



SCHOOL OF COMPUTING
Faculty of Engineering

Technology & Information System
SECP1513 – 10 SEMESTER I 2020/2021

DESIGN THINKING REPORT

Team 5 (Anonymous)

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SUBMISSION DATE : 16th NOVEMBER 2020

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intro- **DUCTION**

----- to the research

1.0 INTRODUCTION

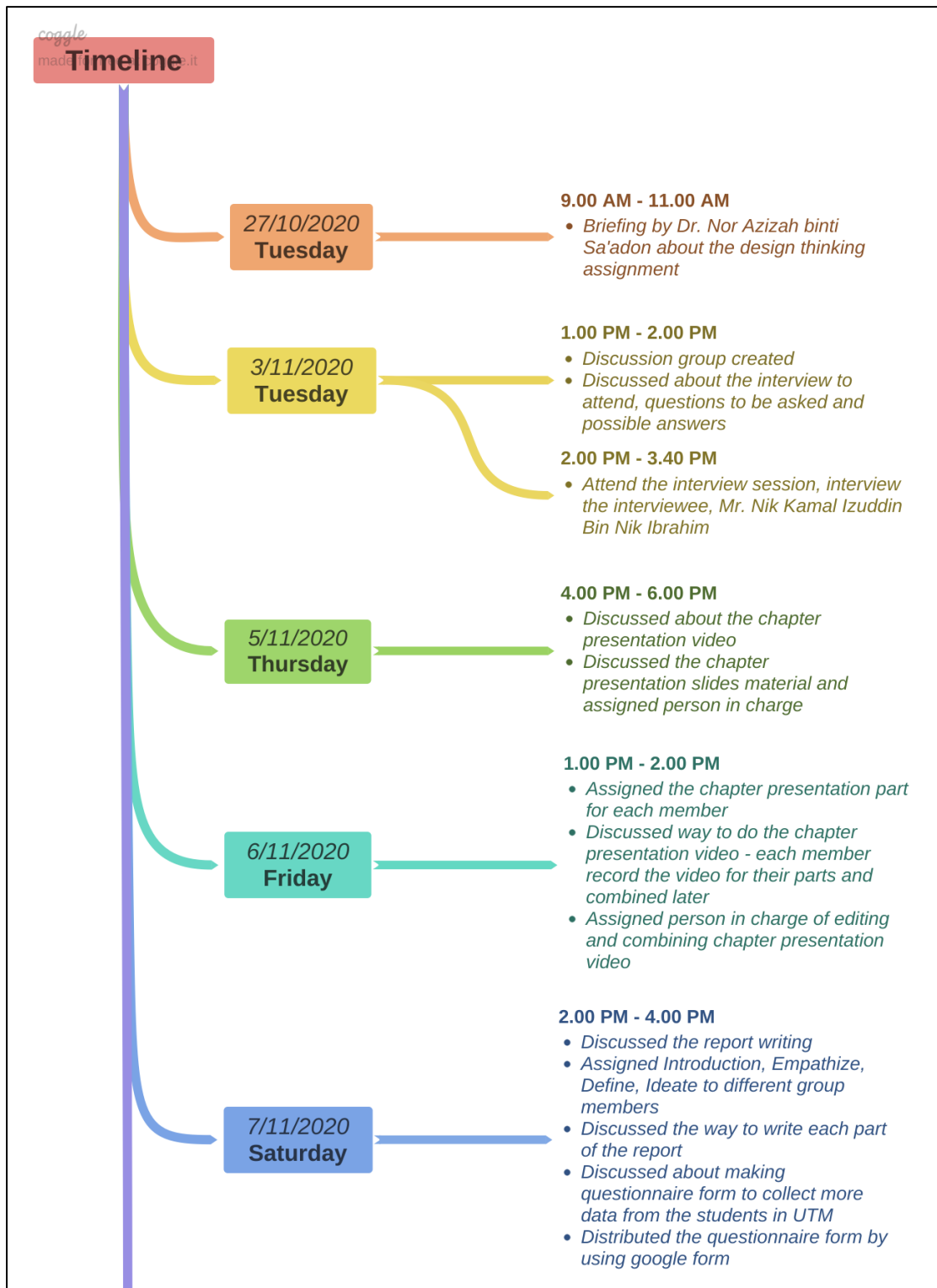
Design thinking is a design method to solve problems using a solution-based approach. Complicated issues that are uncertain and not well described can be tackled with ease using this method. It can also be helpful when we consider the individual needs involved and coming up with several ideas in our brainstorming process. There are five stages in design thinking, understanding and applying these stages can help us complete complicated challenges. The five stages of design thinking are empathize, define, ideate, prototype, and testing. We interviewed experts in UTM digitals and prepared a survey for UTM students to solve the problem regarding input and output system. We prepared a series of questions about audio input to the experts and our respondents. From the interview and survey, we identified that they are mostly facing the same problem which is complex action cannot be performed by using audio input in software such as Photoshop, AutoCAD, Microsoft Office etc. After our discussion, we decided to create a voice control interface like Siri from Apple on this basic working software to make audio input process more effective.

detailed- **STEP**

----- descriptions

2.0 DETAILED STEPS & DESCRIPTIONS

The detailed steps and descriptions of our progress can be seen in figure below.



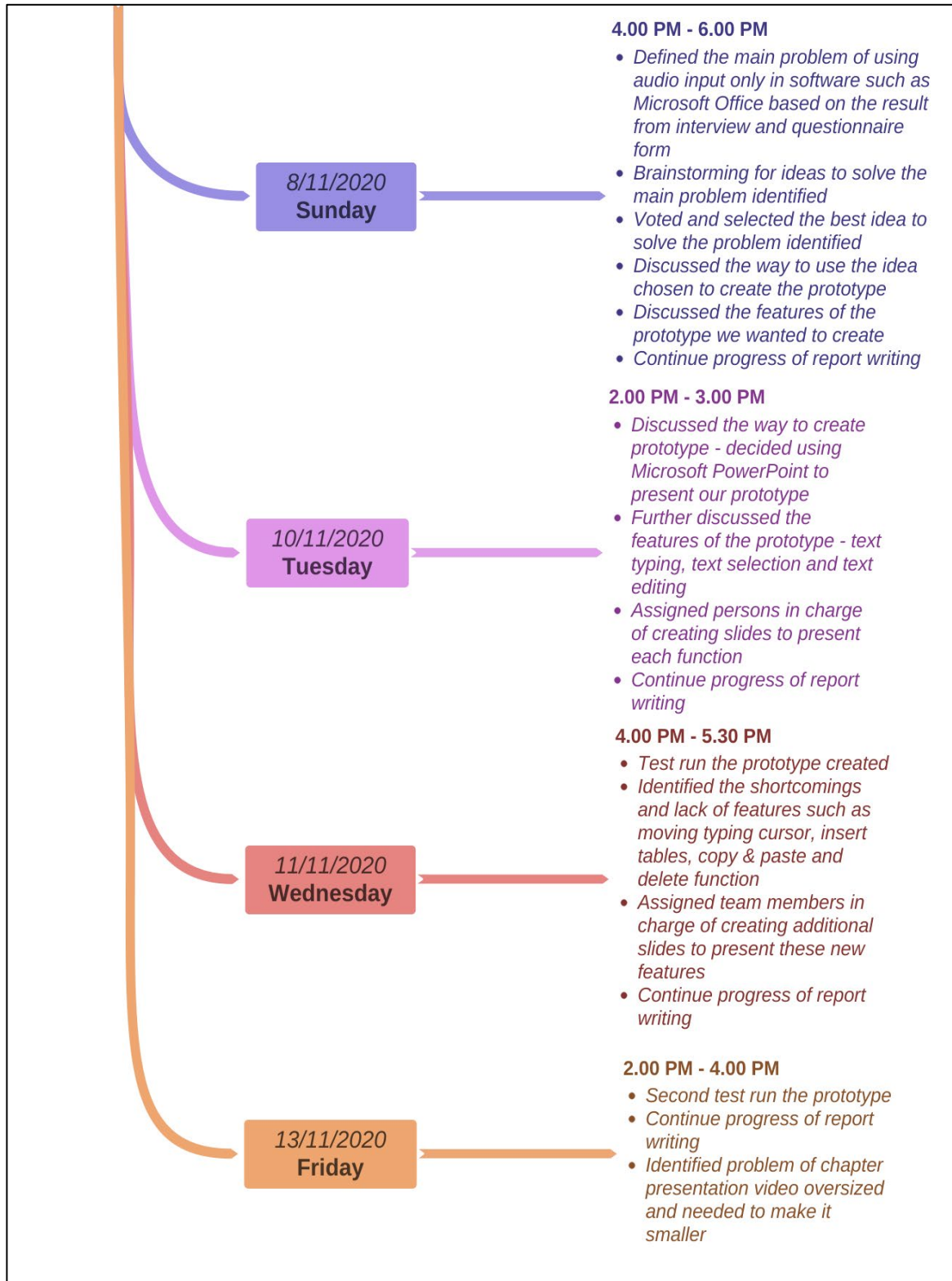


Figure 1: Log journals of recording progress

detailed

DESC-

----- rptions

3.0 DETAILED DESCRIPTIONS

There are 5 phases in design thinking which are empathy, define, ideate, prototype, test.

3.1 EMPATHIZE

In empathize stage, we obtained empathic understanding of the problem by immersing ourselves in users' perception. This helped us make the best approach to tackle user's problem. Interview session is the first step of empathize. We collected respondent's personal information, problems encountered and feedbacks. For example, we asked the respondent's background such as name, title, and division, the problems faced when using audio input in daily life. We interviewed an expert from UTM Digital and identified the problem he faced when using audio input as replacement to traditional inputs in software such as Microsoft Office, Autodesk AutoCAD and Adobe Photoshop. Besides, we also did questionnaire form to the students of UTM about the problems they faced when using audio input in daily life and the problems might be encountered when using audio input only in the software mentioned above to identify the most impact problem based on the responses.

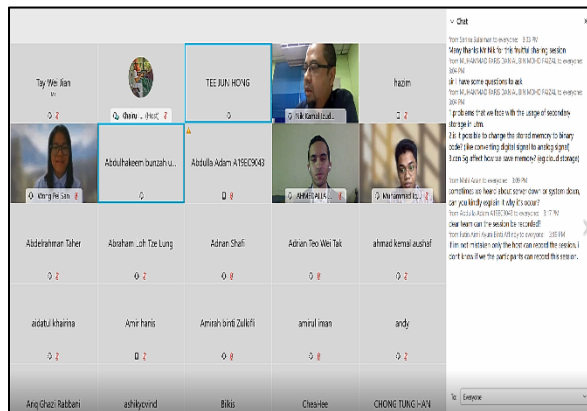


Figure 2: Asking question to the Mr. Nik Kamal Izuddin Bin Nik Ibrahim



Figure 3: Mr. Nik Kamal Izuddin Bin Nik Ibrahim answering the question



Figure 4: Information about Mr. Nik Kamal Izuddin Bin Nik Ibrahim

Figure 5: Part of questionnaire form created by using Google Form

3.2 DEFINE

We list down the problems faced by the respondent if using audio input only in software mentioned above in the define process and tabled them in the table below.

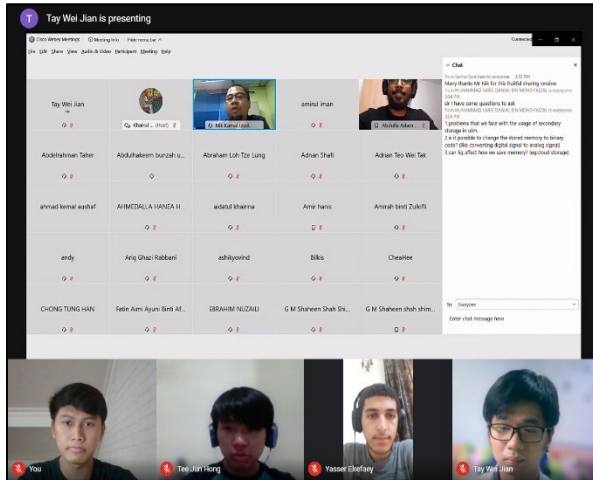


Figure 6: Replay the interview session video

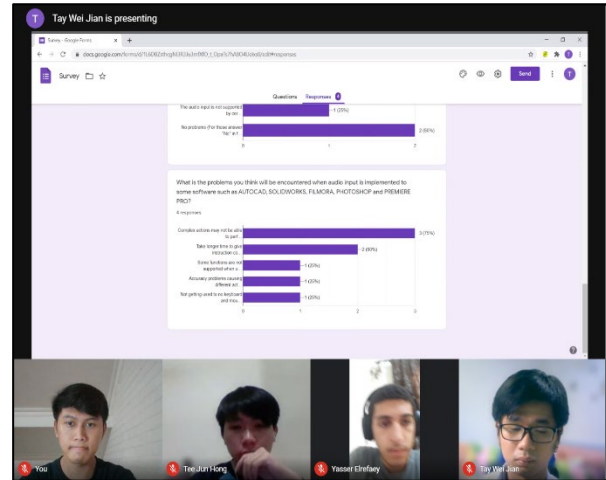


Figure 7: Review the responses collected from the respondents of questionnaire form

Problems Respondent	Complex actions may not be able to perform	Take longer time to give instruction compare to using keyboard and mouse	Some functions are not supported when using audio input	Accuracy problems causing different actions to be performed	Not getting used to no keyboard and mouse input
1	✓		✓		✓
2	✓				
3		✓			
4	✓				
5	✓	✓	✓	✓	✓

Table 1: Problems faced by the respondent from the various area if the audio input implemented in software

According to the table above, we identified that perform complex actions through audio input only in these software is the major problem. There are thousands of functions available in these software programs, using solely audio input is difficult to perform complex and precise action. Besides, current existing audio input has limited function in these software. For example, the built-in audio input function for Microsoft Word is only limited to typing words. Therefore, we set perform complex actions through audio input only in these software is the major problem.

3.3 IDEATE

In this stage, we had a brainstorming session where we contributed our ideas to solve the problem above. After discussion, we came out several ideas and stated our ideas in Google Jamboard. After that, we voted and selected the best solutions. The ideas to solve the major problem for UTM students identified during define stage are the followings:

No.	Ideas
1	Design an extension to the existing software to support audio input to perform functions of the software and eye-tracking.
2	Develop a voice control system in any office tools for basic operations like typing and searching for pictures.
3	Make the audio input usable in various software by designing in detail for a complex thing.
4	Design an audio input system that supports most languages.
5	Design an advanced robot to carry out design tasks that can receive audio input.
6	Create a new software similar to existing software but with built-in support audio input function.
7	Design a voice control interface similar to Apple Siri on basic office tools.
8	Improve and update the audio input usability function.
9	Adding basic navigation using audio input on our computer.

Table 2: Ideas generated during stage of ideate

After our discussion and voting session, we decided to use idea number 7 which is designing a voice control interface similar to Apple Siri on basic working tools that we usually use for instant Microsoft Office.

Firstly, we discuss the user interface of this program we can add a “voice command” on the toolbars that the software we are using. When we select the toolbars the software will automatically switch to voice control mode.

Next, we discuss the command that we can do using sound control in Microsoft Office. The system should have a text selection voice command where we can select the text desired

besides word typing only. Lastly, we decided to add a text editing and deleting option where users can edit their text by copying, pasting, cutting, replacing other text, and delete the text desired.



Figure 8: Team members using Google Meet during the process of ideate

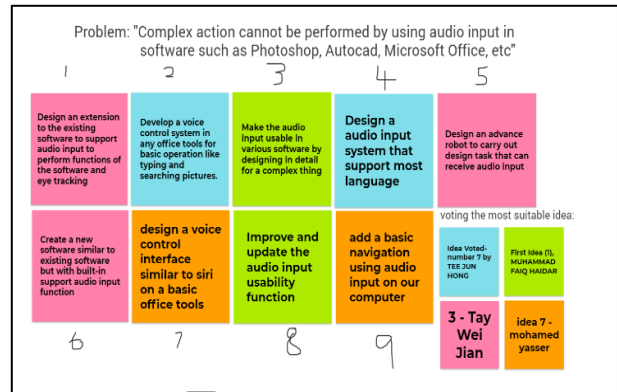


Figure 9: Ideas generated and voting result during the ideate stage by using Google Jamboard

3.4 PROTOTYPE

A prototype is the most suitable solution that we selected from the 9 ideas in our brainstorming process. We decided to design a voice control interface similar to Apple Siri on Microsoft Office. We designed our voice control interface using Microsoft Powerpoint and also presented each of the effects of voice command using it. A total of 39 slides had been created and these slides present voice command in typing function, text selection function, insert function such as insert tables and shapes, text editing function such as changing font type, delete, copy and paste, and moving typing cursor function.

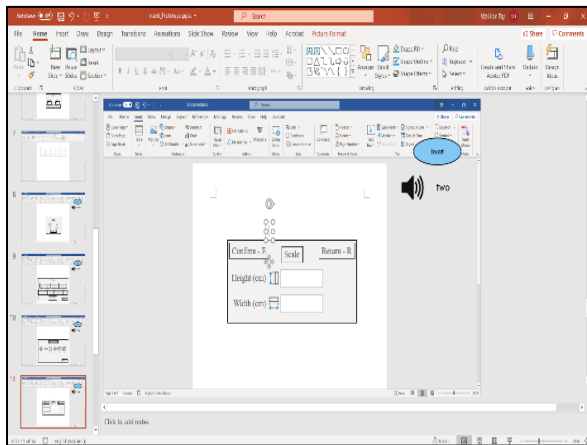


Figure 10: Group member, Tay Wei Jian creating prototype of insert table function

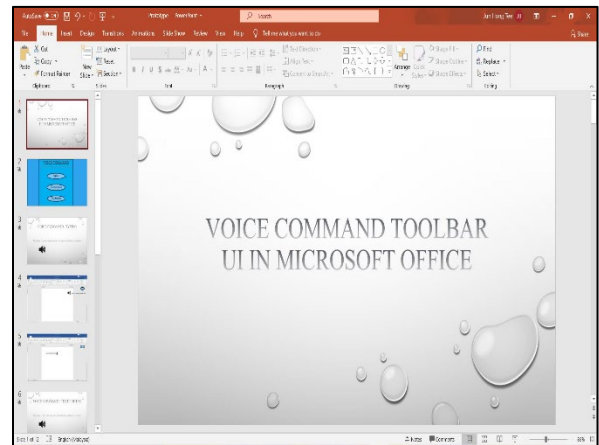


Figure 11: Group member, Tee Jun Hong creating prototype of voice command toolbar UI

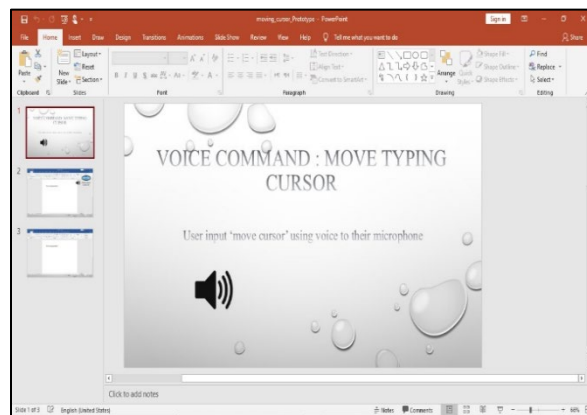


Figure 12: Group member, Mohamed Yasser Elrefaey creating prototype of moving typing cursor function

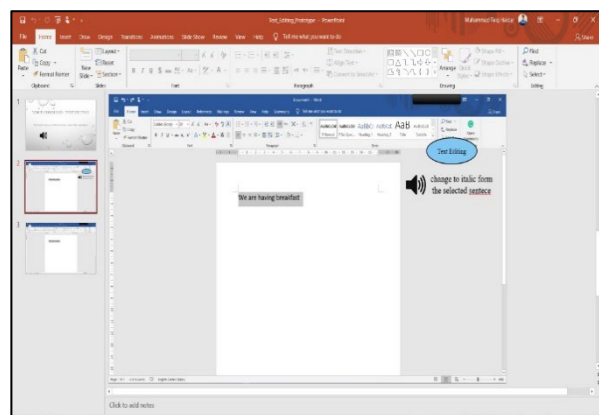
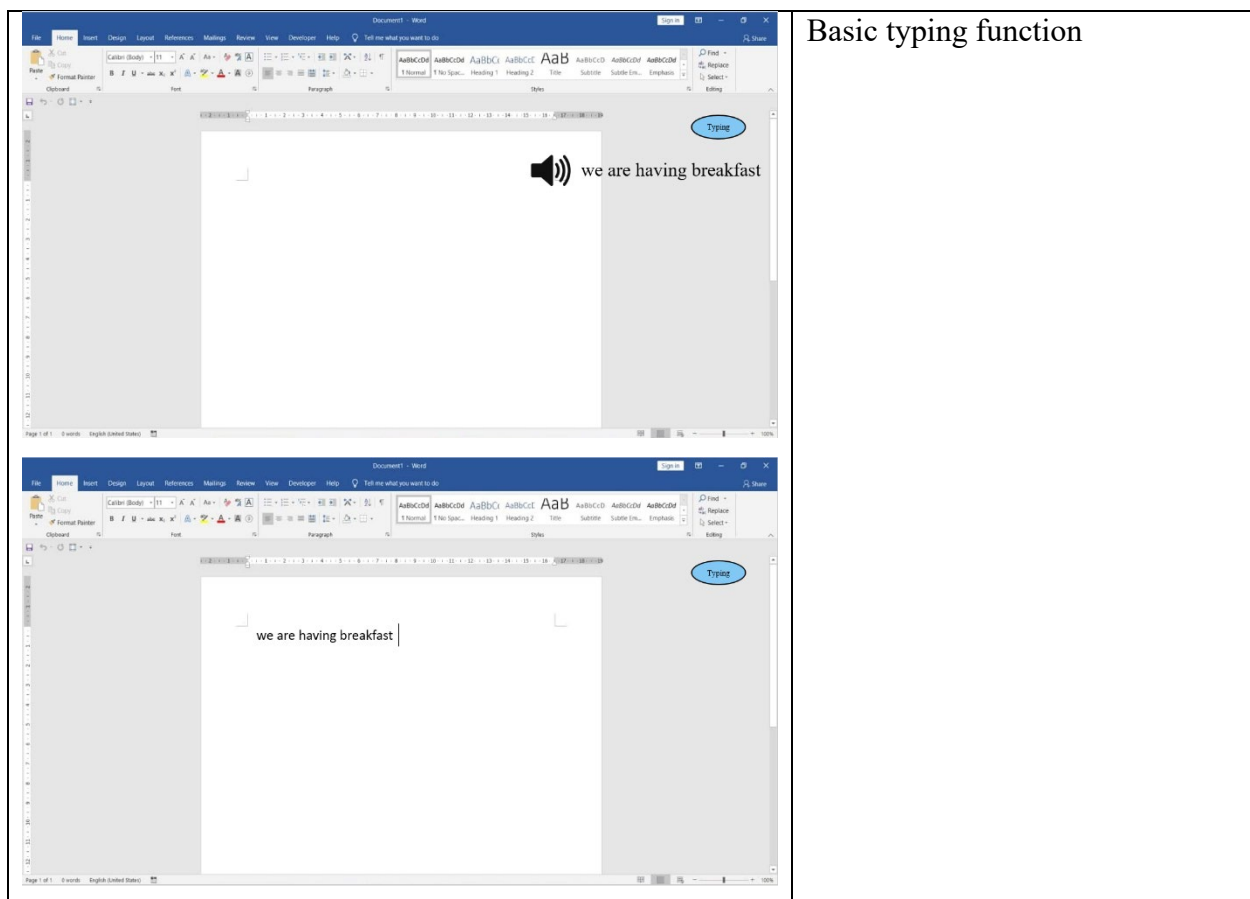
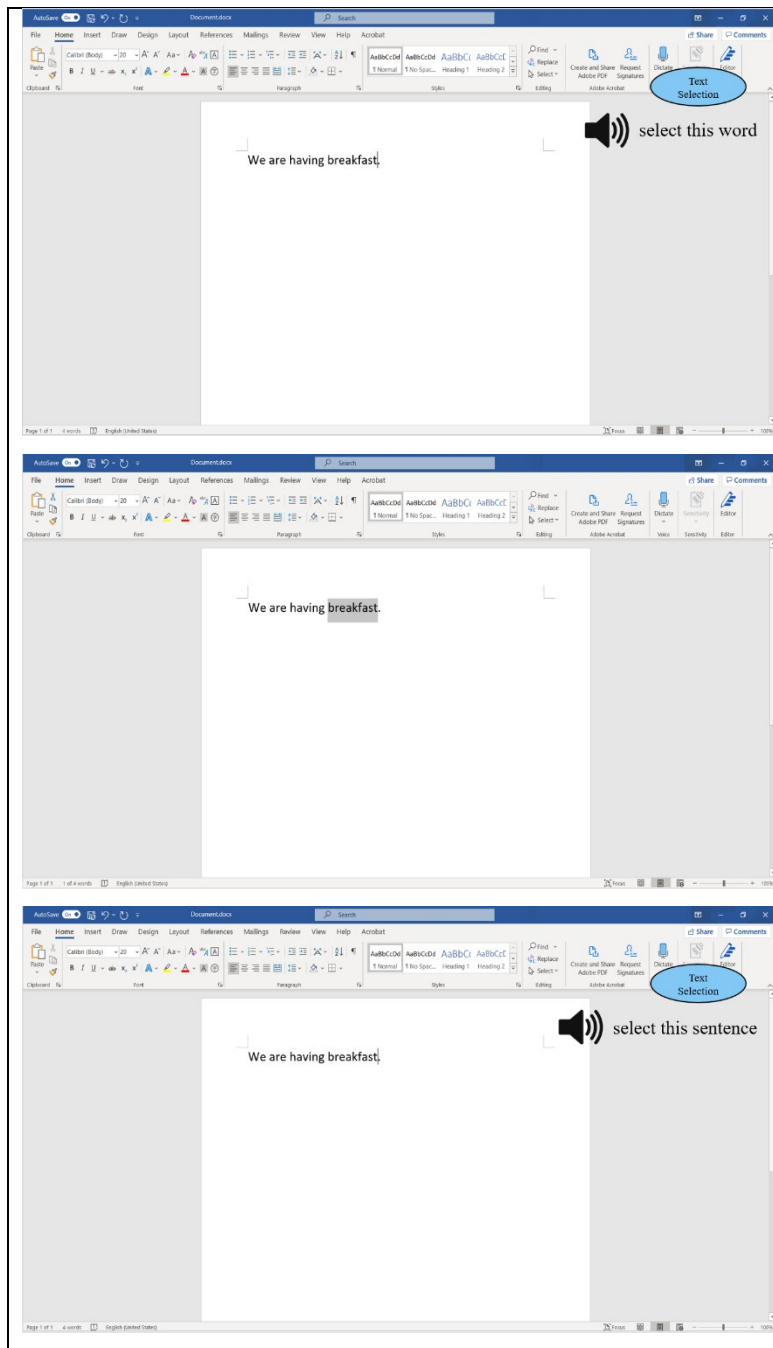


Figure 13: Group member, Muhammad Faiq Haidar creating prototype of text editing: change to italic function

3.5 TEST

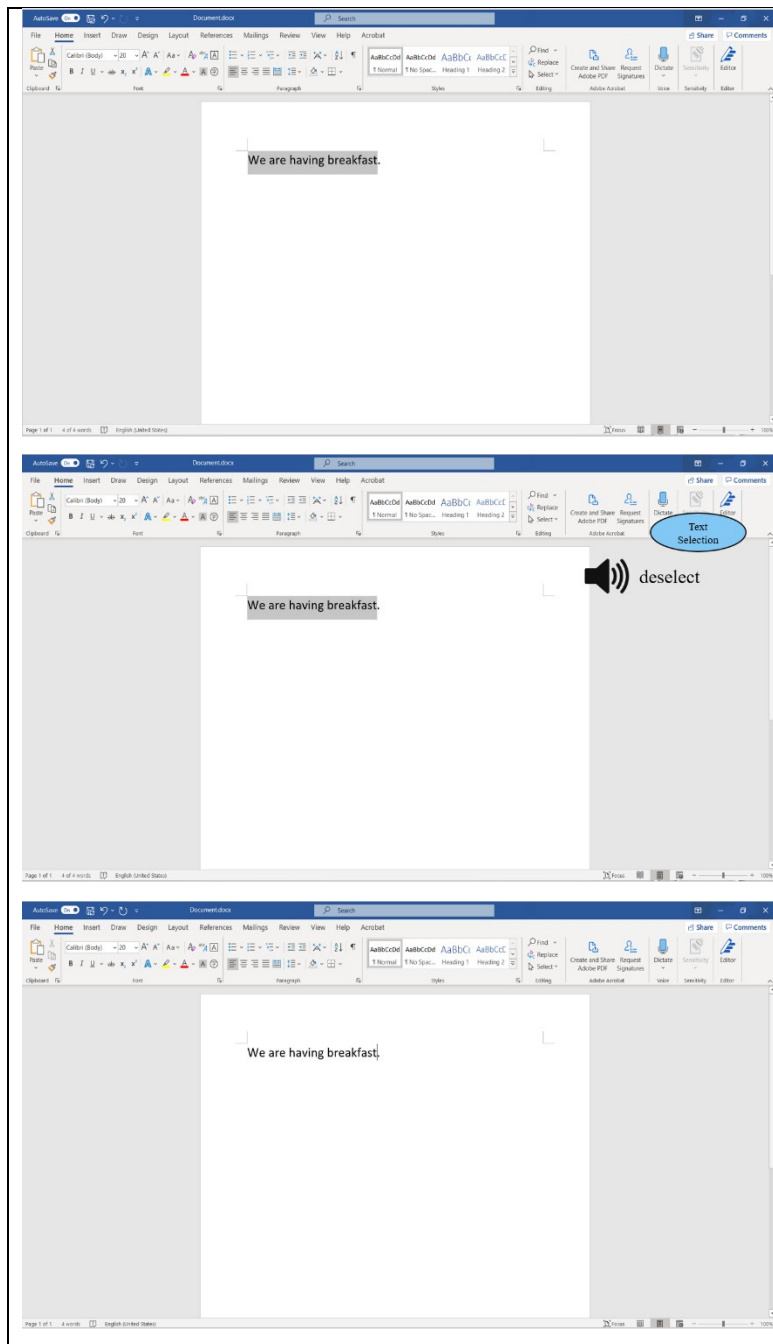
In this stage, we tested our prototype to determine whether we achieved the results we wanted and obtained feedbacks that will help us identified potential innovation and keep on improving existing prototype to perfectly solve users' problem. In our first test we found out that we don't have enough features to fulfill users' needs, and we had to add more features. After several improvements, the prototype successfully fulfilled the users' needs.

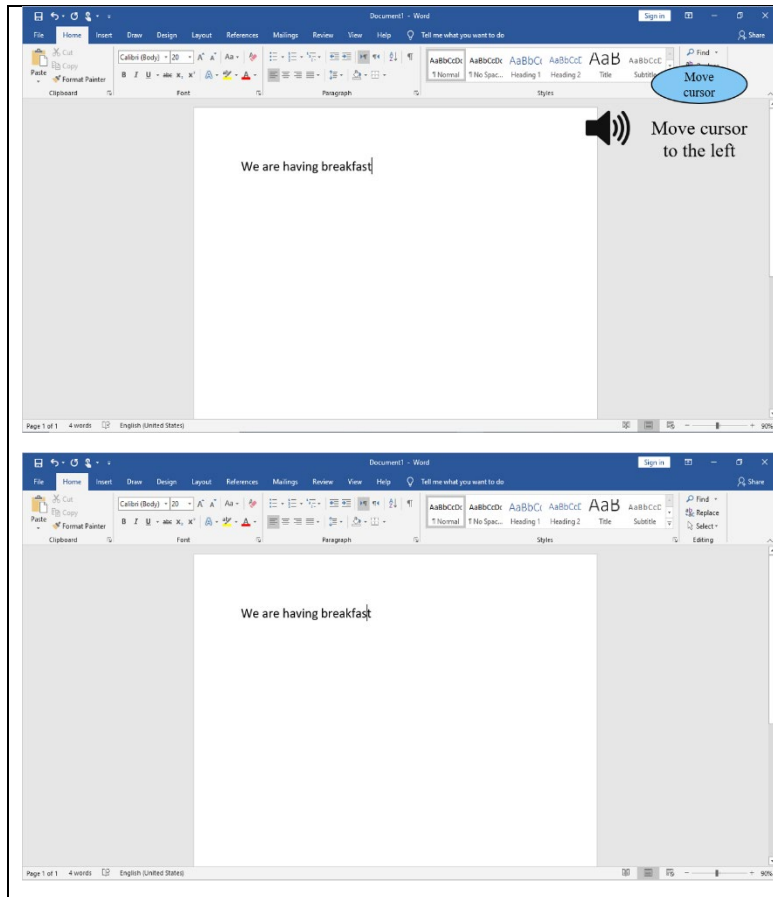




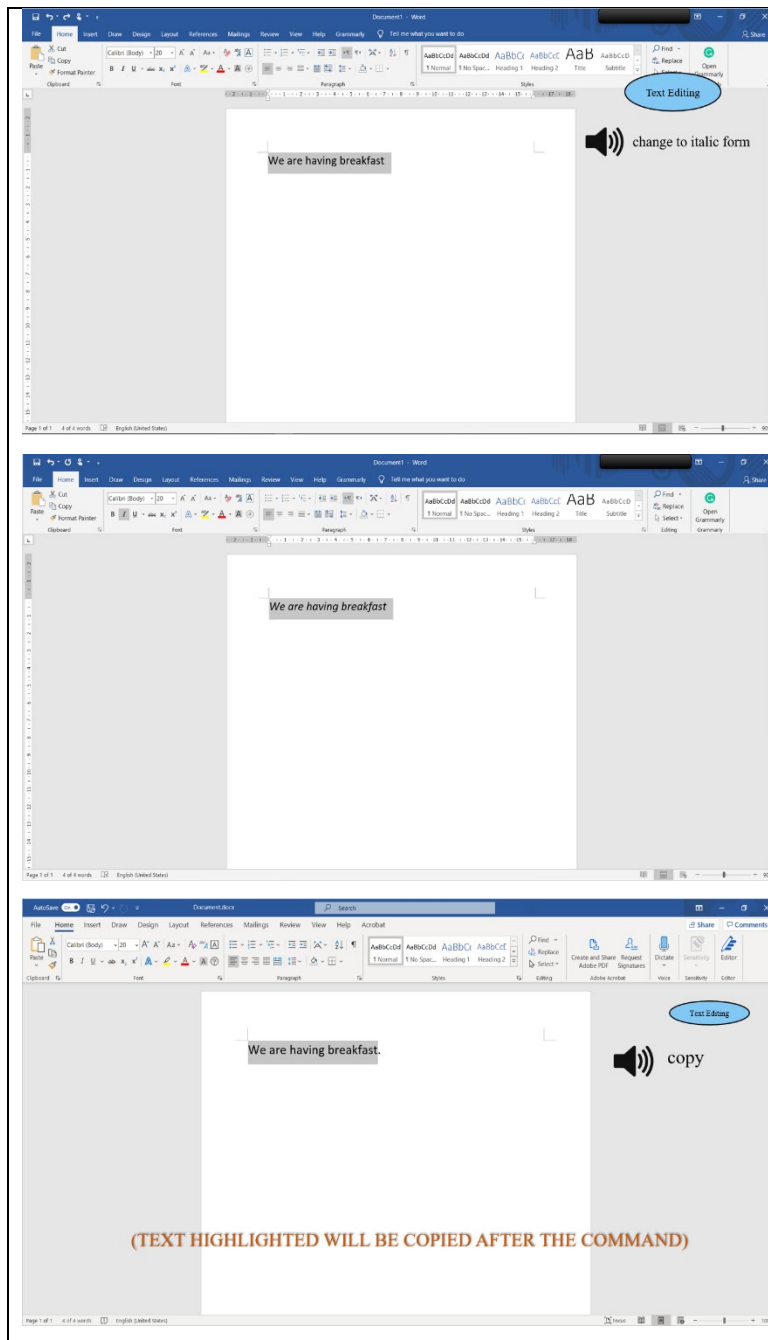
Text Selection Function:

- Select word
- Select sentence
- Deselect



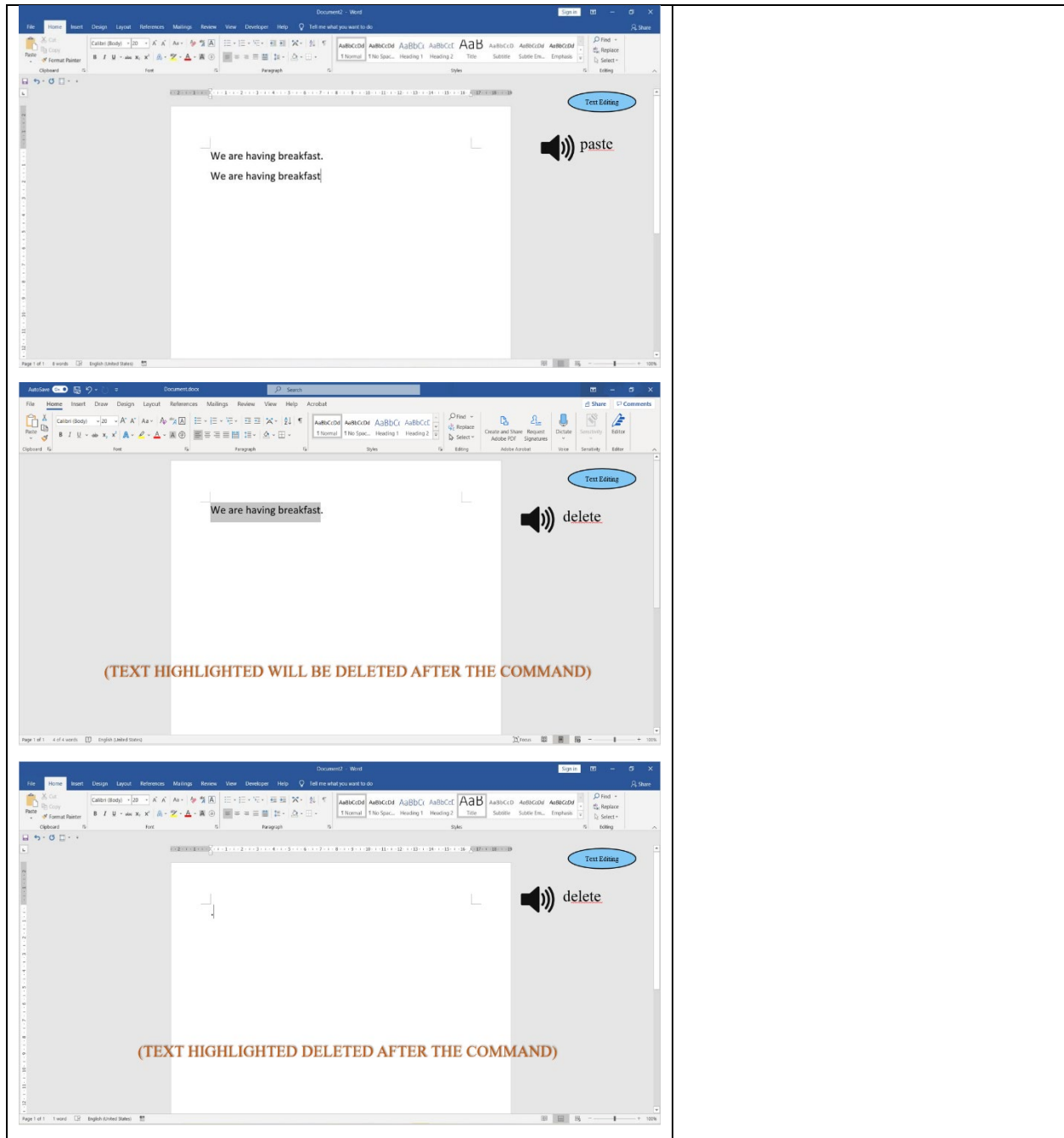


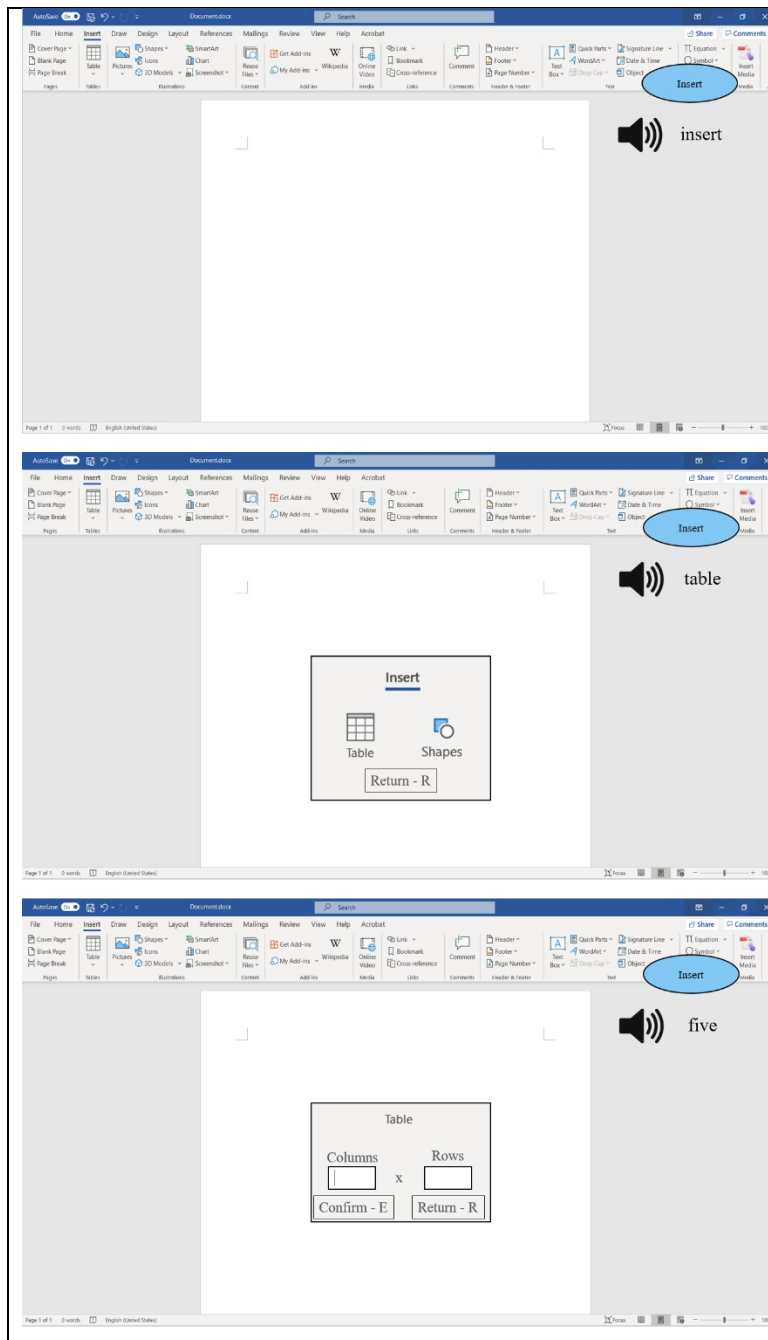
Basic moving typing cursor
function



Text Editing Function

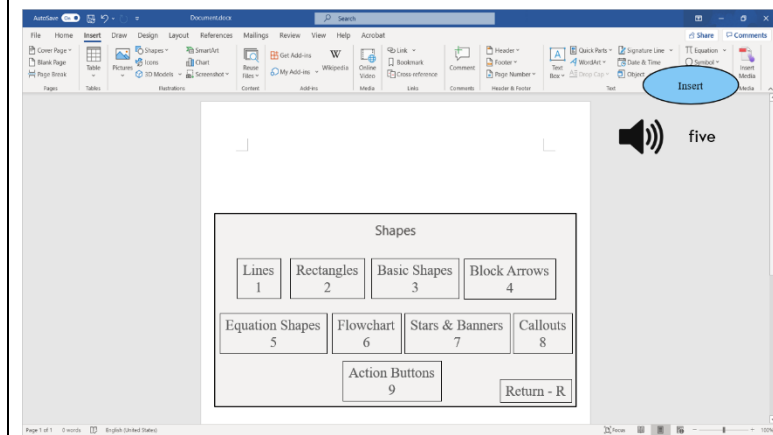
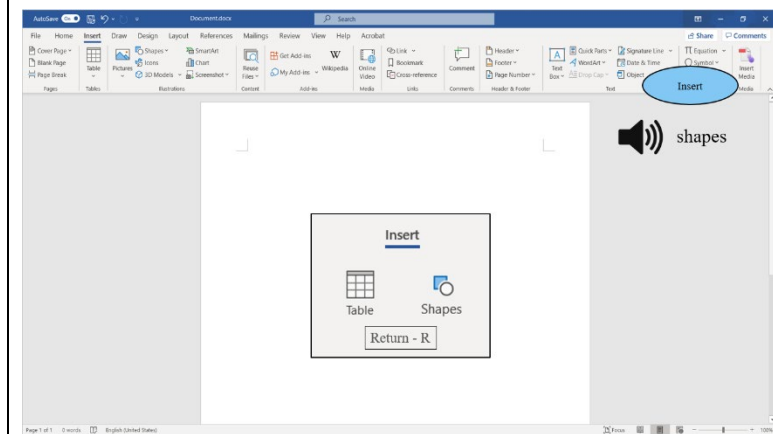
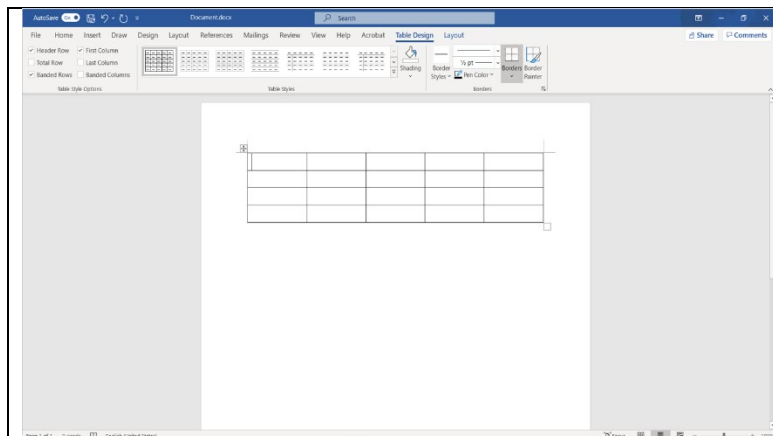
- Change font type
- Copy & paste
- Delete





Insert function

- Table
- Shapes



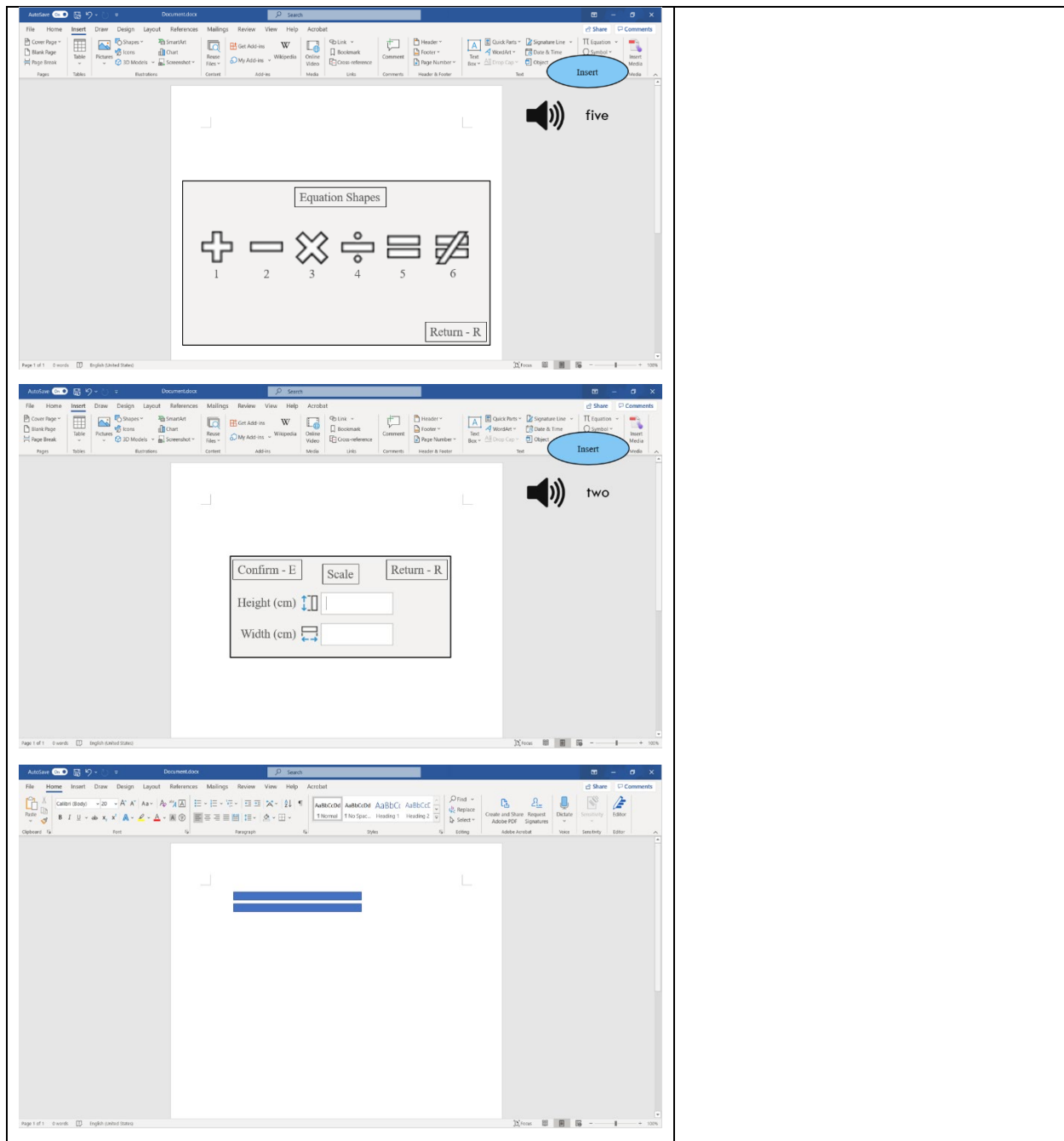


Table 3: Functions of the prototype created and the demonstration of each function

pro-

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4.0 PROBLEMS

There were many problems we faced during the making of this assignment. Our first and most impactful problem was the pandemic resulting the university temporarily closed. This caused inconvenience as we couldn't meet each other to work on this project because we are all not staying in the same city. For example, we had to make sure that all parts of the report, video, and prototype, etc. are in synced and only had slight differences compared to other members' work. Other than that, we also had time zones problems since we are not staying in the same country. Another problem we faced was that we had a different point of views at some points, which isn't a bad thing since it helps us improve our prototype until it made all the members satisfied with the result.

assess-

----- **ment**

5.0 ASSESSMENT

Our teamwork is very visible in our group. Even though we had miscommunication for one week, we could still do our assignments well. At the time of the Covid-19 pandemic, this did not become a barrier for us to continue learning to do research. We were assisted by several supporting applications to conduct research for time control and virtual discussions. We had done our best to solve the problem with innovative solutions through a list of questions that will be asked of several users and our work has received good responses from our respondents. During discussions via social media to create design thoughts, our team's detailed plans executed smoothly. For example, we successfully completed our interviews with four respondents in one to two days even though we had many assignments from other subjects. Due to teamwork, we were able to shorten the time to complete this project.

reflect-

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6.0 REFLECTIONS

6.1 TAY WEI JIAN

My goal for taking this course is to have more detailed knowledge about current IT from software to hardware and dream for creating multimedia software after completing this program. Design thinking help me to understand every creation needed to undergo necessary stages. The most important mindset is users over profits throughout the process of creating new things to achieve users' expectation. Therefore, I need to start learning to always empathize on users' need to create products that benefit both users and company in the future.

6.2 MUHAMMAD FAIQ HAIDAR

My dreams for taking this course are to get more knowledge and experience in this subject. This will help me understand more about this subject. So, I will be able to determine a precise and accurate future. Design thinking helps me solve problems. By following each step I can think outside-the-box and try to do new things. It also allows me to build confidence, consistency, and independence in handling every task, especially my soft skills. Therefore, I will try to be more confident in achieving my life dreams and succeeding in this world and the hereafter.

6.3 TEE JUN HONG

My goals for taking this course is to have a more understanding into the world of creating animations and games using IT knowledge. Design thinking helped me to have more proper understanding about the process to design and produce these softwares. These steps in design thinking also assisted me to solve complicated problem in a effective way. In order to have a success future in this industry it is important for me to think out of the box and be creative. Therefore, I need to improve my thinking skills to create my own unique product.

6.4 MOHAMED YASSER ELREFAEY

My main goal for taking this course is to gain new experience and knowledge in IT skills. To help me understand more about software and hardware, for the end goal of one day creating my own software application. This course will help me with solving problems that's related to the topic. and to do that I got to work on and adapt new ways of thinking in a creative mindset. it will always be my main focus, and I'll keep improving until I can be confident enough to create a system that will be help people one day.

the task
FOR EACH
----- member

7.0 THE TASK FOR EACH MEMBER



Tay
Wei Jian

Interviewer	Brainstorming
Slide maker	Presentation Part IV
Emphaty	Report Editor
Define	Meeting Logs
Prototype	Design Thinking Evidence



Muhammad
Faiq Haidar

Prototype	Designer
Presentation Part I	Videographer
Brainstroming	Assessment
	Slide maker
	Report Editor



Tee
Jun Hong

Interviewer	Ideate
Slide Maker	Presentation Part II
Introduction	Brainstorming
Videographer	
Prototype	



Muhammad
Yasser Elrefaey

Problem Analysis	Test Report Writing
Prototype	Detailed description
	Presentation Part III
	Reference of video

REFERENCE

1. Rikke Friis Dam & Teo Yu Siang (2020, August) *5 Stages in Design Thinking Process*, from Interactive Design Foundation: <https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process>