



**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!**

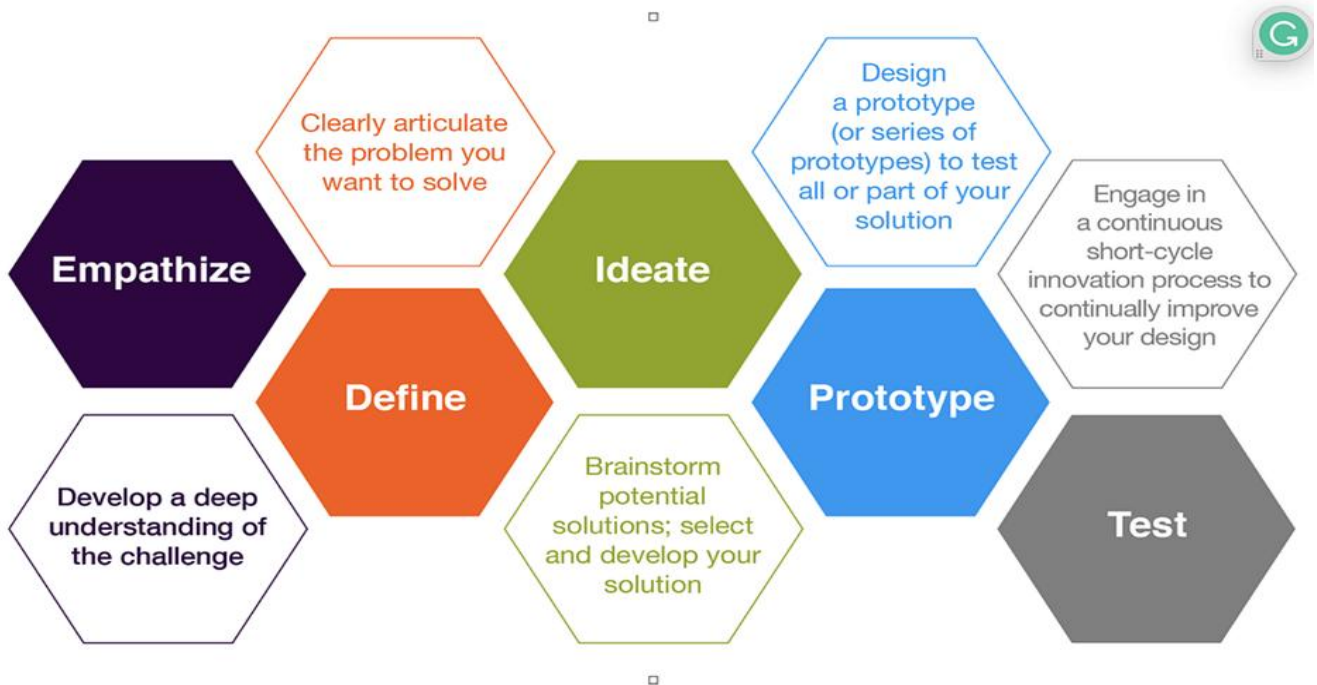
<b>No.</b>	<b>Group Member</b>	<b>Matric No.</b>
<b>1</b>	<b>REZA MOUNA HENDRIAN</b>	<b>A22EC4039</b>
<b>2</b>	<b>FADHIL RAIHAN GUNAWAN</b>	<b>A22EC4031</b>
<b>3</b>	<b>GOH CHANG ZHE</b>	<b>A23CS0225</b>
<b>4</b>	<b>CHONG ZU WEI</b>	<b>A23CS0068</b>
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## 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:



(47 words)

## Problems and Solutions

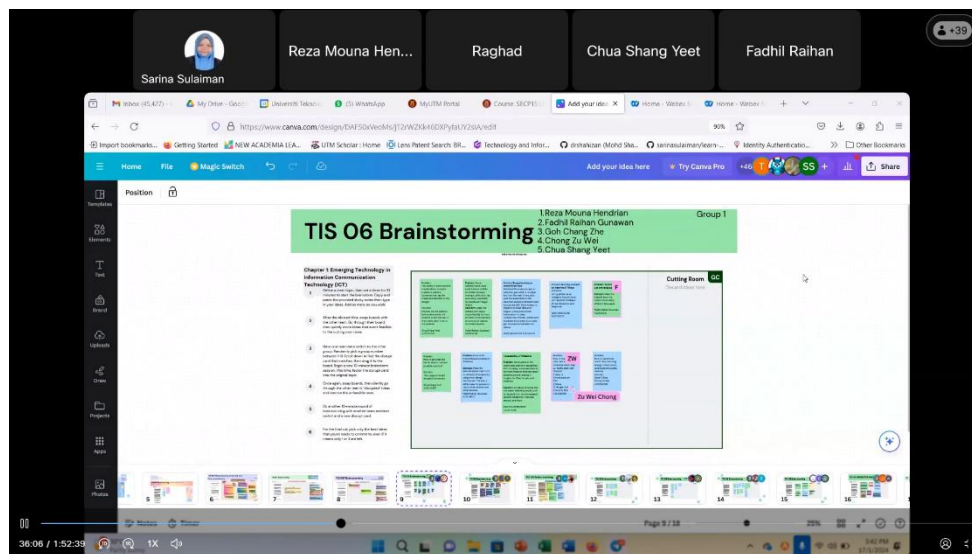
No.	Problem	Solution
1.	Individuals with dyslexia have a learning disorder that involves difficulty reading due to problems identifying speech sounds and learning how to relate letters and words (decoding).	Introduce features which can change the websites' words font to a dyslexia font. It is a unique 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 aloud 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.	Some websites 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.

## 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.

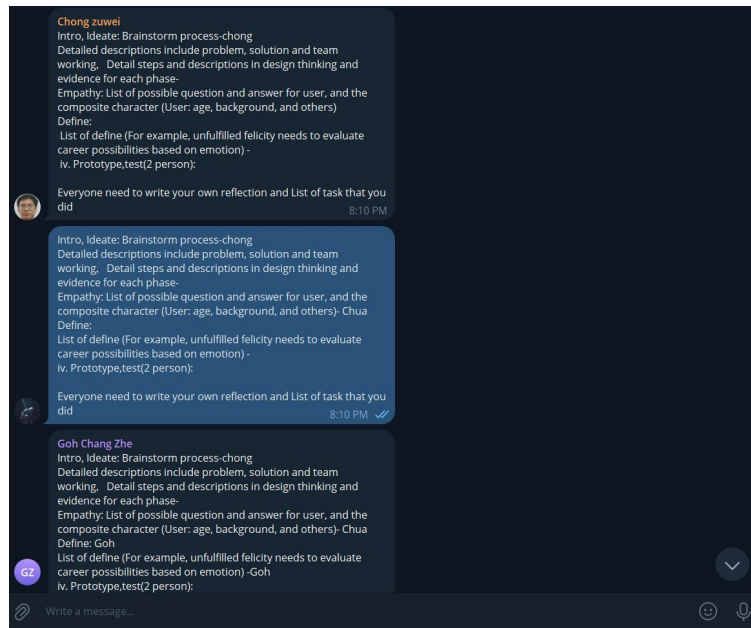
(130 words)

## Detail Step and Description in Design Thinking



(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 TIS course.



(18 January 2024)

Within the Telegram group, we distributed our tasks equally and clearly.

## Survey on the experience of people with disabilities or old people browsing the Internet

Hello everyone, this is a questionnaire to help UTM students complete a product assignment to improve the web browsing experience for people with disabilities. Family members of people with disabilities can also help people with disabilities fill out this form. I hope you can give us some time to help us understand user needs and feelings whenever web browsing. Your data will be kept confidential and your help is very important for us.

**B I U**

(19 January 2024)

Goh Chang Zhe prepared a survey using Google Form and distributed it to the public.

48 responses

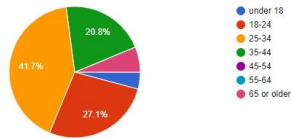
[Link to Sheets](#)

Accepting responses

Summary Question Individual

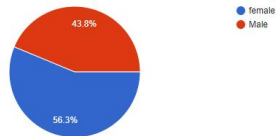
Your age  
48 responses

[Copy](#)



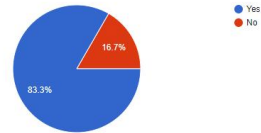
Gender  
48 responses

[Copy](#)



Do you have disabilities?  
48 responses

[Copy](#)



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

11 responses

Blurry eyes

physical

Eye-sight problem

Deaf

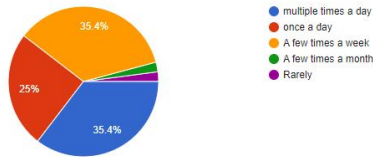
eye-sight problem

Physical

How frequently you use the internet?

48 responses

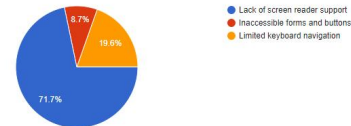
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What are the main challenges you face while browsing the Internet due to your disability?

45 responses

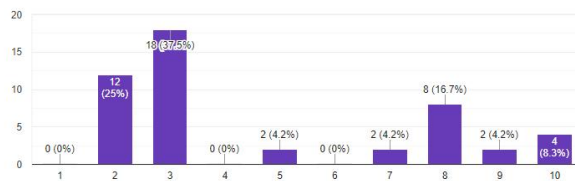
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On a scale of 1 to 10, how would you rate your overall satisfaction with the current accessibility of the websites you visit?

48 responses

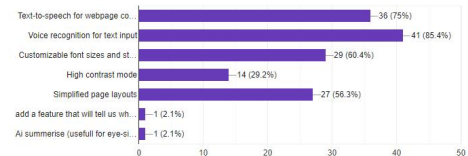
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Which of the following features would you find most beneficial in a web extension aimed at improving web accessibility for people with disabilities? (Select all that apply)

48 responses

[Copy](#)



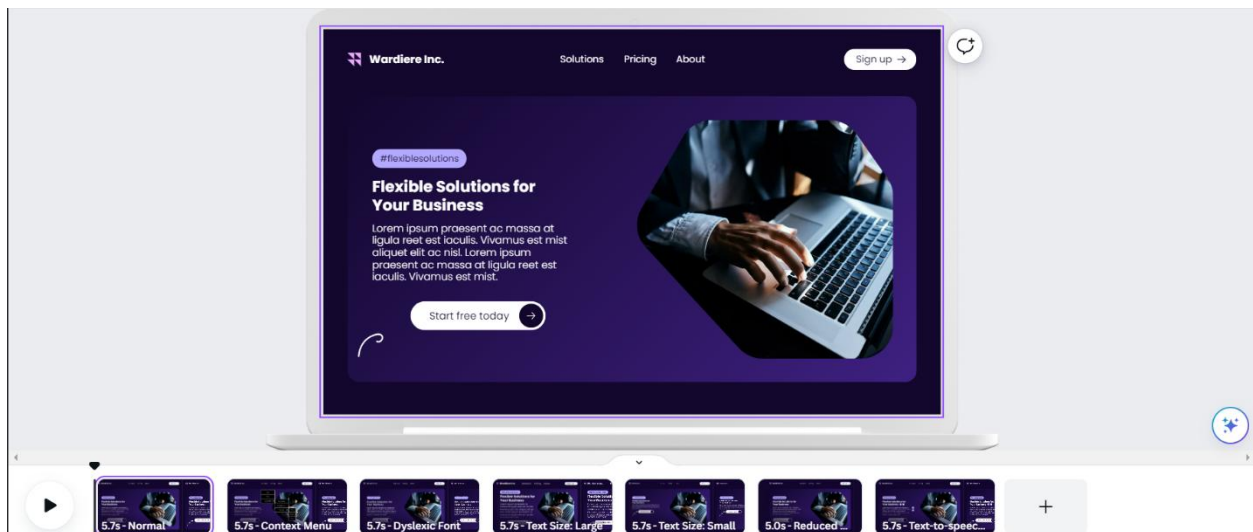
Is there anything else you would like to share about your experiences or challenges related to web accessibility?

8 responses

- no
- nothing
- Mobile phone software already has software to help people with disabilities, but those are aimed at using apps, not websites, so I hope there will be extensions or software that can help people with disabilities browse the web.
- Can make to be more easy to use
- No
- No, anything in good way
- hard to see clearly the screen of any electronic gadget

(23 January 2024)

The survey ended, and the answers were collected.



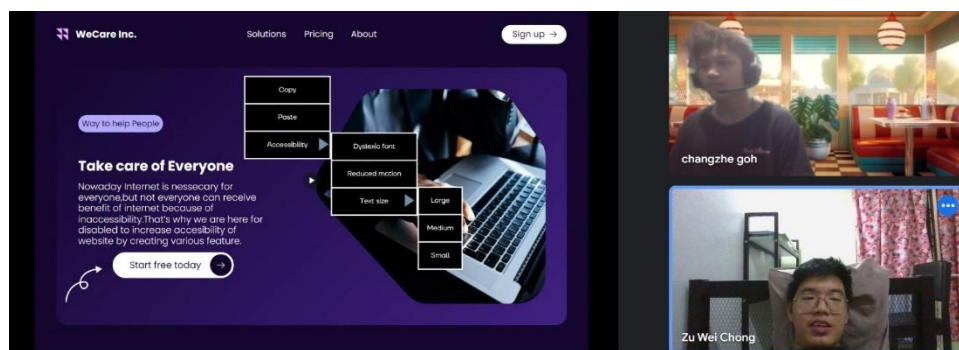
(26 January 2024)

The lo-fi prototype has been successfully built credited to Reza Mouna Hendrian and Fadhil Raihan Gunawan. The prototype has been tested by some target users.





The prototype has been tested by our group members.



Our progress timeline

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												
Conclusion/reflection												

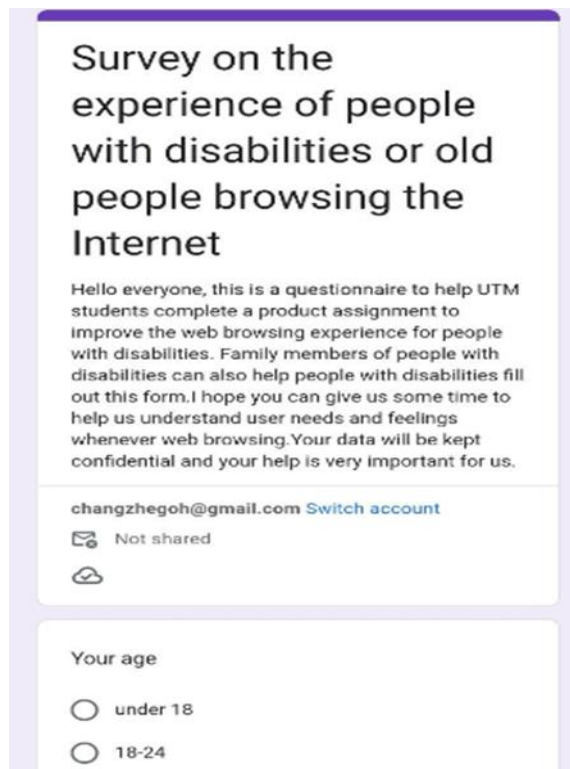
(118 words)

## 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.



The image shows a Google Form titled "Survey on the experience of people with disabilities or old people browsing the Internet". The form is set against a light purple background. The title is in a large, bold, black font. Below the title, there is a paragraph of text explaining the purpose of the survey: "Hello everyone, this is a questionnaire to help UTM students complete a product assignment to improve the web browsing experience for people with disabilities. Family members of people with disabilities can also help people with disabilities fill out this form. I hope you can give us some time to help us understand user needs and feelings whenever web browsing. Your data will be kept confidential and your help is very important for us." Below this text, there is a section for the user's email address, "changzhegoh@gmail.com", with a "Switch account" link. Below the email section, there is a "Not shared" status and a download icon. The form then asks for the user's age, with two radio button options: "under 18" and "18-24".

**Survey on the experience of people with disabilities or old people browsing the Internet**

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changzhegoh@gmail.com [Switch account](#)

Not shared

Your age

☐ under 18

☐ 18-24

**Image 11**  
Survey Homepage

(152 words)

## 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.

(169 words)

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.

**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.

# TIS O6 Brainstorming

Chapter 1: Emerging Technology in Information Communication Technology (ICT)

- Define a clear topic, then set a timer for 10 minutes to start the brainstorm. Copy and paste the provided sticky notes then type in your ideas. Add as many as you wish!
- After the allotted time, swap boards with the other team. Go through their board, then quietly move ideas that aren't feasible to the cutting room area.
- Have one teammate switch to the other group. Randomly pick a group number between 1-8. Scroll down to find the disrupt card that matches, then drag it to the board. Begin a new 10-minute brainstorm session. This time, factor the disrupt card into the original topic.
- Once again, swap boards, then silently go through the other team's "disrupted" ideas and remove the unfeasible ones.
- Do another 10-minute round of brainstorming with another team member switch and a new disrupt card.
- For the final cut, pick only the best ideas that you're ready to commit to, even if it means only 1 or 2 are left.

5. Reza Mouna Hendrian  
2. Fadhil Raihan Gunawan  
3. Goh Chang Zhe  
4. Chong Zu Wei  
5. Chua Shang Yeet

**Cutting Room**  
Discard ideas here

**Problem: Accessibility of Websites**

**Solution:** 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:** I introduce feature that can assist disabled people such as: "Customized" (text-to-speech) speech recognition, reduced motion, and more.

**Reza Mouna Hendrian**  
A23BC4395

**Problem:** Some websites have really small pictures or links or movable elements, making it difficult to tap accurately, especially for people with large fingers.

**Solution:** Design the website with large, touch-friendly buttons and controls to ensure easy and accurate tapping on movable devices.

**Fadhil Raihan Gunawan**  
A23BC4395

**Problem:** The media in some website may be linked to some website that is not related. Sometimes may tap the media and observed to the target.

**Solution:** Review the link address before redirected to the website to see the user if they really want to go to the website.

**Reza Mouna Hendrian**  
A23BC4395

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**Solution:** Review the

12 of 23

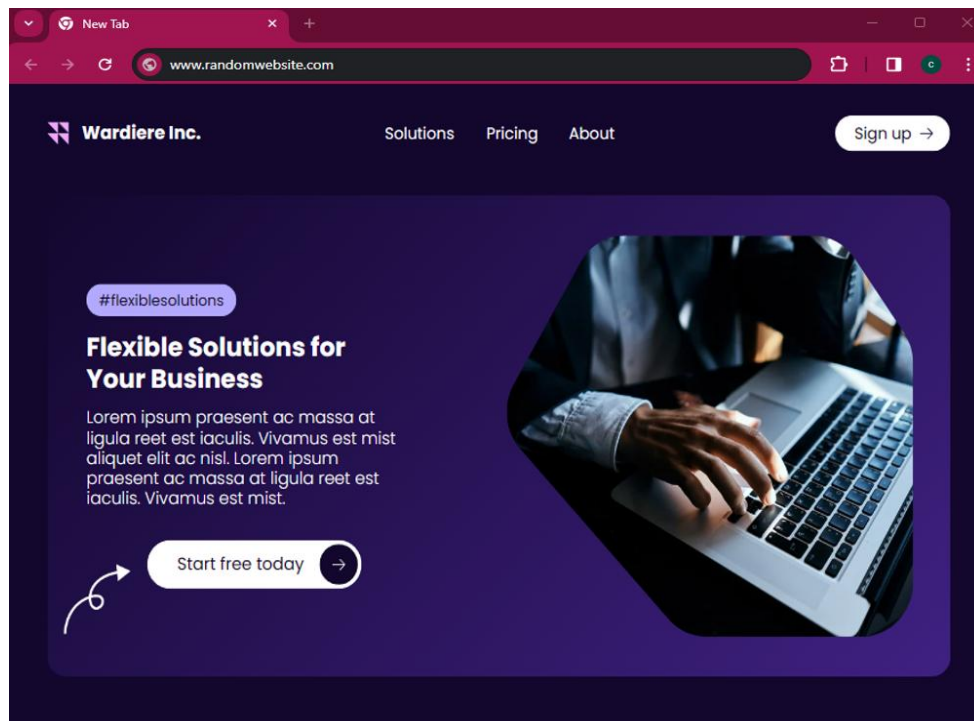
## Low-fidelity Prototype

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.

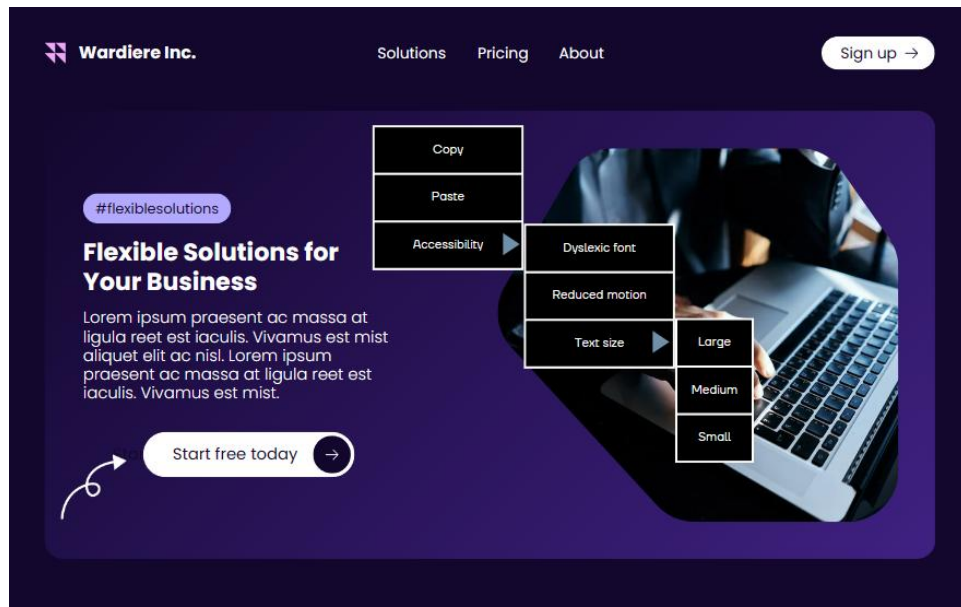
Our product emphasis on simple, effective, and direct button design, because our users are elderly or disabled, and providing help is our main goal. By incorporating these considerations into our design process, we create a prototype that effectively addresses the needs of our target users and provides a user-friendly interface for them.

(104 words)

## Test

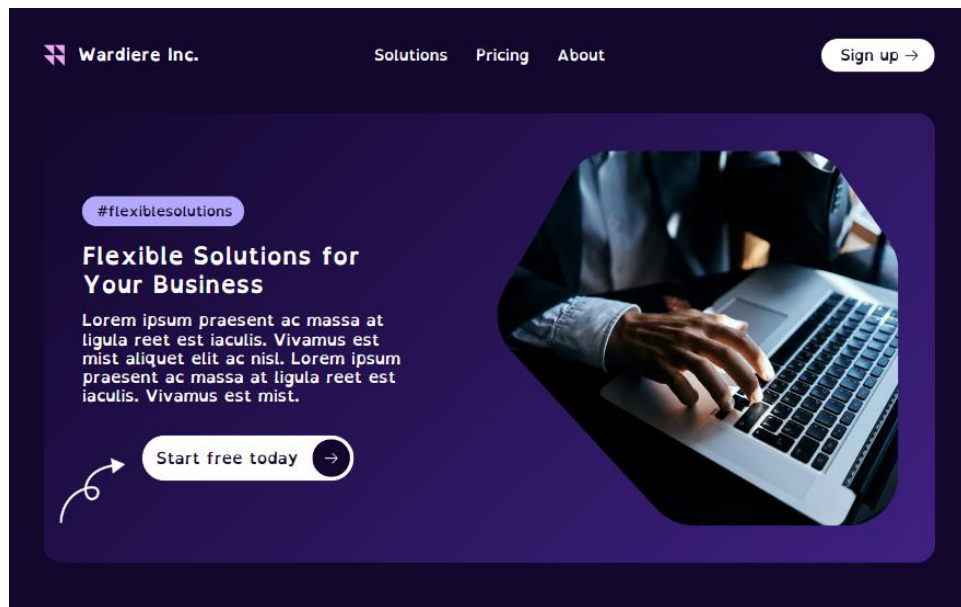


The image above shows the normal view of the homepage of a random website. To access the accessibility menu, the website implements a context menu that is accessible via right-click on desktop or hold on mobile devices. By default, the size of the text that is displayed on the website is medium. Toggling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



**Image 13**  
Context Menu in Website

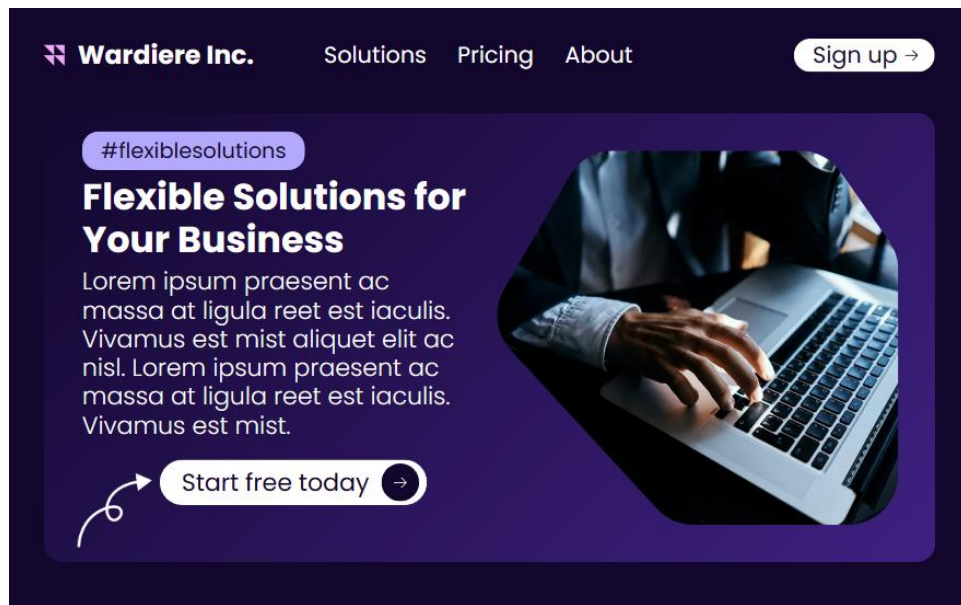
When enabling dyslexic font, all fonts of the website are replaced with the Open Dyslexic font, which is a font family that is intended for dyslexic users.



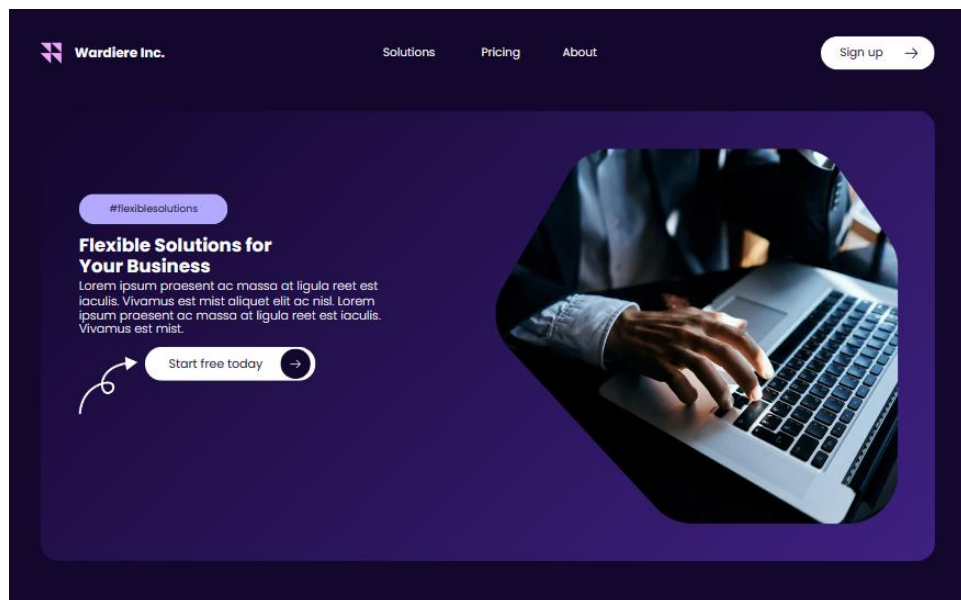
**Image 14**  
Website with Dyslexic Font

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



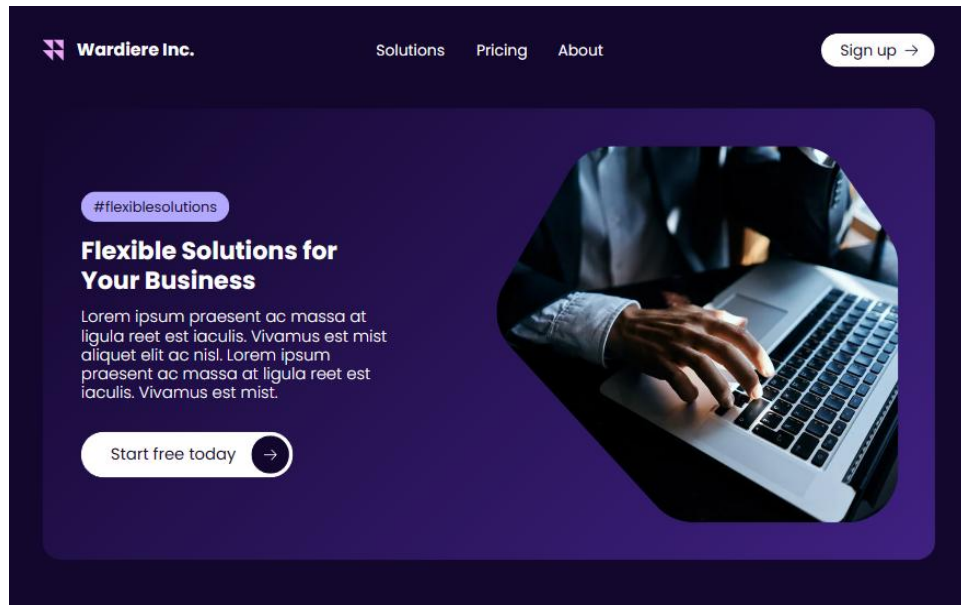


**Image 15**  
Website Homepage with Large Text Size



**Image 16**  
Website Homepage with Small Text Size

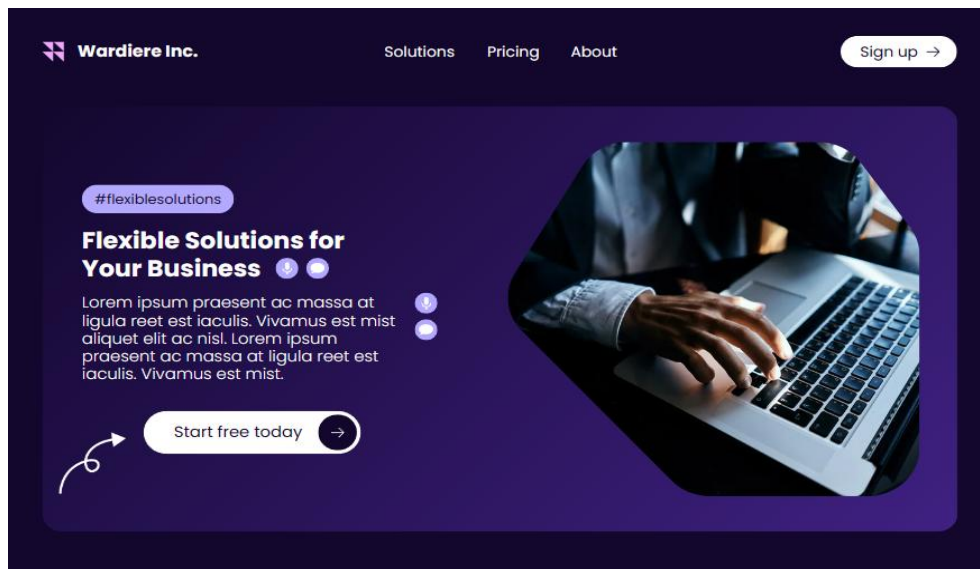
Reduced motion is another key accessibility feature that helps users with motion sickness. By enabling it, all animations on the website are removed. In our prototype, the arrow that points to the button has an animation. When reduced motion is enabled, the arrow is removed.



**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

(275 words)



## Reflections



Goh Chang Zhe

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 apply those 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.

(146 words)



Chong Zu wei

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. Besides that, I also make up my mind to participate in hackathons and improve my knowledge, so it is easier for me to find a job in the future.

From this design thinking project, we realized that design thinking encourages thinking outside the box, and this mindset can help us come up with innovative ideas. Besides that, we also know how to create an application that can solve their problem and what steps you need 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. Besides that, stay informed about the latest trends and advancements by following tech blogs and being part of online communities.

(155 words)



Chua Shang Yeet

The goal regarding the TIS course, 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 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, so I have the skill to face a variety of challenges in the industry.

(164 words)



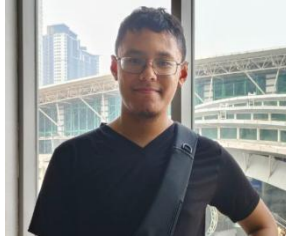
Fadhil Raihan Gunawan

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.

(134 words)



Reza Mouna Hendrian

I want to become a software engineer 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. They must adhere to the software development life cycle. 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 important to gain an initial grasp of the design desired by customers. It reduces the chance of wasted effort and time.

I must keep learning. Technology is evolving rapidly, and I will be left behind if I do not keep up. Apart from that, creating more projects allows me to apply my knowledge to build something, which I have done many times. However, I need to continue doing so to improve and expand my knowledge in the huge world of software development.

(165 words)

(Total word:1860)

### Task Distribution

Tasks	Goh Chang Zhe	Reza Mouna Hendrian	Fadhil Raihan Gunawan	Chua Shang <u>Yeet</u>	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	/	/	/	/	/

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