UTM

UNIVERSITI TEKNOLOGI MALAYSIA

Faculty of Computing

SECP 1513 Technology and Information System

Section 06

Design Thinking Report

Lecturer Name: Dr. Sarina binti Sulaiman

Group Name: Hello, World!

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Introduction

Design thinking is an innovation methodology that emphasizes a human-centered approach to finding solutions. The goal of design thinking is to develop solutions that are not just functional but also meet the actual needs and desires of the end-users. Design thinking typically involves the following stages:

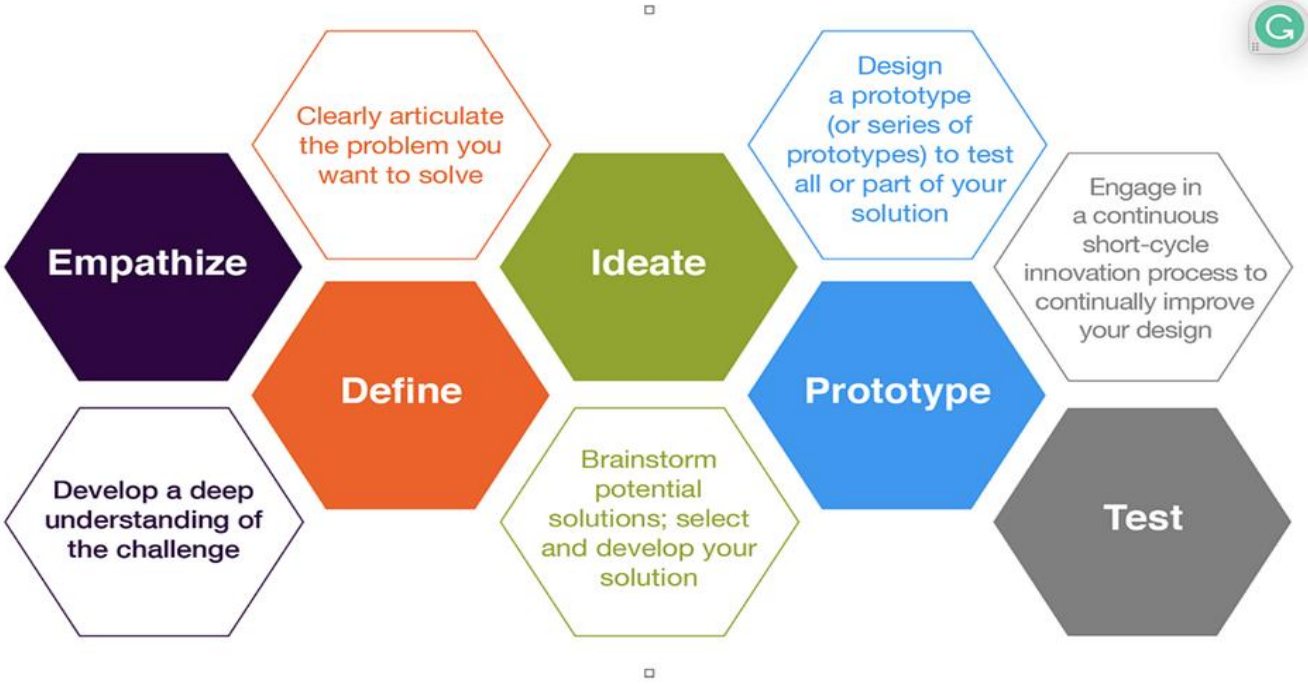

Image 1
Design thinking overview (*Design Thinking*, n.d.)

(46 words)

Ideate

In the brainstorming session, we had a discussion and found out the problems and solutions that relate to our topic 1. Finally, we chose the sticky note that was written by our group leader, Reza, after receiving the feedback and improvements given by the teacher and group 8.

The Idea

Problem: Some users of the world wide web have disabilities. Unfortunately, some websites do not have features that can assist disabled people, making it tougher for them to use such websites.

Solution: Introduce features that can assist disabled people, such as dyslexia font, text-to-speech, speech recognition, reduced motion, and more.

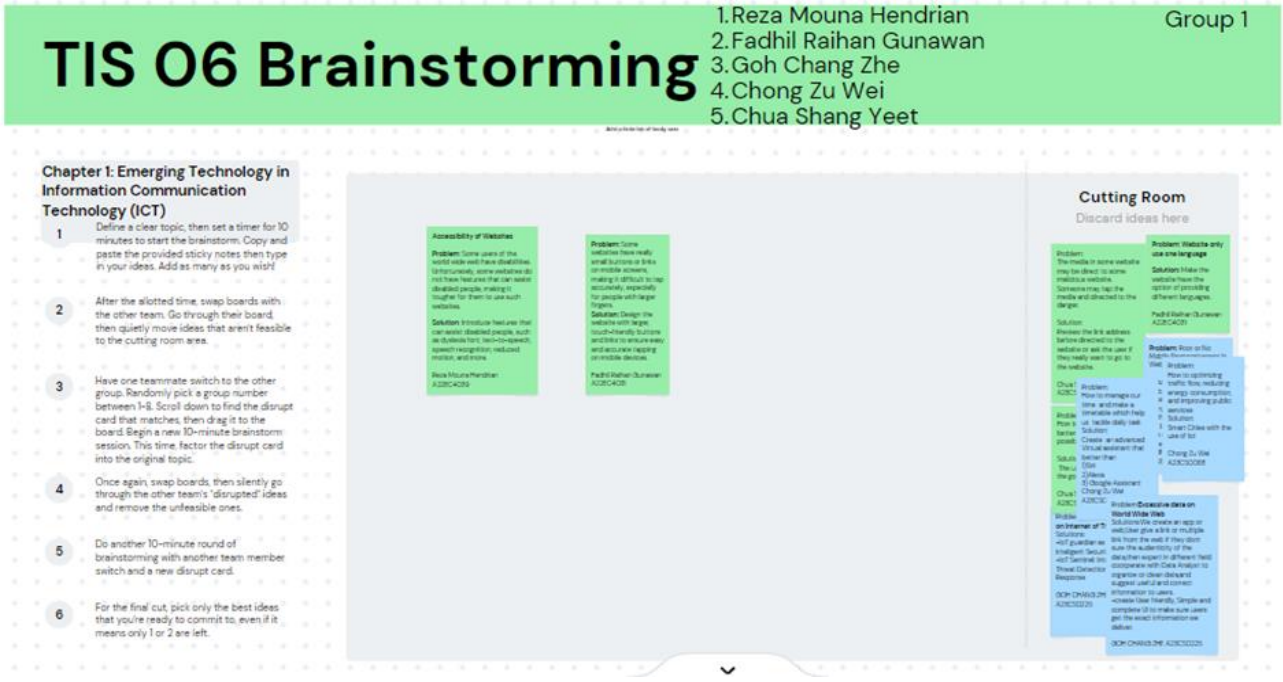

Image 2
Brainstorming Session

(98 words)

Problems and Solutions

Nowadays, there are some websites that are fully written in small font, low contrast UI, or inaccessible forms and buttons. Conversely, there are people with eye problems such as short-sightedness, long-sightedness, blurry eyes, and blindness. These people may face difficulties when browsing websites without the features stated above. For example, golden-agers with long-sightedness have some difficulties looking clearly at the interface of websites that are too dark or have small-sized words. They may feel discomfort when using those websites.

No.	Problem	Solution
1.	Individuals with dyslexia have a learning disorder that involves difficulty reading due to problems identifying speech sounds and learning how to relate letters and words (decoding).	Introduce features which can change the websites' words font to a dyslexia font. It is a unique typeface that makes reading easier and improves the readability for the individual with dyslexia.
2.	Individuals may have an eyesore when looking at the screen of electronic devices for a certain period.	Introduce the text-to-speech feature for webpage content. The content will be read out loud for the individuals, so they do not need to look at the screen for a long time or have a break after looking at the screen for a period, so their eyes do not hurt badly.
3.	Most golden agers have long-sightedness problem especially the content of the website with small font and the alphabet on the keyboard.	Provide customizable font sizes, so the user can increase the size of the content and read the content clearly. Some websites do not have a voice recognition feature, so we can introduce voice recognition for text input. Therefore, golden agers can use voice recognition for input and do not need to type the words or sentences out.
4.	There are some websites that display their contents in an animated fashion. These animations may bring discomfort to users.	Introduce the reduce motion feature to allow users to turn off animations. This will help them read the content of websites.

Table 1
Problems and Solutions

(332 words)

Team Working

The Hello, World! group's members are very cooperative on our design thinking project. Every member presented their own problem and solution during the brainstorming session. Reza Mouna Hendrian contributed a very interesting problem and the solutions during the brainstorming session. Goh Chang Zhe led the public survey by Google Form and contributed a brilliant observation to the overall report. Chua Shang Yeet and Chong Zu Wei cooperated to record the evidence of our team's work and compile the project report. Reza Mouna Hendrian and Fadhil Raihan worked together and actively participated in prototype development. As a result, every group member tries hard to identify issues, suggest answers, emphasize the significance of our invention, and highlight the characteristics of website extension, resulting in an accurate and all-encompassing project completion.

(130 words)

Detail Step and Description in Design Thinking

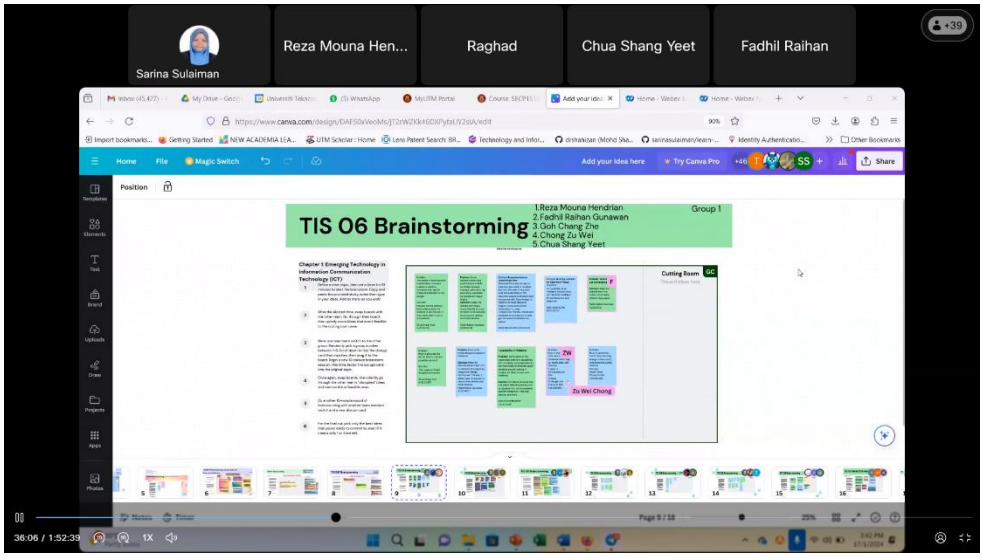

Image 3
Live brainstorming session in Webex

(17 January 2024 14:00-17:00)
During the brainstorming session, all group members contributed at least one idea regarding the chapter we have learned in the Technology and Information System course.

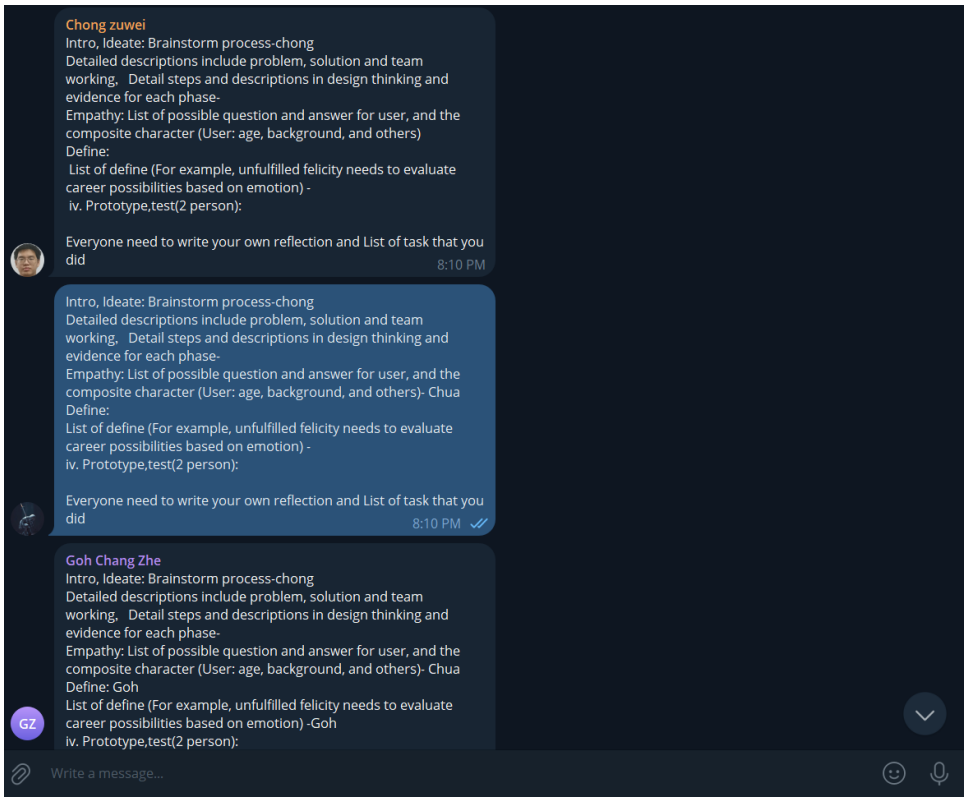

Image 4
Task distribution in Telegram group

(18 January 2024)
Within the Telegram group, we distributed our tasks equally and clearly.

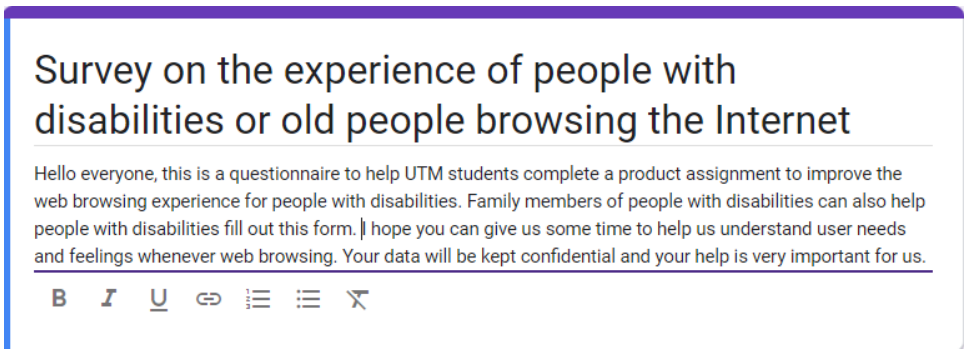

Image 5
Survey Title

(19 January 2024)
Goh Chang Zhe prepared a survey using Google Form and distributed it to the public.

48 responses

Link to Sheets

Accepting responses

Summary | Question | Individual

Your age

48 responses

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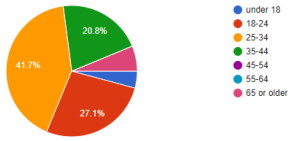

Gender

48 responses

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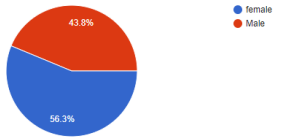

Do you have disabilities?

48 responses

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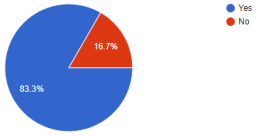


If you have a disability and don't mind, please tell us about your disability.

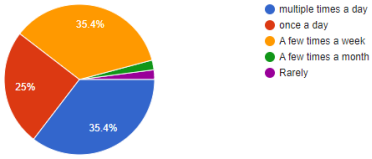
11 responses

Blurry eyes
physical
Eye-sight problem
Deaf
eye-sight problem
Physical

How frequently you use the internet?

48 responses

Copy



What are the main challenges you face while browsing the Internet due to your disability?

46 responses

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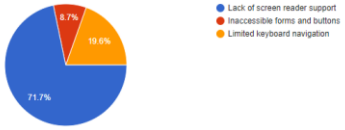
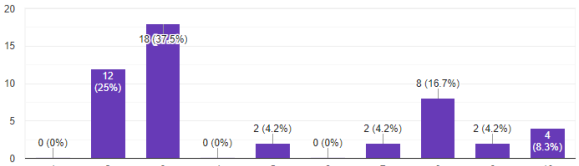


On a scale of 1 to 10, how would you rate your overall satisfaction with the current accessibility of the websites you visit?

48 responses

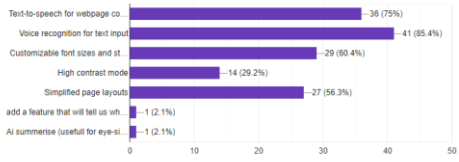
Copy



Which of the following features would you find most beneficial in a web extension aimed at improving web accessibility for people with disabilities? (Select all that apply)

48 responses

Copy



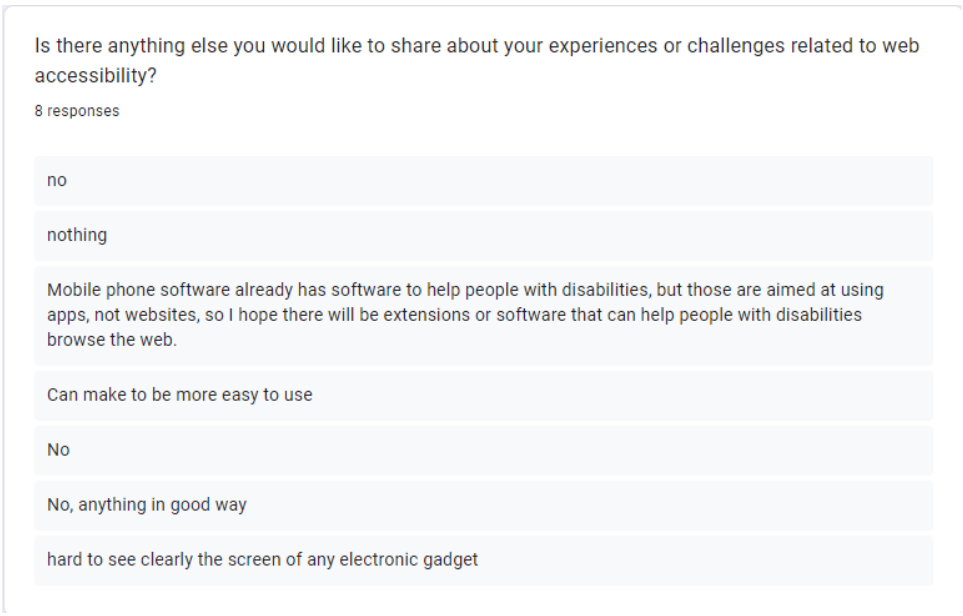


Image 6-10
Survey Results

(23 January 2024)
The survey ended, and the answers were collected.

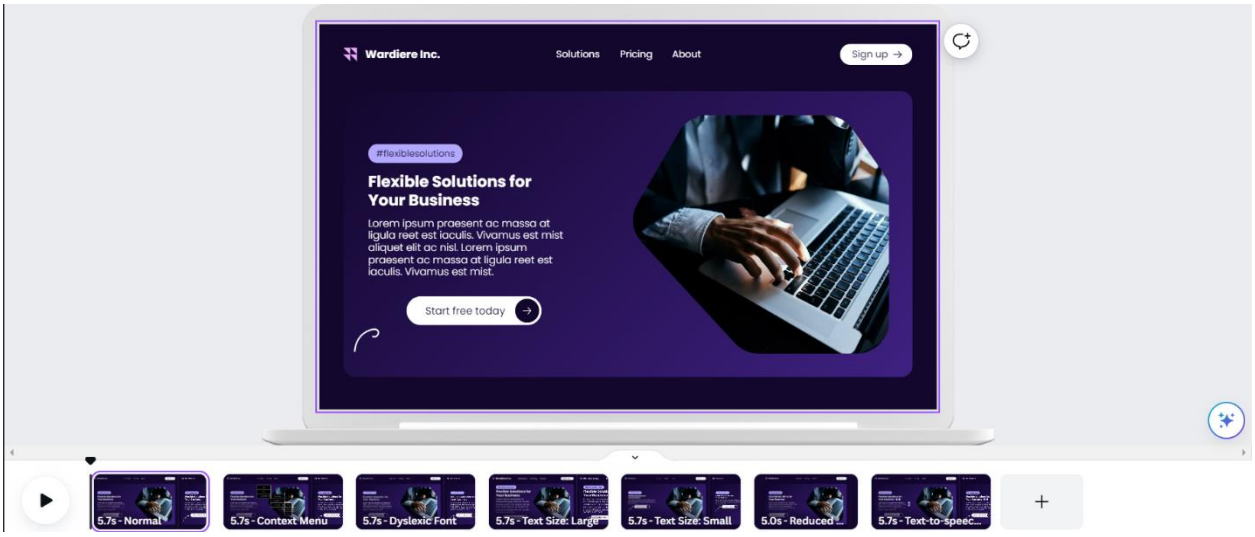


Image 11
Prototype Successfully Built

(25 January 2024)
The low fidelity prototype has successfully built credited to Reza Mouna Hendrian and Fadhil Raihan Gunawan. The prototype is ready to be tested by the user.

Step / Date(2024)	16-Jan	17-Jan	18-Jan	19-Jan	20-Jan	21-Jan	22-Jan	23-Jan	24-Jan	25-Jan	26-Jan	27-Jan
Introduction												
The Idea												
Brain Storming												
Problem and Solution												
Emphaty (survey)												
Prototype												
Test												
User feedback												
Conclusion/reflection												

Table 2
Project Timeline

(101 words)

Low-fidelity Prototype

Our low-fidelity prototype was designed with the outlined problems and solutions in mind. In the prototype, we chose to make the headline of a random web page to showcase how we implement our solutions. This minimized the work that we needed to do while still achieving the solutions we desire.

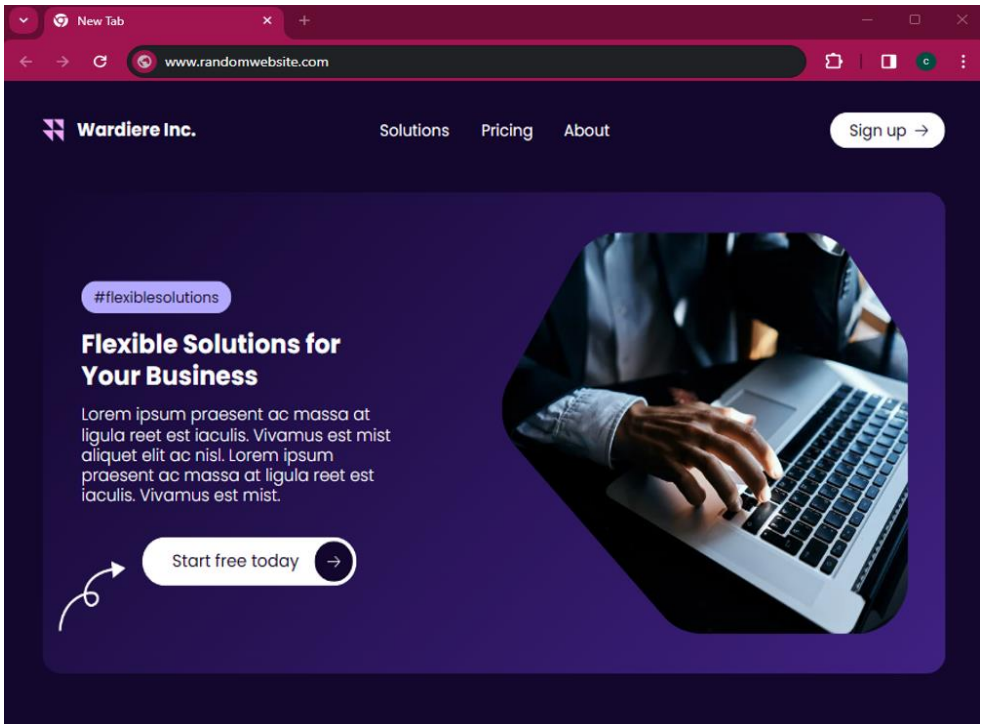


Image 12
A Random Website Homepage

The image above shows the normal view of the homepage of a random website. To access the accessibility menu, the website implements a context menu that is accessible via right-click on desktop or hold on mobile devices. By default, the size of the text that is displayed on the website is medium. Toggling an accessibility feature is as simple as going back to the menu and selecting the feature again.

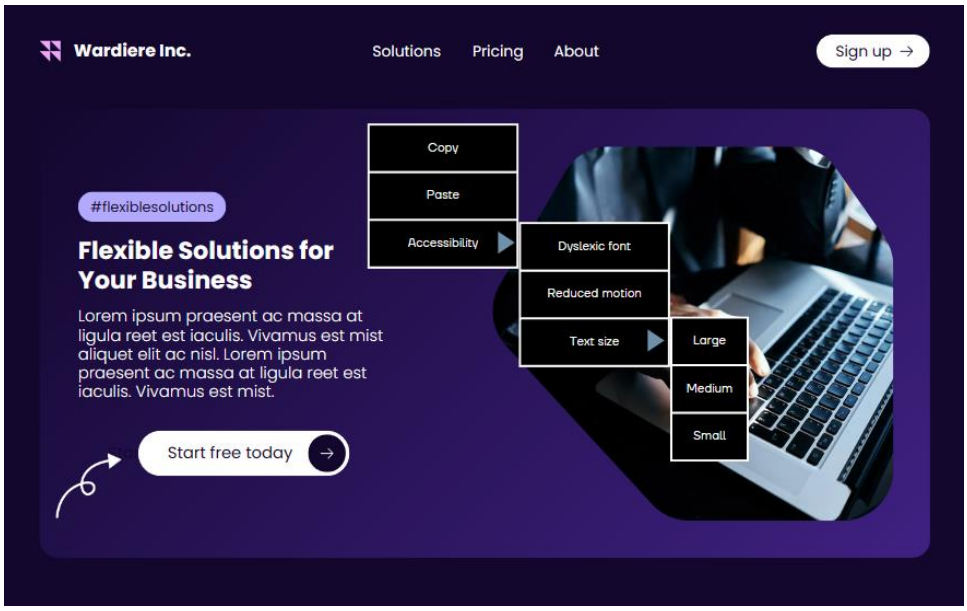


Image 13
Context Menu in Website

When enabling dyslexic font, all fonts of the website are replaced with the Open Dyslexic font, which is a font family that is intended for dyslexic users.

Image 14
Website with Dyslexic Font

The text size accessibility feature is as simple as it gets. It allows the user to customize the font based on their needs.

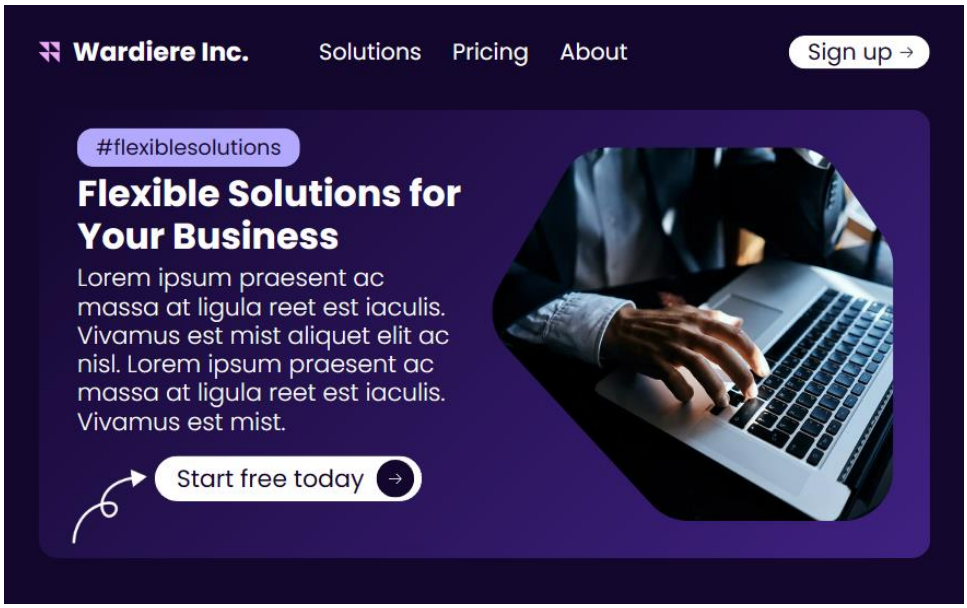


Image 15
Website Homepage with Large Text Size

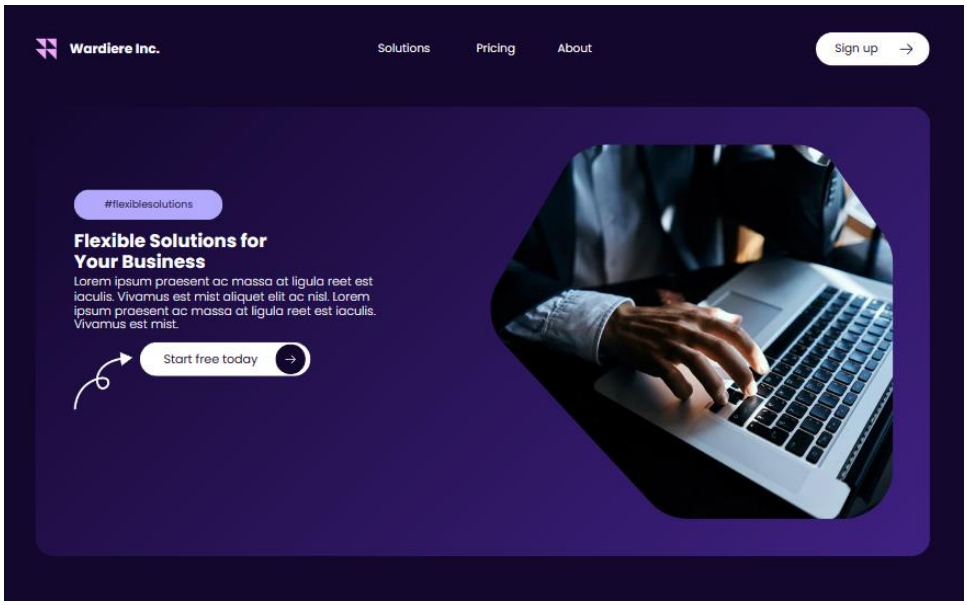


Image 16
Website Homepage with Small Text Size

Reduced motion is another key accessibility feature that helps users with motion sickness. By enabling it, all animations on the website are removed. In our prototype, the arrow that points to the button has an animation. When reduced motion is enabled, the arrow is removed.

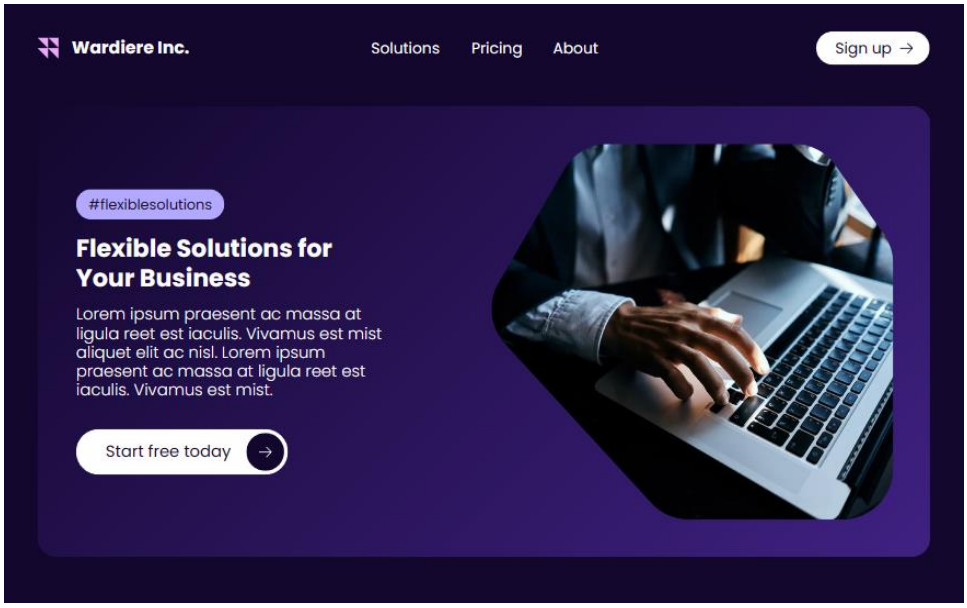


Image 17
Website Homepage with Reduced Motion

Lastly, we added text-to-speech and speech recognition. Text-to-speech allows the device to read the text loud out for the user, while speech recognition allows the device to convert the user's voice into text. In our prototype, two bubbles will appear when the user hovers over a text. Text-

to-speech is denoted with the mic button, while speech recognition is denoted with the chat bubble button.

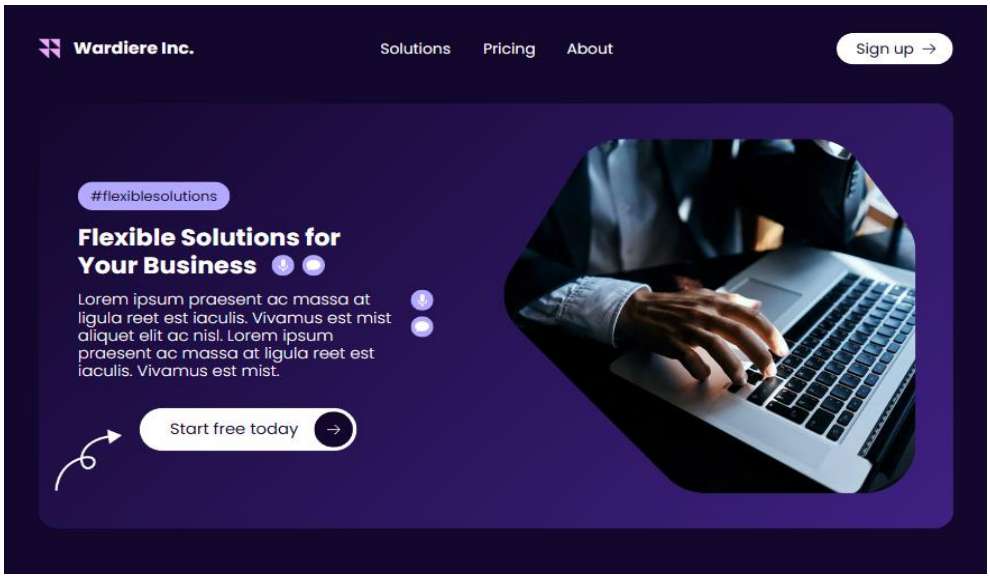


Image 18
Website Homepage with Text-to-Speech and Speech Recognition Buttons

(279 words)

Testing

The testing of our prototype was done by a sample of people with various disabilities. As the prototype was a low-fidelity prototype, there was not much to be tested other than discussions as to whether the features we offered would meet the users' requirements.

Empathy

It is worth noting that the internet is now essential in people's lives, but there are still a few groups who cannot enjoy this facility due to its compatibility, such as elderlies and the disabled. Today's mobile phones have accessibility features, but these features are limited to apps rather than internet web pages. Therefore, these groups will encounter various difficulties in browsing the web, such as visual impairments, hearing impairments, and motor impairments (inability to use a mouse or keyboard normally), cognitive impairment (inability to understand complex content), photosensitive epilepsy (some irritating elements such as strong color contrast, rapid flashing), and other neurological disorders.

Engagement

We conducted a survey via Google Form and spread it in OKU community in various social media platforms to understand the experience of people with disabilities or old people browsing the internet. Respondents have expressed their dissatisfaction and suggested features and approaches to improve their experience.

(150 words)

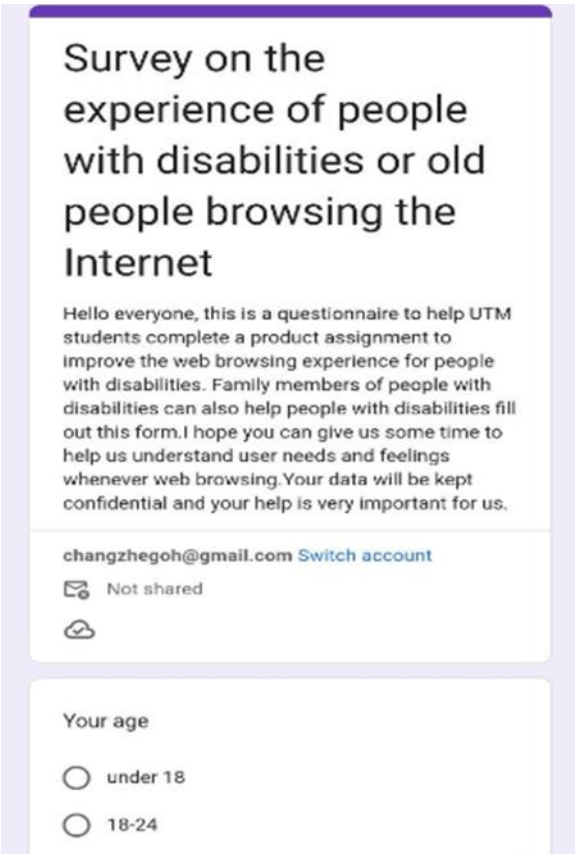


Image 11
Survey Homepage

Define

The unsatisfying experience from disabled people is due to designs not considering the needs of disabled individuals, making it difficult or impossible for them to access and navigate the content.

Second is a screen reader barrier. It occurs when a website only provides text content, but users have visual impairment and devices do not have a screen reader or the website is not compatible with screen readers.

Individuals who are deaf or hard of hearing present an imperative aspect of web accessibility. One noteworthy challenge lies in the reliance on auditory cues, such as audio-only content or messages, which can be inaccessible to this demographic.

Moreover, keyboard navigation challenges represent another facet of accessibility issues, particularly for those with mobility impairments. When websites lack proper support for keyboard navigation, users encounter difficulties interacting with and moving through the site.

Poor contrast and color selection can make a website difficult to access and read, creating challenges for visually impaired users by making it difficult to distinguish and read content.

(168 words)

Reflections

My goal from learning this course is to try my best to learn about technology and information systems within this limited time, and then effectively use this knowledge to improve my level and career. Compared with other subjects, this subject focuses more on completing assignments and communicating with team members, and these abilities will be of great help to our careers in the future.

From this project, I learned how to use the internet to conduct surveys, understand user needs, and how to track progress and complete projects in a planned way. This knowledge will lay a solid foundation for my career and bring me closer to my goals.

To maximize my potential, I will be more active in learning various IT knowledge, participating in various projects, observing the needs of people around me, and creating the best product to solve people's needs.

(143 words)

Referring to my course, my goal is to become a successful software developer because a successful software developer's experience can help me create revolutionary applications that can make a positive impact on people's lives.

From this design thinking project, we realized that design thinking encourages creativity and thinking outside the box and this mindset can help us come up with innovative ideas and problems that we face in our daily routine. Besides that, we also know how to create an application that can solve their problem and what the step you needed to take to help others.

The action that I need to take is to build a strong foundation in computer science and focus on mastering programming languages commonly used in software development, such as Python, Java, JavaScript, or others. Besides that, stay informed about the latest trends and advancements by following tech blogs, attending conferences, and being part of online communities. This can help me stay updated with industry trends.
(162 words)

The goal regarding the technology and information system I want to know what I can be and what problems or challenges I will face in the future so I can be well-prepared to go into the industry.

From the design thinking project, I know that there are some problems that may still be undiscovered by the developer or programmer that will affect the satisfaction of the users while using the application and browsing the website. Therefore, I could discover the problem and design a plan to solve it with my fellow team members. The design thinking assignment taught me how to communicate with the team members and think critically to solve problems with ease. As a result, I learned to communicate with my future colleagues and solve problems as a team.

I need to study my course synchronously and asynchronously hard to sharpen my skill as a programmer or a developer of websites and applications, so I have the skill to face a variety of challenges in the industry.

(169 words)

Referring to my course, my goal is to become a skilled and creative software engineer who knows how every computer component works; both internal and external. I desire to master problem solving in programming as well as being able to lead groups in establishing impactful plus moral modern technologies.

Design thinking highly affects my goal of becoming a competent as well as imaginative software program designer. It helps me advance my problem-solving abilities, leadership abilities as well as communication to develop impactful and ethical modern technologies. It improves my knowledge about the technological world.

To improve my potential, I'll participate in continuing education, use design thinking in real-world jobs, and concentrate on enhancing interaction abilities. I will additionally take notice of values in modern technology to match what the industry requires.

(131 words)

My goal is to become a competent software engineer who can create products in a professional and organized manner. A software engineer is not just someone who creates software, but also someone who delivers products to customers in the form of software. In doing so, they must analyze the requirements of customers. They must also know how to design products tailored to customers' requirements to an extent, as well as testing, deploying, and maintaining the products. That is the software engineer that I endeavor.

This design thinking activity helped in the first three phases of software development life cycle, that is preliminary investigation, requirement analysis, and design. A low-fidelity prototype is an early prototype to gain an initial grasp of the design desired by customers. It plays an important role in software development life cycle as it reduces the chance of wasted effort and time, due to the minimal requirements of low-fidelity prototypes compared to high-fidelity prototypes.

My plan to improve my potential in the industry is to keep learning. Technology is evolving at a very rapid speed, and if I do not keep up, I will be left behind. Apart from that, creating more projects allows me to apply my knowledge to build something, which I have done many times. However, many times is never enough. I need to continue doing so to improve and expand my knowledge in the huge world of software development.
(263 words)

Task Distribution

Tasks	Goh Chang Zhe	Reza Mouna Hendrian	Fadhil Raihan Gunawan	Chua Shang Yeet	Chong Zu Wei
Introduction					/
Ideate					/
Problem and solutions				/	
Detail step and Description in Design thinking& Team working				/	

Low-fidelity Prototype		/	/		
Testing		/	/		
Empathy& Engagement	/				
Define	/				
Reflections	/	/	/	/	/

References

- *Design thinking*. (n.d.). https://citl.illinois.edu/paradigms/design-thinking
- *Dyslexia - Symptoms and causes - Mayo Clinic*. (2022, August 6). Mayo Clinic. https://www.mayoclinic.org/diseases-conditions/dyslexia/symptoms-causes/syc-20353552