FACULTY OF COMPUTING
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TECHNOLOGY AND INFORMATION SYSTEM

REPORT on DESIGN THINKING

VIDEO LINK: https://youtu.be/BC_KghbSVH8

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1.0 Introduction

Design thinking is a problem-solving approach that prioritizes empathizing, defining, ideating, making prototypes, and testing. It involves understanding and empathizing with end-users, defining the problem at hand, generating potential solutions through ideation, creating prototypes, testing those solutions, and ultimately implementing the most effective one. This user-centred methodology encourages a collaborative and open-minded mindset, fostering innovative solutions that address users' needs and preferences. Design thinking is not confined to specific industries or fields, as it is a versatile framework applicable to various challenges, promoting user-centric solutions through a dynamic and iterative process.

Our team has come up with a smart way to deal with the common worries that all cloud users face, especially when it comes to keeping things secure. People often get concerned about the safety of their important data in the cloud. To tackle this, our solution suggests using clever automation tools, name POWER_RANGERS. These tools work like a guard, making sure strict security rules are followed, keeping an eye on how things are set up, and quickly responding to any security issues. By doing this, our solution not only deals with the worries but also makes cloud computing safer for everyone, adding an extra layer of protection to their important information.

2.0 Detail steps and descriptions

Our team has designed a smart solution to address the typical worries of cloud users, notably students at University Technology Malaysia (UTM), about the security of their essential data. Recognizing the widespread concerns about data security in the cloud, our proposal introduces a set of sophisticated automation tools dubbed POWER_RANGERS. These tools serve as vigilant guardians, ensuring strict adherence to security regulations, monitoring the setup, and responding quickly to any security issues that develop. This approach not only addresses existing concerns about cloud computing, but it also improves overall safety by providing an extra layer of protection for users' vital information. By integrating POWER_RANGERS, our technology helps to make cloud computing a safer environment for everyone.

Empathize

- Understanding the worries and concerns: Through significant study and engagement with UTM students who use cloud services, our team has taken the time to truly understand individuals' concerns about the security of their data in the cloud. This sympathetic method entails carefully listening to student experiences, concerns, and criticism to develop a real knowledge of their needs.

- Recognizing the need for a solution: By realizing that UTM students need both security and peace of mind, our team exhibits a deep empathy for the emotional components of the user experience. This is more than just solving a technical issue; it is about giving a full solution that connects with pupils on a personal and emotional level.

photo of interview section

Define

- Clearly defining the problem: Our team has identified and articulated the crux of the issue – the security concerns associated with storing crucial data in the cloud for UTM students. This step is crucial as it ensures that the subsequent solution directly addresses the core challenges faced by UTM students, providing a clear direction for the design process.

- Naming the solution - POWER_RANGERS: The term POWER_RANGERS adds a distinctive and memorable element to the solution while also conveying a sense of empowerment and protection. This naming method not only addresses the identified problem, but it also helps to create a good and empowered user experience.

photo of group discussion

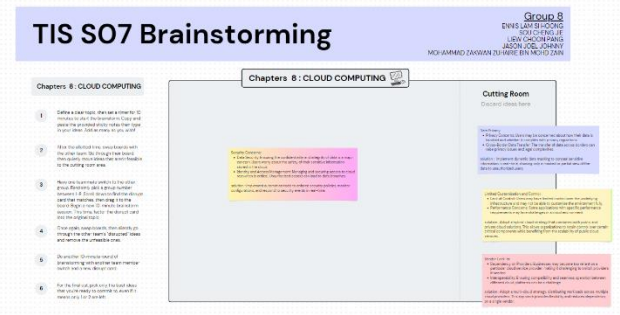

photo of brainstorming section

Ideate

- Developing intelligent automation tools: The ideation step entails thinking imaginatively about possible solutions. Our team has gone above and beyond standard ways, proposing the creation of innovative automation technologies. This demonstrates a dedication to creativity and a readiness to investigate innovative, effective approaches to solve UTM students' security concerns about cloud computing.

- The concept of POWER_RANGERS suggests a proactive approach: The use of the moniker POWER_RANGERS goes beyond simple branding. It emphasizes taking a proactive and alert approach to security challenges. This not only coincides with the concept of establishing automated tools, but it also communicates a sense of constant monitoring and quick response, which are critical components in improving the security of cloud computing for UTM students.

Prototype

- Prototyping is an important phase in the design thinking process because it allows us to bring our suggested solution, POWER_RANGERS, to life in a tangible and tested way for UTM students. In this step, we hope to construct a prototype that simulates the functionality and capabilities of the automation tools, ensuring that they properly handle the identified security problems in cloud computing for UTM students.

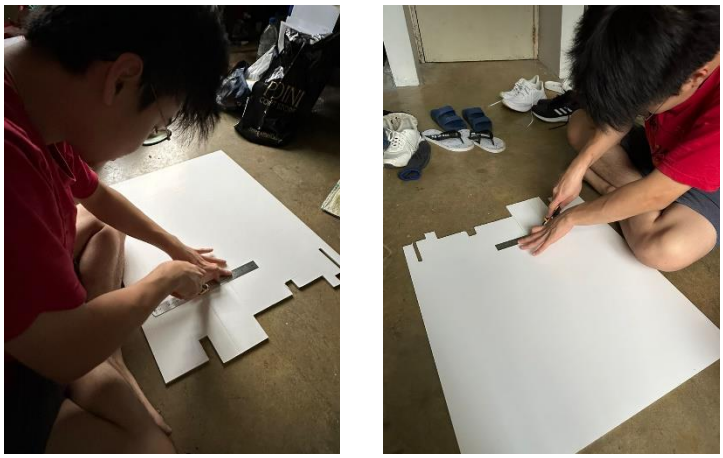

photo when making prototype

3.0 Detailed descriptions (problem, solution and team working)

Problem description

In 2024, adoption of cloud computing is widespread and has significantly streamlined various aspects of our lives, giving us convenience and increasing our working or studying efficiency.

However, as technology keeps on improving it has brought us to some critical concerns which are data security and identity/access management.

Ensuring the confidentiality and integrity of data stored in the cloud has become one of the biggest challenges for cloud computing developers. Users want their data to be secured and protected. But unluckily as the technology keeps on improving and evolving hackers have slowly gained the ways to attack and steal data from the cloud services, making security of cloud computing to be doubted.

Besides that, users also want their cloud computing storage to be accessed by more than one owner. Making it another challenge for the cloud computing developers to manage with the identity and access management. They have to ensure there is no unauthorized access which would lead to severe data breaches. Thus, the security system between data protection and access control is closely related.

Solution for the problem stated

Due to all the problems and challenges stated above our group came to a conclusion to develop an application which is an automation tool to enforce security policies, monitor configurations, and respond to security events in real-time. The application implements the master-slave control system which gives access and power to the master to distribute the access qualification for other users but still remains the final decision power.

The primary objective of the application is to protect data security by monitoring the system and notifying the master about each slave's actions. By incorporating the master-slave control system, the application not only provides efficient access management but also ensures a centralized decision-making process. This approach adds an extra layer of accountability and control, reinforcing the overall security framework.

Teamworking

Our group discussed the problem and challenges faced by cloud computing users and developers by implementing a brainstorming process. We did a lot of online research to find out the most effective way to solve problems faced in cloud computing.

Although the time given for this project was limited, we managed to agree with this final solution which is to develop an application named POWER_RANGERS to solve some majors the problems and challenges faced.

POWER_RANGERS is envisioned not only as a practical response to the existing challenges but also as a proactive tool to enhance the overall experience for both users and developers in cloud computing. The application aims to streamline processes, optimize functionalities, and provide a user-friendly interface, contributing to a more robust and efficient cloud computing environment. It is not just an application but our proof of hard work.

4.0 Design thinking assessment points

An assessment point, in the context of design thinking or project evaluation, is a stage where the progress, effectiveness, or success of a project is reviewed and evaluated. It involves assessing the outcomes, processes, and deliverables against predetermined criteria or objectives. Assessment points are important for us to identify the problems, and try to give solutions. They provide a structured framework for evaluating and optimizing various aspects of a project, leading to better decision-making, improved quality, and increased chances of overall project success.

4.1 empathize

In the empathize phase, we had conducted interviews with students in UTM, asked them about their thoughts on cloud computing. The team showcased a deep understanding of University Technology Malaysia (UTM) students' concerns regarding cloud data security. Through extensive study and active engagement, the team empathetically listened to user experiences.

4.2 define

Moving to the define phase, the team adeptly articulated the problem – the worries of UTM students about the security of their essential data in the aligns cloud. This clear definition laid the groundwork for a solution that directly with the identified challenges, providing a focused direction for subsequent design efforts.

4.3 ideate

In the ideate phase, creativity took center stage as the team proposed POWER_RANGERS, a set of innovative automation tools. This solution not only addressed the security concerns but also emphasized a proactive approach, showcasing a commitment to exploring novel and effective methods for resolving UTM students' cloud computing anxieties.

4.4 prototype

Transitioning to the prototype phase, the team acknowledged the importance of tangible development. By constructing a prototype simulating POWER_RANGERS' functionality, the team aims to ensure the effectiveness of the automation tools in handling identified security issues, providing a hands-on experience for testing and refinement. We also found out that there are some functions and difficulties of our apps that can be improved and modified for a better user experience after doing the evaluation process.

In conclusion, the team's design thinking journey reflects a thoughtful progression through the empathize, define, ideate, and prototype phases. Their empathetic understanding of user concerns, clear articulation of the problem, creative solution ideation, and commitment to tangible prototyping demonstrate a comprehensive and user-centric approach to addressing cloud data security for UTM students.

5.0 Design thinking evidence

a) The sample work by students working to solve the design challenge

After conducting the inquiry, we found that some students are worried about the security of their data when using cloud storage. Due to this problem, our team has designed a smart solution to address these concerns. Our proposal presents a suite of advanced automation tools known as POWER_RANGERS.

b) Record of each phase:

I. Empathize

We did interviews to learn more about cloud user experience among UTM students. These interviews have helped us to understand different perspectives and experiences of cloud users, which is important for improving our ideas. The information we got from these interviews is helpful in developing and making our solutions better.

Interview question

1. Do you know what is cloud services? Are you using it?

Yes, cloud services are some applications that allows me to store data in the Internet or network. And I’m using it such as Google Docs and others.

2. Does it brings you any advantages or benefits?

Yes, it does. I can store any data I want, carrying just my phone without others storing devices such as pendrive or hard disk. So, it is easier to walk round with my data.

3. Have you ever doubted the security system of the cloud service?

To be honest, yes because it is accessable by others if it is not carefully secure. So, others can access to my data and read my data.

4. Have you faced any challenges when using cloud service?

Yes, one of the main challenges is that I cannot monitor my file and my data in real time. For example, if my teammate or assignment groupmate acidentally make changes or deleted important files and data, I cannot immediately restore my data and it will cause the data to loss in the Internet.

II. Define

In this phase, we listed out all possible problems that users may face to ensure the safety of all their data and information.

1. Users don't know how to keep their data safe while using cloud storage.

2. Users don’t know how to manage access to their file in cloud storage.

3. Existing ways to secure our files access are quite complicated and may cause confusion to users.

4. It's hard to see what changes are made in shared files, and important data needs more protection to make sure only the right people can access it.

III. Ideate

During the ideate phase, we prioritized creativity, presenting POWER_RANGERS as a set of inventive automation tools. This not only tackled security concerns but also highlighted our proactive approach, demonstrating our dedication to discovering innovative and effective solutions for addressing UTM students' cloud computing anxieties.

IV. Prototype

In this phase we have created low-fidelity prototype to present our idea. We have created a prototype using cupboard and paper to represent an application that works like a security tool, enforcing rules, checking settings, and reacting to security issues in real-time. We used a master-slave control system, letting the master control who gets access while keeping the final say. The main goal is to make data safer by keeping an eye on the system and telling the master about what others are doing in real-time. With the master-slave system, our model makes access control smoother and sets up a central way to make decisions. This smart approach adds an extra layer of control, making the security system stronger. Right now, we're busy creating and testing the model, making sure it has all the features needed for a great solution to the problems we found.

6.0 Reflections

ENNIS LAM SI HOONG

Usage of cloud computing not just makes our life convenient but also increases our productivity. Personally, I like to use cloud storage as it can sync my data by logging in into the same account which makes my work more efficient and easier. But we cannot argue that there are risks and threats to locate our important data online, so enhancing the security protection of our cloud computing service is a must for all cloud computing companies.

As a graphic and multimedia software's student, my goal is to develop a game or a system which can be used worldwide. Thus, the security and privacy of cloud computing is important for me as the trend is moving forward to cloud computing service. Maybe in the future, games are all cloud based and no need for hardware. The importance of prioritizing security and privacy cannot be overstated.

In terms of improvement, I think I can improve my time management and self-study skills as both are extremely important in order to be successful in the competitive future. There is no end in learning, learning process should be ongoing at any time.

JASON JOEL JOHNNY

As a student partaking in the Graphics and Multimedia Software course, my overarching goal is to cultivate a profound understanding of cutting-edge technologies and innovative design principles within the realm of graphics and multimedia. I aspire to not only excel academically but also to translate theoretical knowledge into practical skills that can contribute meaningfully to the industry.

The application of design thinking in my coursework has been instrumental in shaping and refining this goal. By immersing myself in empathetic problem-solving, defining user-centric challenges, ideating creative solutions, and prototyping designs, I've learned to approach complex problems with a holistic and innovative mindset. This design thinking process has not only enhanced my technical proficiency but also fostered a deep appreciation for user needs and preferences, aligning my aspirations with the demands of the industry.

To further improve my potential in the industry, I recognize the importance of staying updated on emerging technologies, engaging in practical projects, and seeking opportunities for real-world application of design thinking principles. This proactive approach ensures that I am well-prepared to contribute meaningfully to the ever-evolving landscape of graphics and multimedia software.

SOU CHENG JIE

As a student in graphic and multimedia, this program has truly highlighted the vital need to keep user data secure. Understanding how crucial it is to deal with issues like data security and access management in the cloud has becomes a tip for me to face the upcoming challenges. Learning how to make the internet safer has been really interesting for me. Figuring out how to keep data safe in the cloud and control who can access it is like solving a puzzle, but finding solutions makes me feel proud. Knowing that our work could make the internet a safer place is super motivating. I can imagine people everywhere using the internet and feeling sure their information is safe because of what we're doing in graphic and multimedia projects. It makes our work in this field feel important.

LIEW CHOON PANG

Exploring cloud computing as a computer science student has been an eye-opening experience. The convenience it offers is clear, but so are the growing concerns about data security and access

management. The outlined problem of hackers targeting cloud services and the delicate balance between data protection and access control resonates with the evolving nature of technology. The proposed solution, POWER_RANGERS, showcases a thoughtful design thinking approach. Understanding user worries, defining the problem, and ideating creative solutions align well with user-centered design principles. I am very optimistic about the future technology development of cloud computing and cloud storage. This will change the current storage method in the technology industry. For example, when playing games in the cloud, users can play them without downloading them, which greatly reduces the hardware requirements of the client

MOHAMMAD ZAKWAN ZUHAIRIE BIN MOHD ZAIN

As a computer graphic and multimedia's student my goal is to create modern and user-friendly digital experiences that blend style with practicality. I want to contribute to the success of digital products by designing interfaces that not only look good but also guide users smoothly and make their journey enjoyable and efficient. To achieve this, we need to ensure the safety of user data and information. Design thinking will guide me to meet my goal by help me to solve problem efficiently and practical way during all phases involved. To improve my potential, I plan to associate with people who are more knowledgeable in a particular field so that I can learn more from them in terms of knowledge and skills.

7.0 Group Tasks

ENNIS LAM SI HOONG – Build prototype
JASON JOEL JOHNNY - Interview
LIEW CHOON PANG – Report writing
SOU CHENG JIE – Video editing
MOHAMMAD ZAKWAN ZUHAIRIE BIN MOHD ZAIN – Report writing