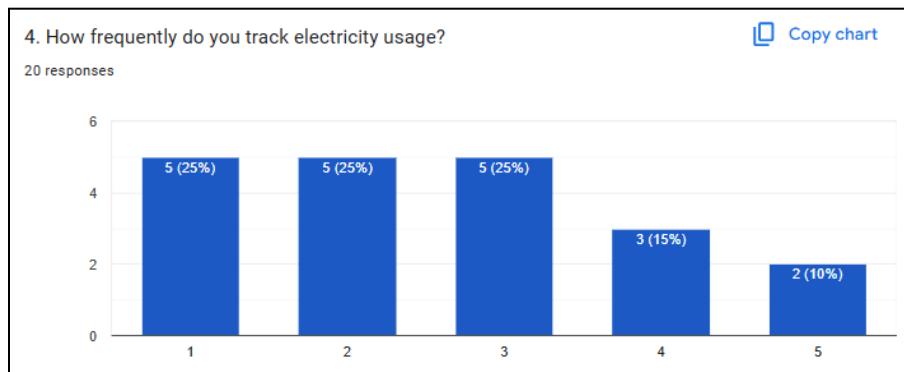
The survey reveals that 50% of users explicitly find it difficult to keep track of their electricity usage, while an additional 30% are uncertain. Only 20% of respondents find tracking easy, proving that existing methods are not user-friendly.

Question 3:



Most users interact with their billing data very infrequently. The majority of responses (65%) fall into the middle-to-low frequency categories, showing that users only look at their consumption data when it is time to pay, rather than for monitoring purposes.

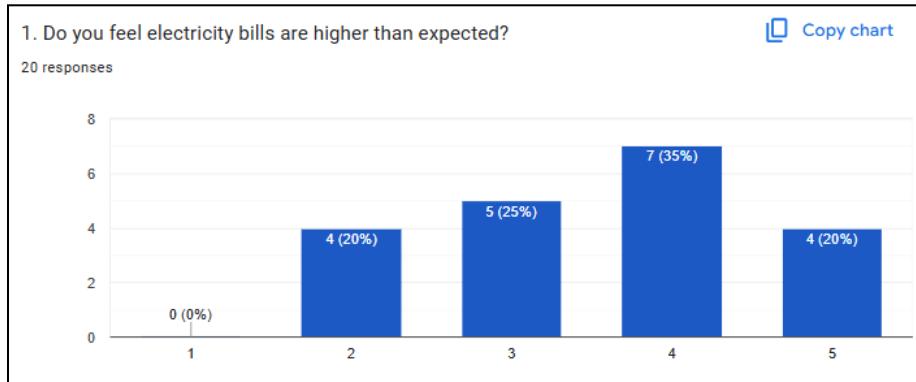
Question 4:



Real-time tracking habits are remarkably low; 75% of respondents rank their tracking frequency at a 3 or below on a 5-point scale. This confirms that monitoring is not a regular habit for most households, leading to a lack of control over consumption patterns.

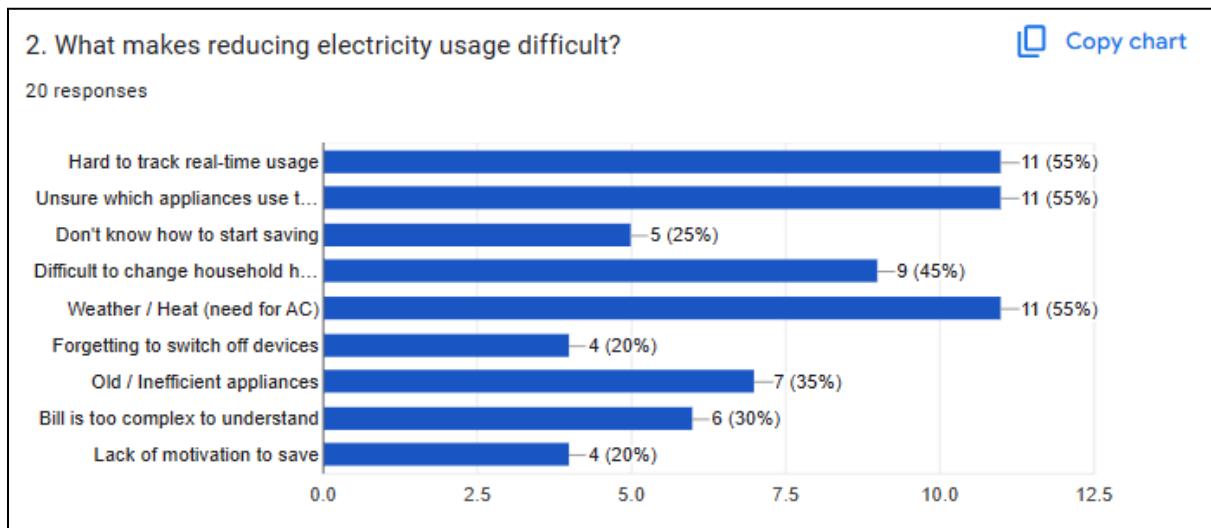
5.1.2 Challenges in Managing Consumption

Question 1:



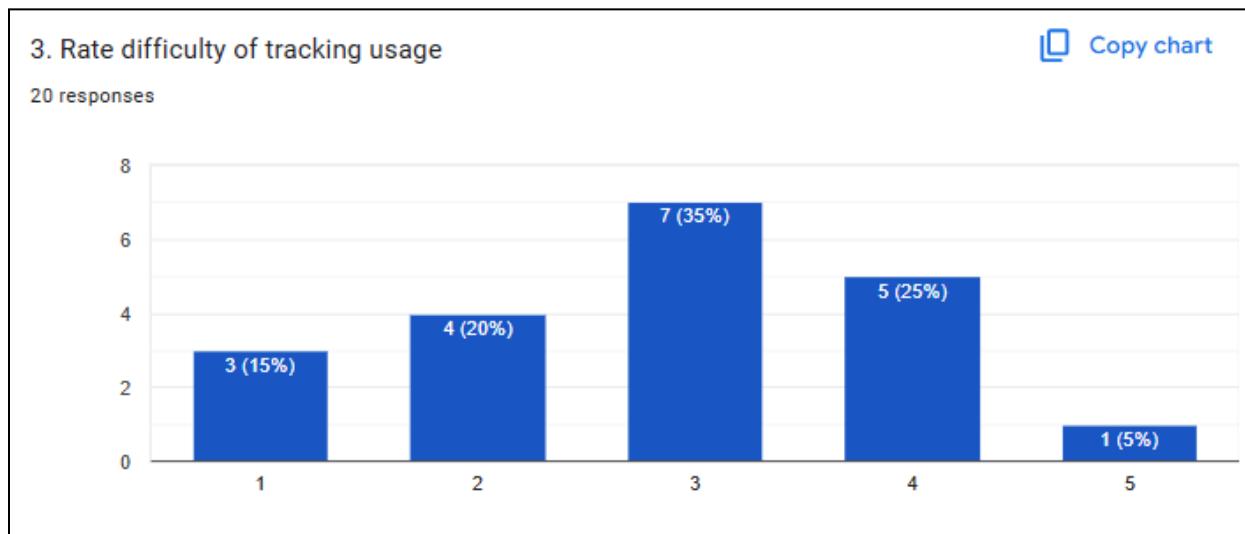
The "invisible" nature of electricity leads to consistent "bill shock," with 55% of respondents reporting that they frequently feel their electricity bills are higher than they anticipated.

Question 2:



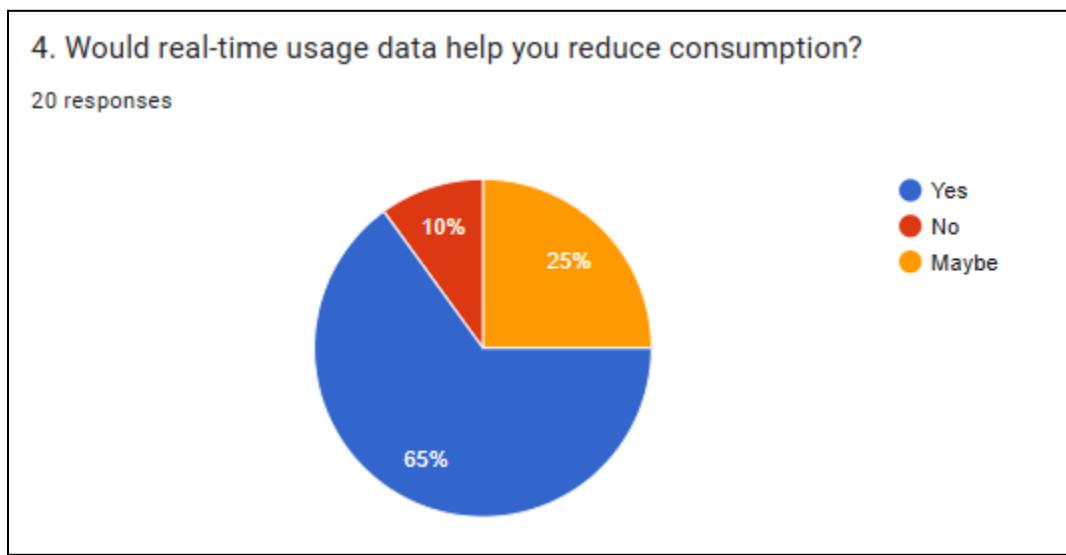
Users identified three primary obstacles (tied at 55% each): the inability to track real-time usage, uncertainty about which appliances consume the most power, and weather-related needs such as air conditioning. Additionally, 45% of users cited the difficulty of changing established household habits.

Question 3:



When asked to quantify the struggle, 65% of respondents rated the difficulty of tracking and managing their usage at a level 3 or higher, reinforcing the need for a simplified digital tool like MEGA.

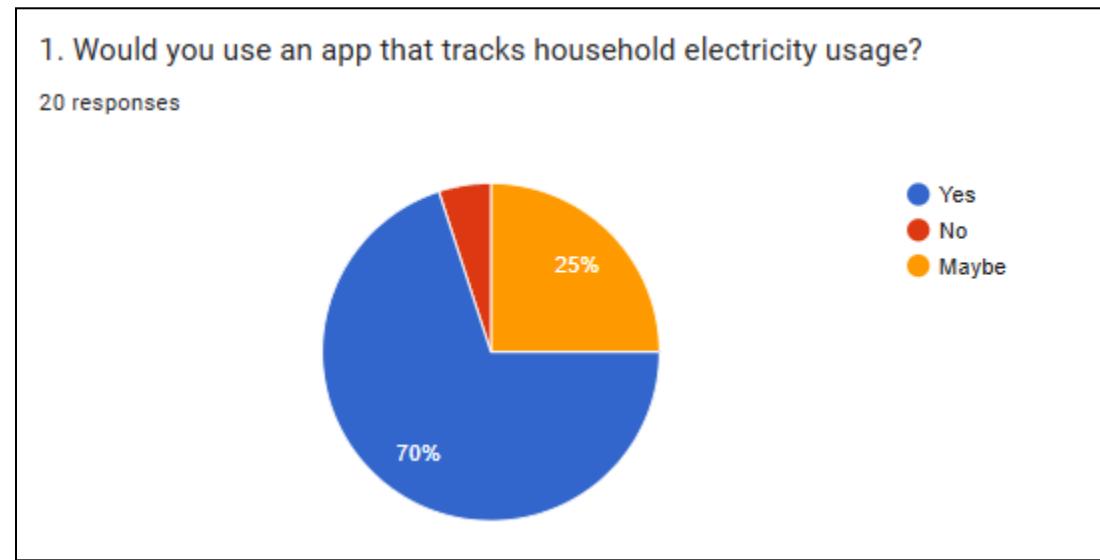
Question 4:



There is strong user consensus on the solution; 65% of respondents confirmed that having access to real-time usage data would directly empower them to reduce their consumption levels.

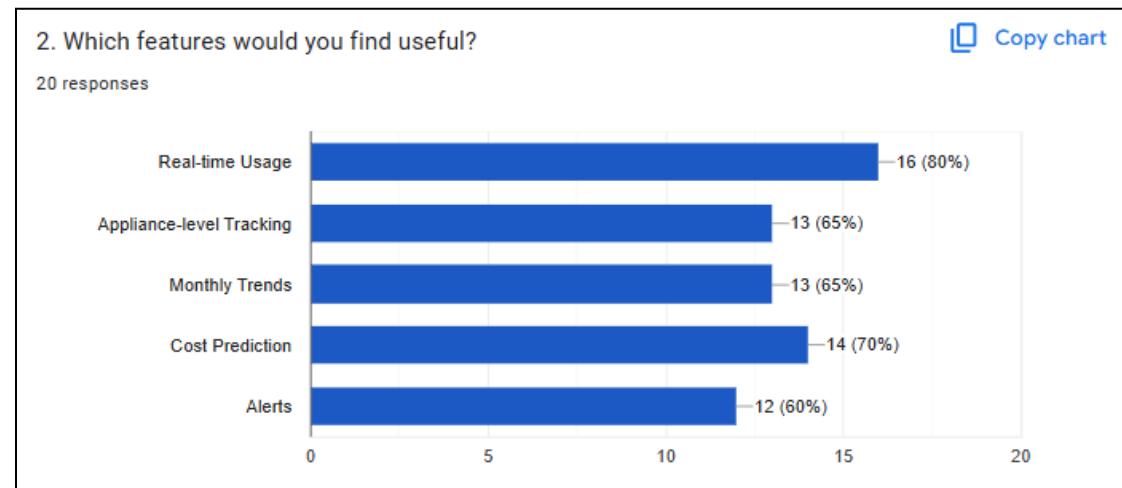
5.1.3 Features and Concepts

Question 1:



Market validation for the MEGA project is high, as 70% of respondents stated they would adopt a mobile application specifically designed to track their household's electricity usage.

Question 2:

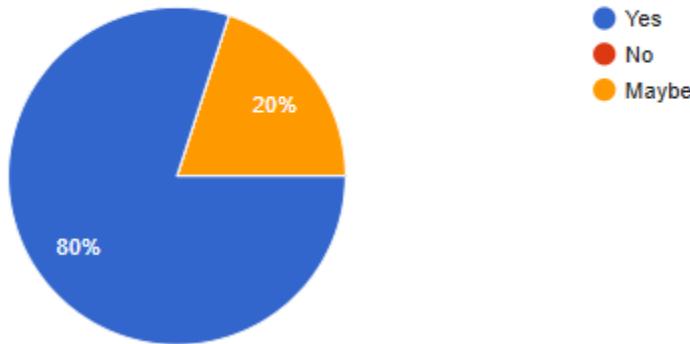


Users prioritised functionality that offers immediate insight. 80% of respondents identified Real-time Usage as the most useful feature, followed by Cost Prediction (70%), Appliance-level Tracking (65%), and Monthly Trends (65%).

Question 3:

3. Would you like to learn more about saving electricity daily?

20 responses



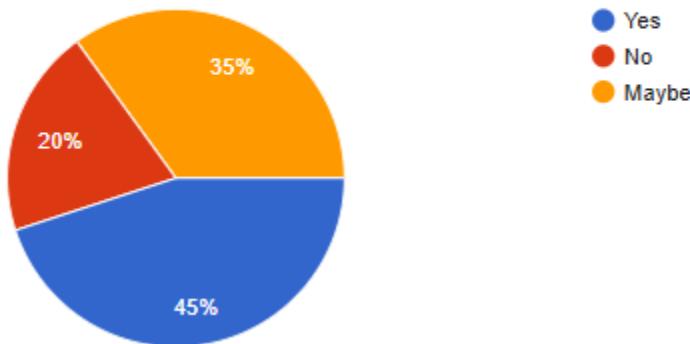
A vast majority (80%) of users expressed a clear interest in educational content, wanting to learn more about how to save electricity on a daily basis to improve their habits.

5.1.4 Additional Features

Question 1:

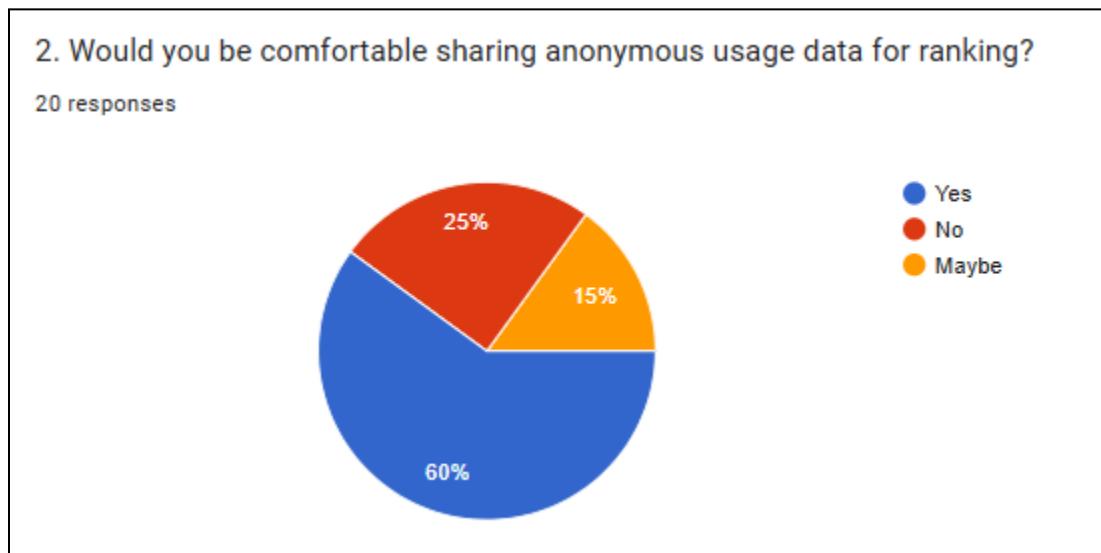
1. Would a neighborhood ranking motivate you to reduce electricity use?

20 responses



Social motivation is a viable strategy, with 45% of users stating a neighbourhood ranking would motivate them and another 35% being open to the idea.

Question 2:



Despite privacy concerns, users are willing to participate in a community-driven system. Between 60% and 65% of respondents expressed comfort in sharing anonymous data to facilitate a ranking system.

Question 3:



Tangible financial incentives are the strongest motivators. An overwhelming 95% of users prefer bill discounts, while 70% favour vouchers. This data directly influenced our decision to include a rewards mechanism in the prototype.

5.2 Define

We are aware of the variety of obstacles faced by different individuals, and by collecting their ideas and opinions, we have defined the details behind the issue discussed as follows:

1. No clear breakdown of which appliances consume the most electricity
2. Monthly bills only show total cost, not daily or appliance-level usage
3. A sudden increase in bills without understanding the cause
4. Seasonal usage (hot weather, air-conditioning) is not clearly reflected
5. Users only realise the problem after receiving the bill
6. Limited knowledge on how to reduce usage effectively
7. Lack of awareness of electricity usage

5.3 Ideate

The team came up with a lot of ideas during the ideation phase to solve the problems they found earlier. They talked about these ideas in a group, thinking about whether they would work if people liked them and if they would make a big difference in the long run. The team looked at the ideas of the team carefully. Made them better before turning them into real solutions for the problems. The team made sure the ideas of the team were good and would work well.

No.	Problem	Solution(s)
1.	Users are unaware of their electricity consumption level	Display monthly electricity usage using clear graphs and trends
2.	Electricity bills are difficult to understand	Provide a simple and user-friendly dashboard
3.	Lack of motivation to save electricity	Introduce a ranking system (Gold, Silver, Bronze)
4.	Saving electricity feels unrewarding	Offer incentives such as vouchers
5.	Unfair comparison between different households	Group users based on residential type and household status
6.	Environmental impact feels distant	Provide monthly feedback and comparisons
7.	Difficulty maintaining energy-saving habits	Track electricity usage over time

Based on the ideas generated, the team decided to develop an application integrated with TNB that focuses on monitoring electricity usage and motivating users to reduce consumption. This solution was selected because it combines awareness, fair comparison, and rewards in one platform. By providing clear information and incentives, the MEGA application is expected to encourage users to develop better electricity-saving habits in a practical and engaging manner.

5.4 Prototype

After deciding on a possible solution, we moved on to the next phase of our problem, the Design phase. This was where we, as a team, had to plan and decide on the features of our system. Even before that, how will the user access our system? Through discussions, we made a bold decision to design a mobile app. This was solely because of the fact that an app can reach its targeted users easily and on a larger scale due to the widespread use of smartphones. This was something that we had learned in our course, Technology and Information Systems. We had decided to use Flutter, an open-source UI software development kit (SDK) and framework for the final version of the app due to how beginner-friendly the mobile development of the SDK is. However, regarding the early prototype version of the app that we had developed, we used HTML, CSS, and JavaScript to develop a prototype web application that simulates our final version of the app. This approach was the best approach, as we can observe the deployed app's performance without the need to spend a lot of time developing a final version of the app immediately, meaning that this was nothing but excellent risk management by our team.

The following link redirects you to the prototype web application that our team has developed:

<https://xnerk.github.io/megaxnerk.github.io/>

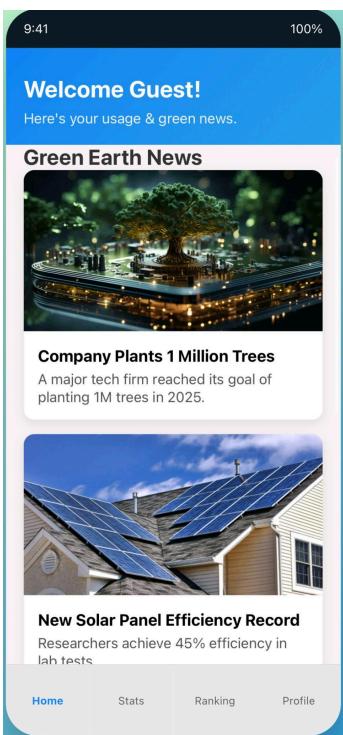


Figure 5.4.1 Welcoming page

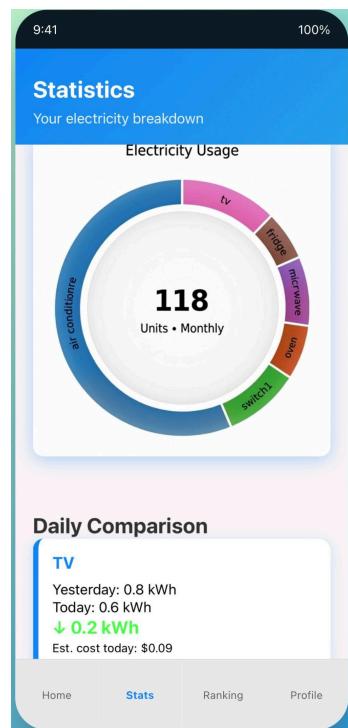


Figure 5.4.2 Electricity Consumption Dashboard



Figure 5.4.3 Leaderboard

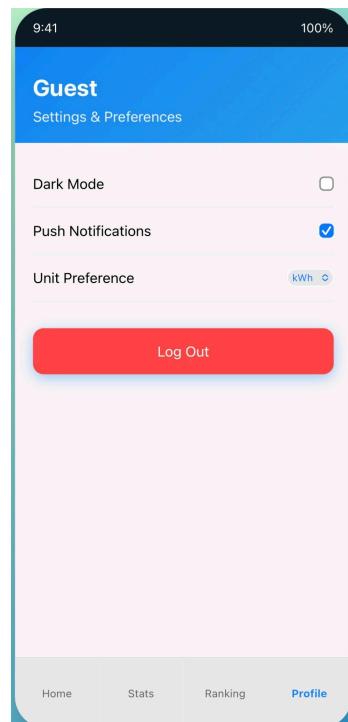


Figure 5.4.4 Profile page

5.5 Test

Before deploying it for beta testing, our app had the features below:

Feature	Reason
Electricity Usage Statistics	To enable the user to view and keep track of the user's electricity usage
Monthly Ranking Tab	A ranking system to properly rank users based on their electricity usage. The top 3 are carefully selected based on their lowest electricity usage.
Reward Info Banner	Motivates users to save electricity in order to climb the ranking to earn rewards
Daily Environment-related News	Slowly educates users by exposing them to news and articles regarding maintenance and conservation efforts.

After this, our team members had deployed the app for beta testing. The testers were our team members' own family members, parents, to be precise. The identities of our testers are kept anonymous for privacy reasons. The following are the evidence and the changes that we added to our app:

New Feature	Reason
Addition of small banners that show more precise data regarding specific household items and the comparison between their current day electricity usage and that from the day before(for houses containing smart home systems)	Compatible with smart home systems and enables users to keep track of their household items' electricity usage with high precision
Dark mode switch	Enables users to operate the app at night or in dark areas without straining their eyes.

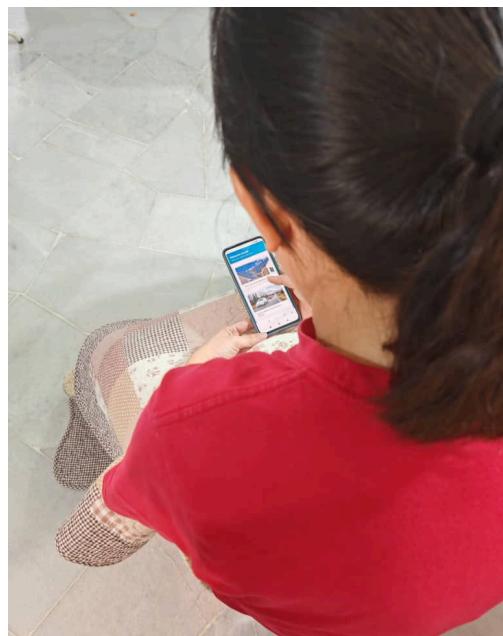


Figure 5.5.1 Tester 1

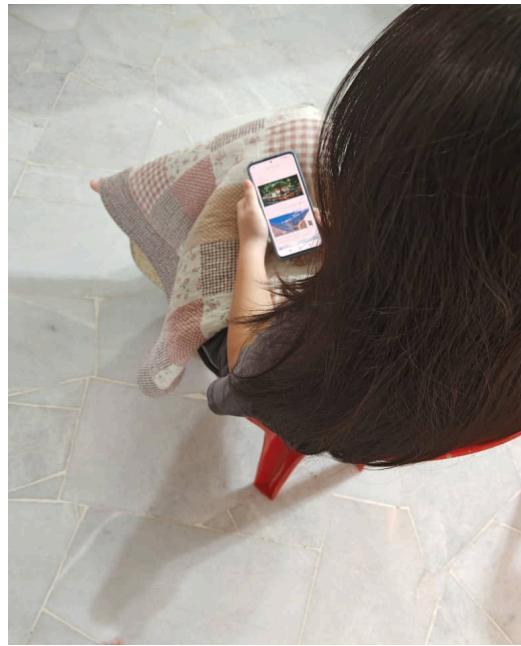


Figure 5.5.2 Tester 2

6.0 REFLECTION

TINESH A/L GAJENDRA BAHADUR:

1. Personally, I have always been interested in computers and tech. By undertaking this course, I wish to become a skilled cybersecurity specialist who can design and maintain reliable systems. I aim to use the knowledge gained in the Technology and Information Systems course for a good cause.
2. Design thinking has helped me understand the importance of apps and their security. Software is designed mainly for the purpose of making lives easier; it is our job to protect the system within these software from people who have malicious intentions. By protecting these systems, we protect people. Design thinking has also encouraged me to understand real-world problems, analyse risks, test solutions and constantly improve systems.
3. In order for me to improve my potential in the industry, I plan on strengthening my hands-on skills by taking courses online. I will also pursue relevant certifications, such as CCNA, and stay updated on cyber threats. Lastly, I will make sure to participate in labs, projects and capture-the-flag(CTF) challenges.

TENGKU ADAM BIN TENGKU BADRUL HISAM:

1. The intention that drives me to pursue this course, program, and eventually a degree, is the ability to solve problems in a manner that applies to real-life scenarios. The use of technology to develop solutions that are feasible, effective, and beneficial to society is my intention. The end plan would involve working in the tech industry, creating solutions for applications that enhance the function of the systems that affect everyday living.
2. This project of design thinking has aided me in understanding how I should process problems in an organised and user-centric fashion. From the MEGA project, I have understood that the application of technology should not be restricted to the technical realm but should include the behaviour of mankind and the real demands of the user. Both the empathy and ideation parts of the process enabled me to understand the problem from the point of view of the users, and teamwork enabled me to enhance my skills of communication and collaboration.
3. In order to continue to move forward, I would like to concentrate on a few key areas. First, I would like to continue to find opportunities to expand my learning, whether through hands-on projects or workshops, in order to develop my technical and collaborative abilities. Secondly, I would like to work on verbalising my ideas in a clear and concise fashion, in writing and in group setting situations, because excellent communication is what allows great ideas to be made into group solutions. Thirdly and most importantly, I would like to continue to be curious and apply this approach to everything that I do.

DOMINIC MAH YU QIAO:

1. My goal with regard to Technology and Information Systems is to equip myself with IT knowledge and apply it to design technology-based solutions that can solve real-world problems. I am interested in using technology not just to build systems, but to help people and address everyday issues faced by society. Through this program, I hope to develop strong technical and problem-solving skills that will allow me to contribute to improving efficiency and quality of life in the community.
2. Design thinking allows me to apply my creativity to design solutions that solve real-world problems. Through the design thinking process, I have learned the five stages used to develop effective solutions, which are empathy, define, ideate, prototype, and test. Empathy allows us to understand the problems faced by users. Define means identifying the main problem after understanding users' needs. Ideate refers to generating ideas to solve the problem. Prototype means building the solution, while testing involves checking with users whether the solution successfully solves their problems. Through understanding design thinking, I was able to create MEGA, which helps people track their household electricity usage and encourages them to save electricity in order to protect the environment. This experience showed me how design thinking can turn ideas into practical solutions and strengthened my confidence in designing technology-based systems.
3. I believe the skill I need to improve the most is communication, for two main reasons. First, effective communication helps me better understand users' problems and enables me to design more effective solutions. Second, good communication ensures that the solution development process runs smoothly and successfully. This is because solutions are usually developed in teams, and the tasks involved are too large to be completed alone. Therefore, effective communication is essential to ensure that an ideal solution can be built. In addition, another skill I need to improve is the ability to use AI to increase efficiency. Nowadays, AI is rapidly developing, and it is important to keep up with the latest advancements to avoid being left behind. Mastering the use of AI can help me complete tasks more efficiently, especially repetitive tasks. However, it is still important to have a strong foundation in fundamental knowledge related to my field and not rely too heavily on AI.

LAI YAN CHENG:

1. My drive to pursue this degree is rooted in the desire to solve real-world problems through technology that is feasible, effective, and socially beneficial. My ultimate goal is to work within the tech industry, developing applications that enhance the systems governing our everyday lives. Rather than viewing technology as a standalone tool, I see it as a means to create solutions that directly improve human experiences and societal functions.
2. The MEGA project and the principles of design thinking have been instrumental in reshaping my approach to problem-solving. I have learned that technical execution must be balanced with an understanding of human behaviour and the actual demands of the user. By engaging in the empathy and ideation phases, I've learned to view challenges from the user's perspective, while collaborative teamwork has sharpened my ability to communicate and build solutions alongside others. This shift from a purely technical mindset to a user-centric one is now the foundation of my creative process.
3. For now, I am committed to a three-part plan for my professional growth. First, I will seek out hands-on projects and workshops to continuously bridge the gap between my technical skills and collaborative abilities. Second, I will focus on verbalising my ideas with greater clarity and conciseness, ensuring that my contributions can be easily understood and adopted by a team. Finally, I intend to apply a sense of radical curiosity to everything I do, ensuring that I never stop asking the questions that lead to meaningful innovation in the tech industry.

WONG SENG CHOON:

1. My primary motivation for embarking on this academic journey in Technology and Information Systems is the desire to master the intersection between human logic and digital efficiency. I believe that technology should serve as a bridge that simplifies complex everyday tasks, making data more accessible and actionable for the general public. My ultimate goal is to become a versatile tech professional who can design systems that are not only high-performing but also deeply intuitive and socially responsible.
2. Participating in the MEGA project has been a transformative learning experience regarding the Design Thinking framework. I have realized that a successful technological solution is not built on code alone, but on a foundation of genuine empathy for the user's struggles. Moving through the stages of defining the problem and ideating features like real-time tracking has taught me that innovation often comes from looking at "boring" problems - like electricity bills, through a fresh, creative lens. This project has also highlighted the importance of a multidisciplinary approach, where diverse perspectives within a team lead to a more robust and refined final prototype.
3. Looking ahead, I have identified several areas for my own personal and professional development. First, I aim to enhance my technical literacy in data visualization, as I saw firsthand how clear graphs can change a user's understanding of their own habits. Second, I want to refine my ability to work under pressure in a team environment, ensuring that I can contribute effectively even when timelines are tight. Finally, I will strive to maintain a mindset of lifelong learning, staying open to new methodologies and tools that can help me solve the ever-evolving challenges of the modern world.

7.0 CONCLUSION

Throughout our design thinking project, we gained valuable experience in developing software by following proper SDLC and design thinking processes. This project also strengthened our ability to work effectively in a team, improving our communication skills and our ability to accept and apply feedback constructively.

The development of the ranking system allowed us to explore aspects of psychology and human nature, helping us better understand user motivation and engagement. This made the project both educational and enjoyable for us.

Overall, our main goal was to create an application that could bring about a positive impact on the environment. This shared purpose motivated us throughout the project and guided our design and development decisions.

8.0 TASK DISTRIBUTION

Name	Tasks
TINESH A/L GAJENDRA BAHADUR	Programming for prototype and testing the prototype. Analysis for prototype and test.
TENGKU ADAM BIN TENGKU BADRUL HISAM	Team working, design thinking assessment points and ideate Teamwork analysis and design thinking assessment points evaluation.
DOMINIC MAH YU QIAO	Video editing and design prototype
LAI YAN CHENG	Analysis for problem, solution and definition part, making slide presentation
WONG SENG CHOON	Introduction, analysis for google form survey and empathy process.

9.0 REFERENCE

Castro, V., Georgiou, M., Jackson, T., Hodgkinson, I. R., Jackson, L., & Lockwood, S. (2024). Digital data demand and renewable energy limits: Forecasting the impacts on global electricity supply and sustainability. Energy Policy, 195, 114404. <https://doi.org/10.1016/j.enpol.2024.114404>

Holechek, J., Geli, H. M. E., Sawalhah, M. N., & Valdez, R. (2022). A global assessment: Can renewable energy replace fossil fuels by 2050? Sustainability, 14(8), 4792. <https://doi.org/10.3390/su14084792>

Dumas, J., Dubois, A., Thiran, P., Jacques, P., Contino, F., Cornélusse, B., & Limpens, G. (2022). The energy return on investment of whole energy systems: Application to Belgium. arXiv. <https://arxiv.org/abs/2205.06727>

Ainslie, G. (1975). Specious reward: A behavioral theory of impulsiveness and impulse control. Psychological Bulletin, 82(4), 463–496. <https://doi.org/10.1037/h0076860>