SECP1513 – TECHNOLOGY AND INFORMATION SYSTEM (SECTION 07)

SEMESTER 1 – SESSION 2023 / 2024

DESIGN THINKING (GROUP 6)

TITLE :

NETWORK ANALYSIS : FIND YOUR NETWORK

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DATE OF SUBMISSION : 25 JANUARI 2024

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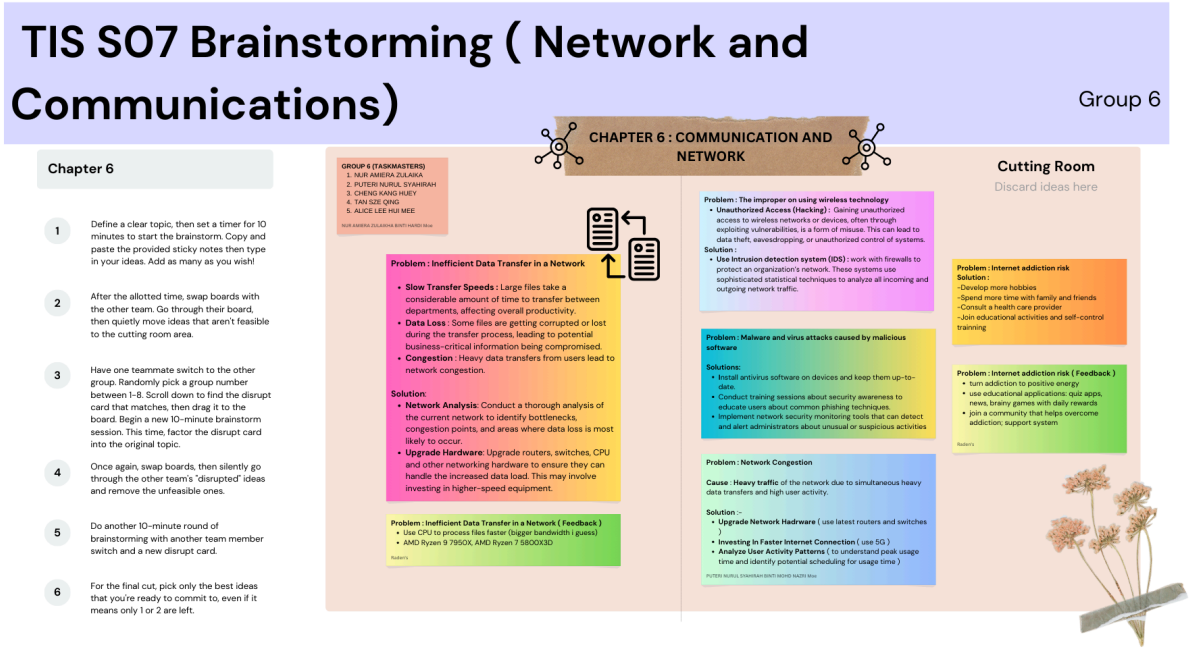
1.0 INTRODUCTION

Chapter 6 is about networks and communications which plays an important role in our daily routine. Undoubtedly, we all live in a fully connected society in which people are allowed to interact with each other using all kinds of electronic gadgets without the restrictions of distance and physical barriers. Basically, computer communications refer to the process of sharing data, programs and information among two or more computers. Operation of several applications depend on communication systems, like E-mail and video conferencing. Thus, we can see that connectivity is the key to link our personal computers to other resources by using computer networks.

Furthermore, a network is a communication system which connects two or more computers for the purpose of exchanging information and sharing resources. There are many trends in network technology which keep evolving in recent years, for instance cloud computing, artificial intelligence (AI) and digital transformation. Thus, it is undeniable that increasing connectivity potentially increases productivity.

From chapter 6, our group comes out with a related problem which is inefficient data transfer. People may face the problem of slow data transfer due to several factors like network performance, storage performance and packet loss. In this project, we discuss mainly network performance. In our daily life, we may notice that sending messages requires more time. This is due to the reasons of network latency and network congestion. The time taken to transfer data is longer when the number of network devices that have to be crossed is high or the saturation of a path used by packets to flow between the source and the destination is high. Consequently, this may cause inefficient data transfer that will bring some negative effects such as low productivity, data integration issues and missed opportunities.

2.0 DESIGN THINKING



The brainstorming process helps us to identify problems related to our chapter, which is Network and Communications. After discussing with our group members, we have decided on the problem which is inefficient data transfer in a network.

PROBLEM	SOLUTION
Inefficient Data Transfer in a Network • **Slow Transfer Speeds** : Large files take a considerable amount of time to transfer between departments, affecting overall productivity. • **Data Loss** : Some files are getting corrupted or lost during the transfer process, leading to potential business-critical information being compromised. • **Congestion** : Heavy data transfers from users lead to network congestion.	• **Network Analysis** : Conduct a thorough analysis of the current network to identify bottlenecks, congestion points, and areas where data loss is most likely to occur. • **Upgrade Hardware** : Upgrade routers, switches, CPU and other networking hardware to ensure they can handle the increased data load. This may involve investing in higher-speed equipment**.**

3.0 DETAIL DESCRIPTION

3.1 PROBLEM	Network is now an indispensable part of our daily lives. People use it for communications, entertainment, and even in business operations. The increased usage of the network has given rise to a bothersome problem, which is network congestion. As many devices connect to the same local network in their area to exchange data at the same time, the limited bandwidth of the network can cause speeds of data transfer to be decreased. Certain points in a network can also become a bottleneck if there is a high traffic passing through them. It is important for us to address this issue as it affects all levels of people in a society, especially students. They rely on networks to communicate with their peers, complete and turn in assignments, and learn through online classes. Without a reliable and functioning network, their educational progress can be easily hindered and many problems can stem from it.
3.2 SOLUTION	To address the issue of network congestion and ensure a reliable network experience for users, we propose the development of an innovative mobile application named 'Network Analysis : Find Your Network'. This app aims to empower users to identify network strengths and weaknesses in real-time, providing valuable insights for optimizing connectivity. Users can access the map to identify optimal locations for network usage, helping them make informed decisions about where to connect for the best performance. Additionally, it includes a built-in speed test feature that allows users to measure the actual data transfer speeds at any given location.

3.3 TEAM WORKING	On 18 January and 23 January 2024, our group had gathered together to share and compile our ideas on our design thinking project. At the first gathering, we identified our target problem and prototype that we will make. We have also allocated tasks to every member so that the design thinking process can go efficiently. At the second gathering, we finalized and double checked every member's part to make sure that our project is complete. The efforts and contributions of each team member reflects our commitment to achieving excellence in the pursuit of innovative solutions to inefficient data transfer in a network. 

4.0 DESIGN THINKING EVIDENCE

4.1 EMPATHY

We have conducted an interview towards two students in UTM to better understand their views and feelings towards inefficient data transfer in UTM. Through the interview, we have gained insights on the causes and solutions of network congestion. Ngeow Zhi Yu, a Year 1 student from KTDI reported that she has experienced slow network when watching videos in the dormitory. She suggested that it may be caused by the high data traffic and limited data bandwidth in the area.

Our next interviewee is Yong Jing Wen, a Year 1 student from KTHO. When asked whether she had ever faced a problem with network congestion before, Jing Wen recalled an incident related to submitting her assignment online. To solve this issue, she relocated to a less crowded area, where she found a noticeable improvement in network performance. This highlights the need for strategies to mitigate localized congestion issues within the UTM area, emphasizing the importance of addressing these challenges for the efficiency of data transfer.

4.2 DEFINE

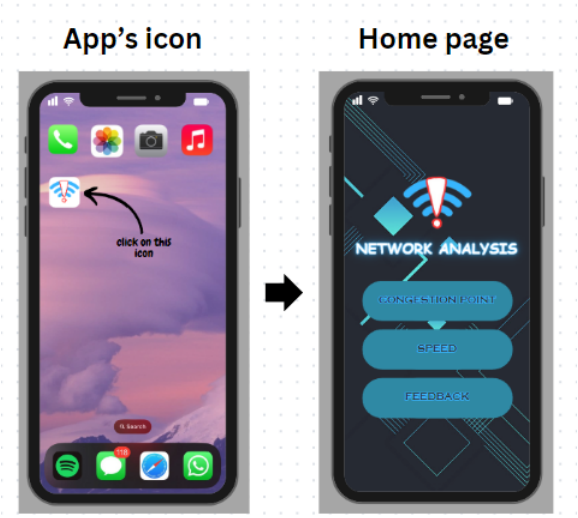
This network analysis mobile application is designed to minimize inefficient data transfer for the users. The users are allowed to identify the network congestion point and also the speed of the network at certain locations by using this application. These purposes can be achieved just by choosing a targeted location in the search box. Then, the application would conduct a thorough analysis of the current network to identify the network congestion points and the network's speed. Moreover, this application creates a platform for the users to provide their feedback in order to improve its performance. In short, it potentially minimizes the occurrence of inefficient data transfer since the users are able to determine the network congestion points earlier and choose another place with no network congestion to transfer their data.

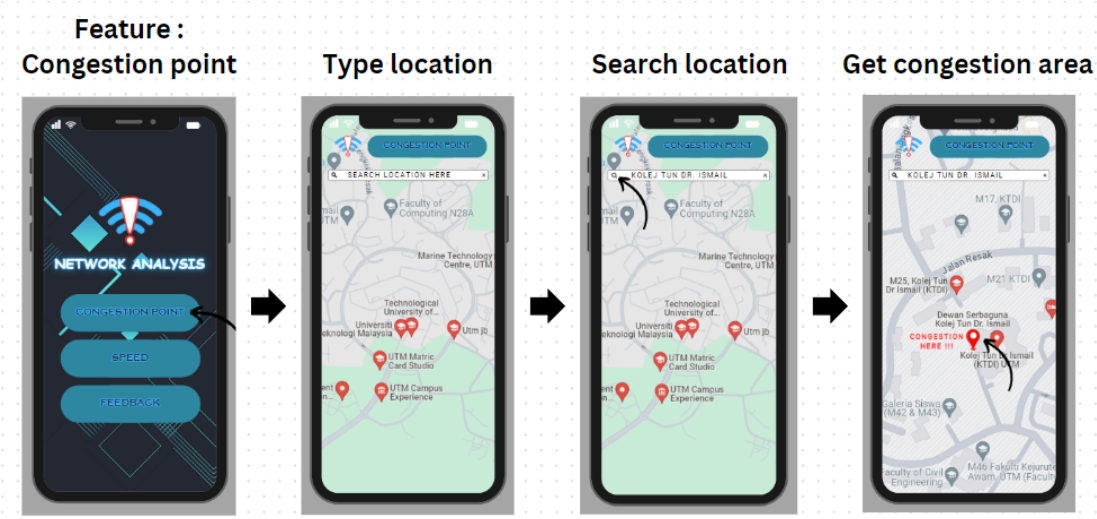
4.3 IDEATE

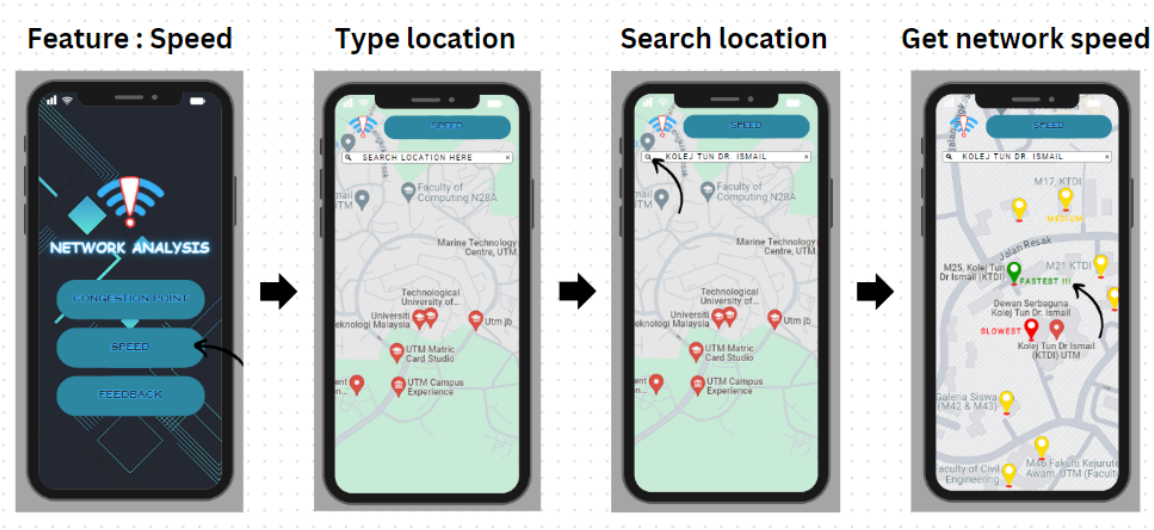
While thinking about solutions for inefficient data transfer in network and network congestion, many more ideas have been brought up by our team members. One approach involves implementing smart algorithms that analyze the data flow, and automatically avoiding congested paths in real-time. Besides, analytic applications can be used to predict the areas of peak network usage. Lastly, education campaigns can be held to promote efficient data transfer practices in public areas, contributing to a collective effort in maintaining network efficiency.

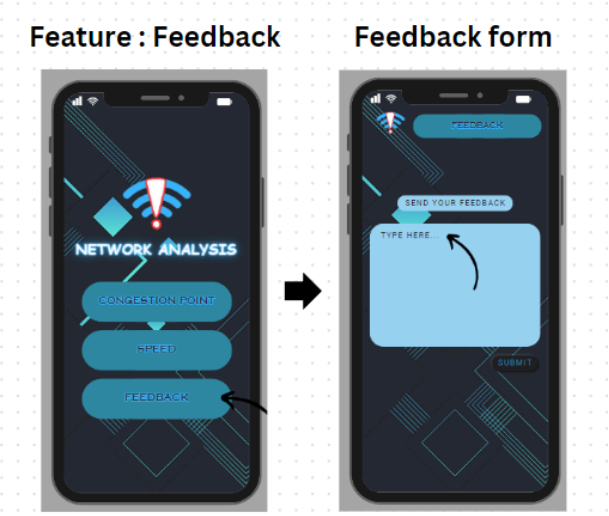
4.4 PROTOTYPE

After discussion with all group members, we decided to make a digital prototype using Canva. We build an interactive animation, like a mobile application, to show how our prototype works. This app is named Network Analysis : Find Your Network. This app has two main functions and one feedback form. The first main function is called Congestion Area, where users can find the area with the highest number of active users at their chosen location. Next, users can also analyze network speed within their chosen location, so they can choose an area with the highest speed. These two features are added to the app to successfully overcome the inefficient data transfer problem.









4.5 TEST

The prototype has also undergone the test phase to see its operation and how it will help users overcome the inefficient data transfer problem. We tested our prototype with several users to test the functionality of the app. After the evaluation process, we received some positive feedback too, where users agreed that our app's navigation is clear to demonstrate how the app will work and get the network analysis instantly.

5.0 REFLECTION

5.1 NUR AMIERA ZULAIKHA BINTI HARDI

As a student aspiring to excel in the realm of graphic and multimedia software, my dream is to master a variety of design tools while developing a distinctive style that sets me apart in the dynamic field of software design and multimedia applications.

Design thinking serves as a guiding principle that profoundly influences the achievement of my aspirations. One fundamental aspect is understanding the needs of end-users. By identifying and analyzing the target audience for my designs, I aim to create solutions that are not only visually appealing but also cater to the specific requirements of users. This user-centric approach ensures that my designs are not just aesthetically pleasing but also functionally effective.

In conclusion, my dream of excelling in graphic and multimedia design is anchored in the principles of design thinking. By understanding user needs, embracing an iterative design process, I am laying the groundwork for a distinctive and impactful presence in the industry. Through collaboration, feedback, and networking, I seek to contribute meaningfully to the ever-evolving world of graphic and multimedia design. With each step, I am confident in my ability to not only master design tools but also to shape the future of software design and multimedia applications.

5.2 PUTERI NURUL SYAHIRAH BINTI MOHD NAZRI

My goals with regard to my course are to develop as much knowledge as possible about tools and technologies regarding graphics and multimedia software. My aim is to equip myself with all required skills and use them to solve real-time problems. By gaining experience through programmes, I could improve my critical thinking skills to solve problems effectively.

This design thinking is undoubtedly impactful on my goal with regard to my course because it requires me to go through five important processes to come up with a powerful solution for the problem. For instance, we started with the empathy phase to understand user's problems so we could brainstorm ideas to find the best functional approach for them. These processes help improve my problem-solving skills as well as my communication skills, as I have to engage with users and discuss with my team throughout the process.

Some of my plans for improving my potential in the industry are to keep engaging with the newest technologies. This is significant to ensure that I can employ the best approach and make use of the newest tools to deal with problems. Besides, I will also keep upgrading my skills to boost my marketability upon graduating.

5.3 TAN SZE QING

Firstly, my goal with regard to my course is striving for excellence when exploring and learning the course. For my short-term goal, I would like to develop as many new skills related to the course as possible since IT is a dynamic and evolving skill. I have to keep up with the latest technology and opportunities in order to stay competitive in the field. For my long-term goal, I hope to get a satisfying job related to my course in the future. A good position in the workplace is crucial because it enables me to enjoy my career. In addition, having a satisfied job allows higher quality of outcomes, efficiency and productivity.

This design thinking is absolutely impactful on my goals with regard to my program. I am able to strengthen my critical thinking to come out with suitable solutions to certain problems. This allows me to ponder from different aspects and figure out the most efficient solution to solve the problems in my program. Additionally, I have an opportunity to strengthen my soft skills, for instance teamwork, problem solving and creativity. This is beneficial for me to overcome all kinds of obstacles when further studying the course.

It is important to have necessary improvements or actions for me to improve my potential in the industry. First of all, it is necessary for me to strengthen my interpersonal skills. In daily life, I would like to observe others' interpersonal interactions or work with a mentor on this skill. Thus, I am able to become a better team member and improve customer service in the industry. Furthermore, I would take action on enhancing my organization skills. In order to achieve this target, I have to manage my time wisely and create my own daily schedule.

5.4 CHENG KANG HUEY

My goal in regard to my course is to gain enough experience through comprehensive learning and hands-on practice. I aim to equip myself with required skills in the graphics and multimedia software field such as programming and designing skills.

By participating in this design thinking process, I have learnt that there is a systematic approach to take when finding solutions for a specific problem. This has improved my problem-solving and communications skills as we all suggested and discussed our own ideas. I have gained a lot of insight through design thinking on how to contribute ideas and turn them into a tangible product, which is a skill that would help me to reach my goal of preparing myself for my future career.

To improve my potential in the industry, it is important for me to actively stay updated on emerging technologies and industry trends. This proactive approach will ensure that my knowledge remains relevant, allowing me to adapt to the evolving landscape of the graphics and multimedia software field. Continuous learning about advancements will not only enhance my skill set but also position me as a valuable asset in the competitive industry I aim to thrive in.

5.5 ALICE LEE HUI MEE

My goal for my graphic and multimedia software course is to become an innovative professional. I aim to master all necessary skills to create awesome and impactful designs, understanding everything from basics to the latest trends. I'm excited to explore how to use technology to make my designs look really cool.

Design thinking plays a crucial role in achieving this goal. It helps me solve problems better and enhances my problem-solving abilities. By using design thinking, I can be creative when facing challenges, ensuring that the solutions I come up with not only work well but also look great. This aligns perfectly with my goal of becoming highly skilled in graphic and multimedia software.

To improve in the industry, I plan to continue learning and applying design thinking in practical ways. This involves staying updated on what's new, trying new design ideas, and seeking feedback to enhance my skills. Additionally, I'll connect with professionals, work on real projects to grow and succeed in graphic and multimedia software. Embracing a mindset of continuous improvement, I believe that staying curious and adaptable will be key to achieving success in this dynamic field.

6.0 LIST OF TASK

MEMBER	TASK
NUR AMIERA ZULAIKHA BINTI HARDI	● Report : Cover, Table of Content & Report Framework ● Prototype (Process of Making & User Testing)
PUTERI NURUL SYAHIRAH BINTI MOHD NAZRI	● Prototype (Process of Making, Finalize & Demo) ● Report : Design Thinking Evidence (Prototype & Test)
TAN SZE QING	● Report : Introduction ● Report : Design Thinking Evidence (Define)
CHENG KANG HUEY	● Interview Session - Cameraman ● Report : Detail Description (Problem & Team Working) & Design Thinking Evidence (Empathy & Ideate)
ALICE LEE HUI MEE	● Interview Session - Interviewer ● Report : Design Thinking & Detail Description (Solution) ● Video Editing

7.0 VIDEO

https://youtu.be/_uqjlxZwFM0?si=TDODFlfBBVYyrsC0