



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

SECP1513-04 J

SEMESTER I 2023/2024

TECHNOLOGY & INFORMATION SYSTEM

DESIGN THINKING FULL REPORT

**SMART CITY - IMPROVEMENT OF JOHOR BAHRU'S
PUBLIC TRANSPORT SYSTEM**

GROUP: WE TECH

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Table of Contents

Introduction.....	3
Project Timeline.....	4
Empathy.....	11
Prototype.....	14
Test.....	15
Reflection.....	18
Task Distribution.....	21
Reference.....	23

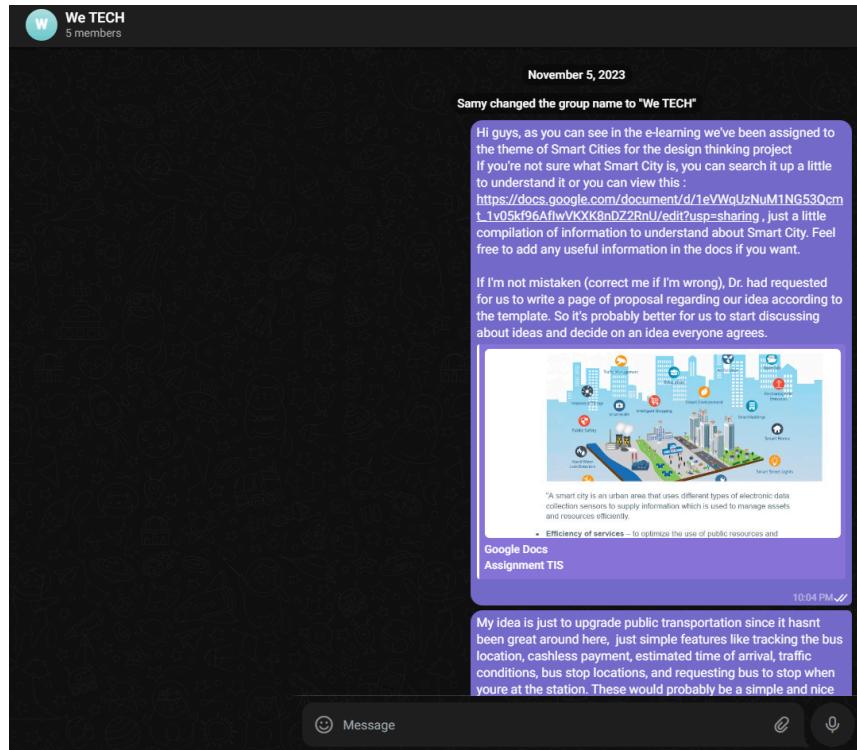
Introduction

Johor Bahru is experiencing a rapid increase in population due to its strategic location and rapid development. We Tech is targeting clients who use and practice public transportation on a daily basis. The rapid growth of the population necessitates the implementation of public transportation, however, the initial planning of the city has ruled out the use of trains as the primary form of public transport, similar to Kuala Lumpur. Therefore, public buses are the primary medium of public transport. We Tech is committed to improving the efficiency and reliability of the public bus system in JB, in order to improve the citizens' quality of life.

Project Timeline

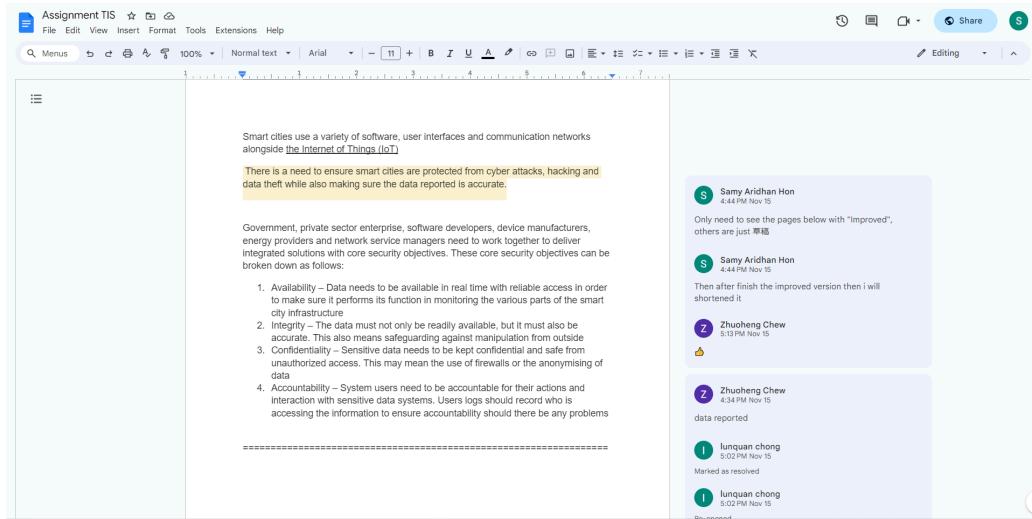
[November 5, 2023]

Empathy - Kick-starting the project and brainstorming ideas based on topics given



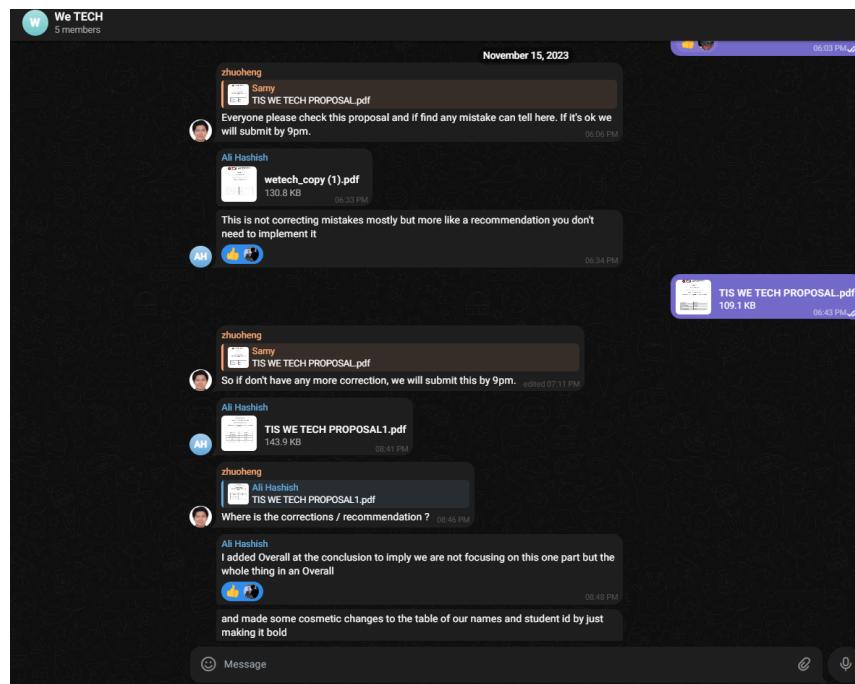
[November 5, 2023]

Empathy - Brainstorming/Discussing idea on google docs and understanding the concept of Smart City



[November 15, 2023]

Empathy & Define & Ideate - Finalizing the rough idea and submission of proposal



[December 9, 2023]

Empathy - Creation and Distribution of Survey (Google Form) to acquire data on users experience with public bus



Section 1 of 2

Public Bus Experience

Hi everyone, thank you so much for taking the time to fill in this form.
 For this section, please share your experience and problems faced taking the public bus. You can still fill in even if you only used to take bus and not anymore now.
 I appreciate your effort to aid me in completing my project.

Age *
 Short answer text

Gender *
 Male
 Female

[December 10, 2023]

Define & Ideate - First attempt of requesting for information interview through email from an expert in Causeway Link company, Jb's biggest public bus provider (**UNSUCCESSFUL**)

Requesting for an informational online interview [Inbox](#)

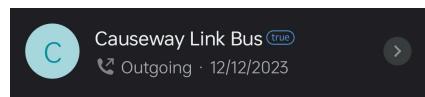
S Samy Aridhan Hon <samyaridhanon@gmail.com>
 to enquiry ▾
 Hello,
 My name is Mohamed Samy Aridhan Hon and I am a first year student pursuing degree of Software Engineering at Universiti Teknologi Malaysia. I'm currently working on a project proposal for the subject Technology and Information System which requires me to implement improvements on an existing system, and I have decided to focus on improving the public bus system in Johor Bahru. As Causeway Link is currently the biggest company to manage and provide public buses in Johor Bahru through myBAS, I am reaching out to you to request for an online informational interview using the platform Google Meet with one of the company workers.
 My goal is to acquire knowledge from a worker who is experienced in the public transport industry and has a deep insight on the current public bus system. It would be great if I can receive opinions from an expert that could provide critiques and point out the flaws of my proposal so I could further improve and make it more realistic and in touch with the current system.
 I have quite a few questions to ask but it would only take around 15-30 minutes. Please tell me the available times to conduct the interview and if it's possible, I would like the interview to be conducted before 15 December, Friday.
 I would really appreciate it if you could consider and accept my request as it will aid me greatly to complete my project. I will provide my information below, feel free to contact me anytime to inquire further details. Thank you so much and I am looking forward to the interview.

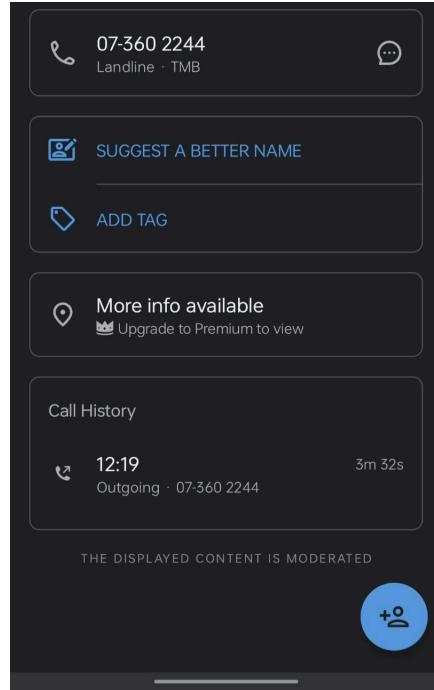
Name : Mohamad Samy Aridhan Hon Bin M.Amin Hon
 E-mail : samyaridhanon@gmail.com
 Phone Number : 018-299 9589

Sincerely,
 Samy

[December 12, 2023]

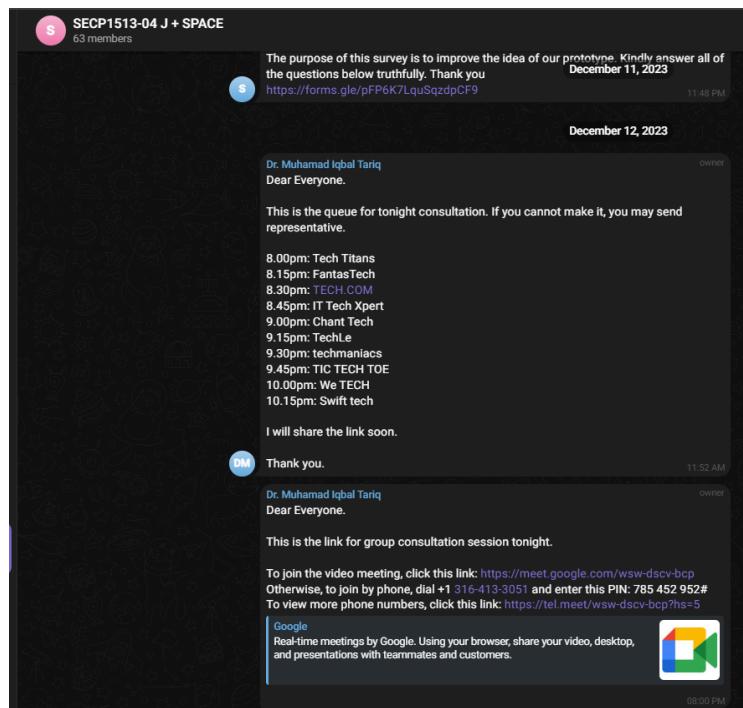
Define & Ideate - Second attempt of requesting for information interview through call from an expert in Causeway Link company (Successfully acquiring a phone number of Business Manager of the company)





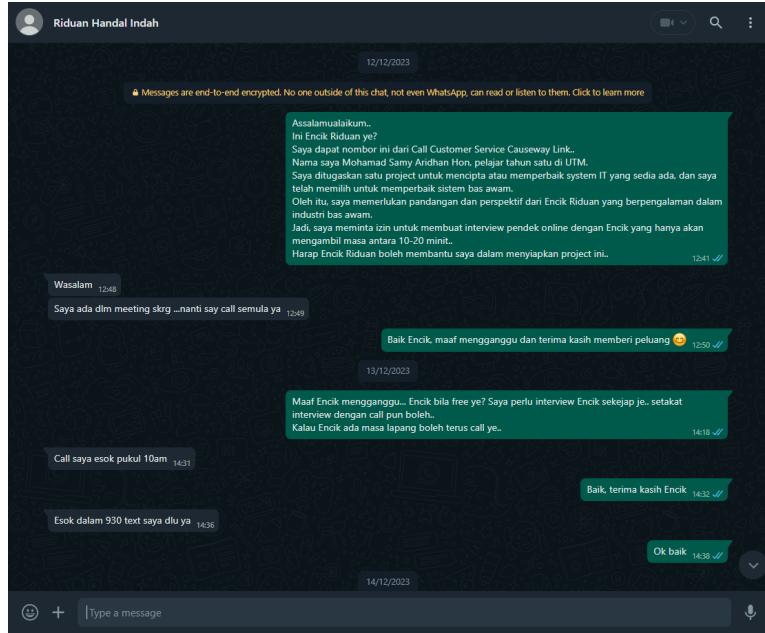
[December 12, 2023]

Define & Ideate - Feedback and recommendations of proposal from Dr. Iqbal before proceeding to next phase of the project



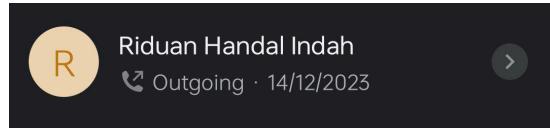
[December 12&13, 2023]

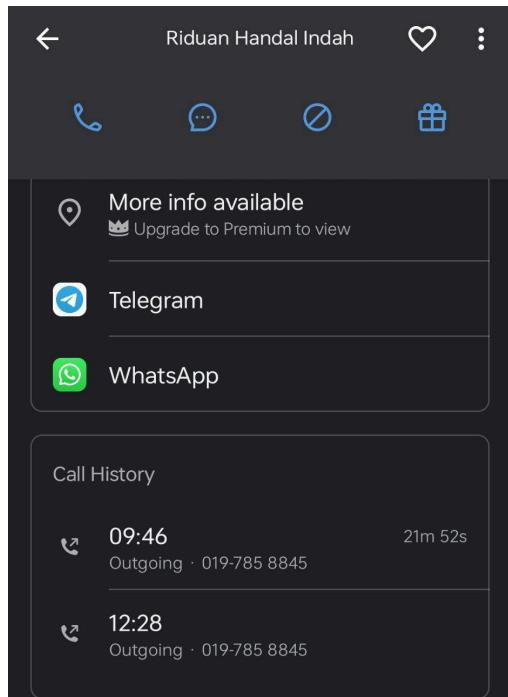
Define & Ideate - Scheduling for informational interview with Business Manager of Causeway Link



[December 14, 2023]

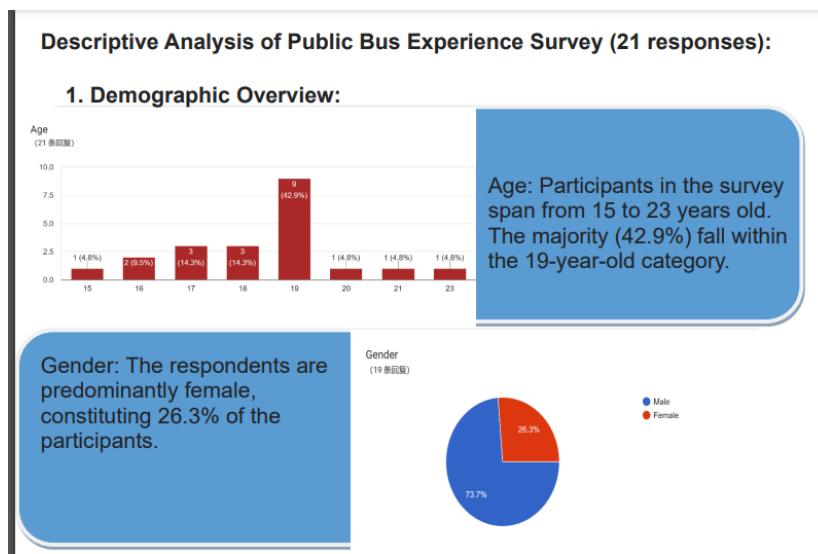
Define & Ideate - Informational interview with Business Manager of Causeway Link





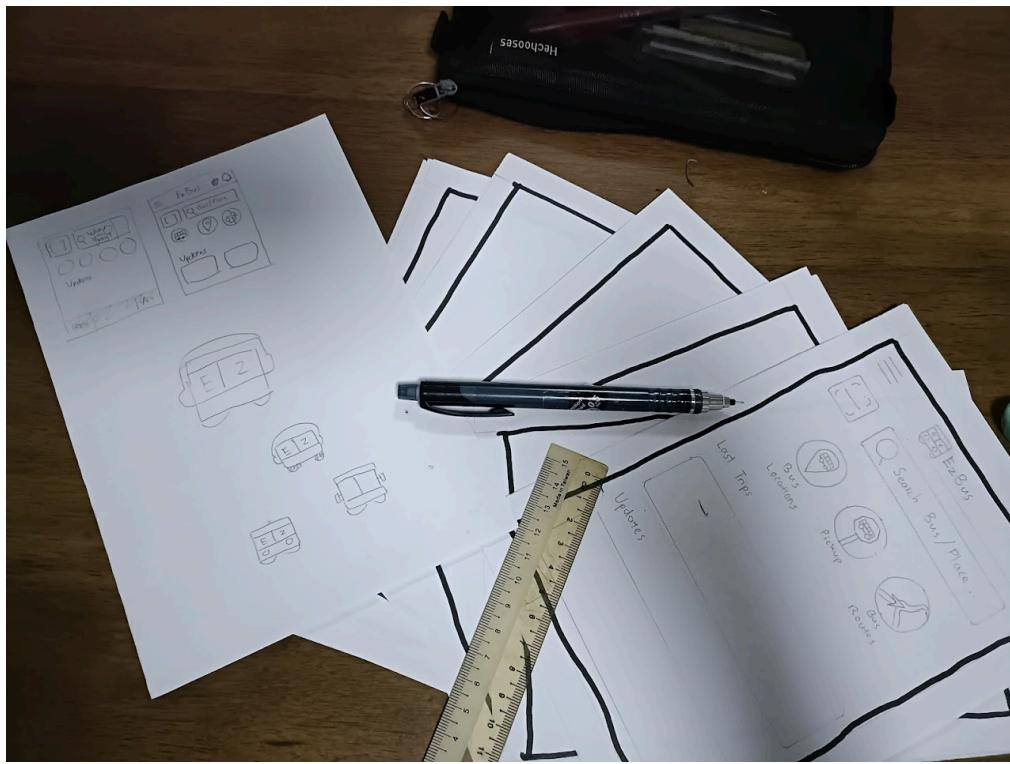
[December 14, 2023]

Empathy - Completion and submission of survey's descriptive analysis



[January 01,2024]

Prototype - Brainstorming for the design and the rough idea of prototype



[January 04, 2024]

Prototype & Testing - Final meeting to finalize the prototype and testing the effectiveness of prototype and discussion about presentation



Empathy

Observation

It is noticeable that the majority of citizens in Johor Bahru do not prefer public buses as a transport as there are negative stigmas around it. The stigma includes but not limited to the bus not being punctual, the inconsistent departure of the bus and having to wait more than an hour just to take a bus.

Engage

1. Surveys

Majority of the respondents have expressed their dissatisfaction and bad experience with the efficiency of the public bus system. The main source of their frustration is due to the time wasted when taking the public bus.

2. Interview with Expert

The expert has expressed that there are still many rooms of improvement to fully utilize public buses. They understand the frustration and will take our suggestions to consideration to improve the public bus system.

Immerse

From personal experience, it is proven that the dissatisfaction and frustration faced by the respondents are indeed true and understandable. In our opinion, the system improvement should be done as soon as possible to improve user experience as the inefficiency causes stress for those who have the need to frequently take the bus.

(180 words)

Define

The experience of taking a bus is too unpredictable due to many reasons, such as traffic and driver's behavior. Firstly, passengers always need to wait at bus stops for an indefinite amount of time as they have no means to know where the bus is currently at and whether the bus does not depart on time, stuck in traffic or even not departing at all.

Secondly, the trouble of stopping the bus is a common issue. There are times where the driver skips the bus stop for no particular reason. Also, it becomes a problem to stop a bus for bus stops located on highways as the bus moves at high speed and it is hard to identify.

Thirdly, the pricing of the bus fares is awfully inconsistent and dependent on the driver. It is not unusual for the driver to charge more than the designated price.

Lastly, the bus numbers, bus routes and departing time are not frequently updated online and it is difficult to retrieve information regarding them and understand which bus to board if you are new in Johor Bahru.

(183 words)

Ideate

First problem can be overcome by implementing a live location tracker on each bus that can be monitored publicly. With this, the waiting time for the bus will be greatly reduced as with this feature, the passengers can anticipate when the bus is going to arrive.

Second problem can be improved by creating a system for the users to be able to book pickup points at bus stops so that the bus would be informed early to stop only at required bus stops and pick up the passengers that want to board the bus.

The inconsistency of ticket prices and inconvenience of carrying money changes can be solved by integrating the automated payment system by checking-in when boarding on the bus and checking-out when getting off the bus.

To deal with the problems of difficulty in gaining information about the bus routes and being informed about any changes or updates, We Tech will develop an app that features all the previously suggested systems, including the provision of the routes of all the buses in detail which is consistently monitored and updated.

To reduce the scope of error and inaccuracy even more, we implement a feedback and report system for the users to use so that they can report any problems such as system or features failure or inaccuracy in the provided information.

(222 words)

Prototype

To accommodate the functions we proposed as solutions, we have come up with an app with a user-friendly interface. Users are required to register an account and link their E-wallet or Bank Account to make payment with the app. The main functions of the app would be booking a pickup point, checking updates on your bookmarked bus, checking bus locations and arrival time, checking bus routes and making cashless payments.

The interface we are aiming for is to be as simple, minimal and straightforward as possible so that it can be understood and used by people of any age regardless of their familiarity with smartphone technology.

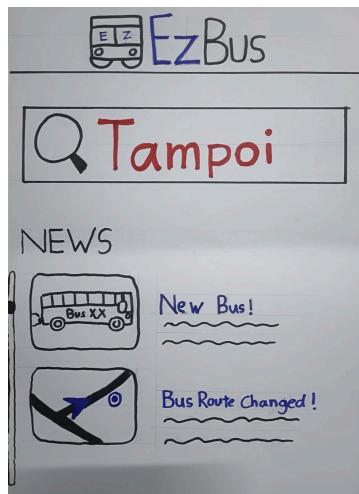
To further understand what it takes to develop a good app interface, we have referred to the design of several utility apps such as Grab and Foodpanda, which have similar interface design. We have also experienced the operation of the current public bus app which is LUGO. Although all the functions are usable and working well, the app is slightly confusing to use for the people who are not familiar with it.

(178 words)

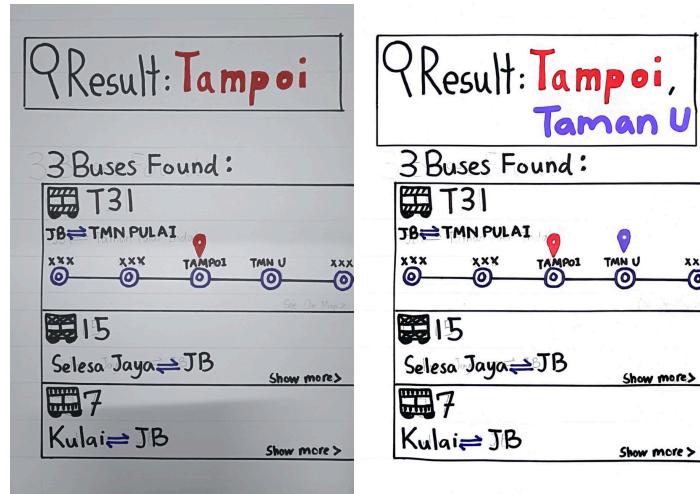
Test



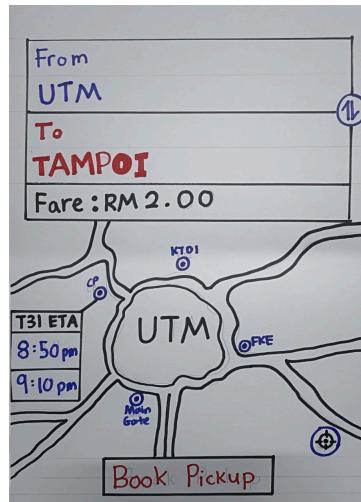
1. From the homescreen, users locate our app EZBus and click to open.



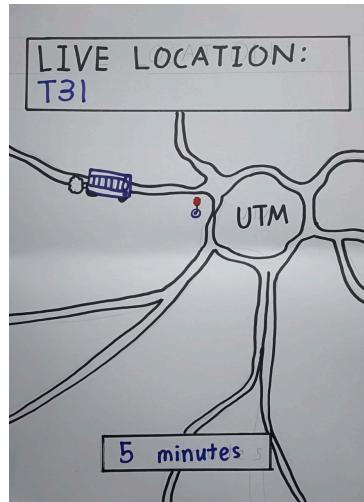
2. From the home page, users can see the news of any buses and be informed if relevant. To take a bus, users first search the place they want to go on the search bar.



3. Users can search multiple places if necessary. Then users need to choose any buses shown from the result.



4. Users choose a bus stop nearby to book the pickup point. The bus fare and the ETA of the chosen bus are also shown to users.



5. After booking, users are shown the live location of the bus and the wait time. When users board on the bus, the screen will show the estimated arrival time instead.



6. After successfully reaching the destination, users can rate their experience and submit feedback to improve the system.

(141 words)

Reflection

Chew Zhuo Heng



My goal of learning this subject is to acquire a thorough understanding of technology and information systems, to understand how it can apply in real-life. Now I have foundational knowledge about this subject, it makes me understand basic components of information systems viz computer hardware, software and network. Design thinking really impacts me a lot, it encourages me to think more creatively, innovatively and maturely. Design thinking allows me to create and provide some solutions for problems we meet. When I provide any solution, my teammates will always communicate with me about the pros and cons of my solution. I plan to enhance my skills in programming, system analysis and database management by continuous learning to improve my potential in the industry.

Chong Lun Quan



In my pursuit of a degree in Technology and Information Systems, my overarching goal is to not only comprehend the subject thoroughly but also to develop practical skills that will position me as an industry standout. The incorporation of design thinking into my academic journey aligns seamlessly with my aspiration to contribute innovatively to the field.

This strategic approach not only fortifies my objective but also fosters a mindset centered on empathy, ideation, and iteration. By emphasizing these principles, I am better equipped to address complex problems, engage in critical thinking, and seamlessly adapt to the dynamic nature of the industry landscape. This holistic perspective is pivotal in preparing me for the challenges that lie ahead.

To further bolster my potential within the industry, I am committed to active involvement in collaborative projects, seeking mentorship, and a steadfast dedication to refining my design thinking skills. I firmly believe that continuous learning and staying abreast of industry trends are indispensable components of my overarching strategy for sustained, long-term success in the dynamic realm of technology and information systems.

Mohamad Samy Aridhan Hon

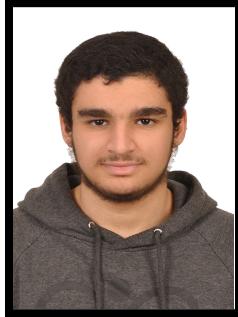


My objective in this course is to get as much exposure as possible to the working field. Unlike other courses that only teach theoretical knowledge, TIS encourages us to gain more practical knowledge by giving us opportunities to communicate with experts in the working field.

Doing this project has helped gain a lot of insights on the basic idea of developing a system by ourselves. This experience will help me build a stronger foundation when it comes to creating an app or website.

To maximize my potential, I have to be more proactive in participating in projects outside my curriculum. Experience is the most valuable thing I can get while still in college and it will help me get to where I want to.

Ali Eslam Essameldin Hashish



I'm aiming to become widely knowledgeable about the basics of design thinking and its benefits in my life as a programmer. Also being knowledgeable about technology and information will help a lot in my daily life activities.

Design Thinking has greatly changed my view about the technological world we live in today and how it deals with and redefines problems to simplify and understand it, mostly useful for tackling ill-defined or unknown problems we may encounter today.

I plan to improve myself over the course months and years to able to reach my goals as a software engineer. I would start and love to start by only focusing on Programming and their supersets to evolve my skills.

Alwaeli AMR Khaled Abdo



My goal is to gain a better understanding of the fundamental concepts of technology and information systems. I hope that I can develop my programming skills and database management, which will make me able to pursue a good career in the technology industry.

Design thinking teaches us empathy, creativity, and innovation, and helps me to develop a better perspective on the challenges faced by the technology industry. I can identify the causes of the problems and develop good solutions that can meet the needs of the end-users.

To improve my potential in the industry, I am planning to continue learning and developing my overall skills in programming and database management. (650 words)

Task Distribution

Tasks	Chew Zhuo Heng	Chong Lun Quan	Mohamad Samy Aridhan Hon	Ali Eslam Essameldin Hashish	Alwaeli AMR Khaled Abdo
Preparing a survey via Google form	/		/		
Distribution of Google Form		/		/	/
Preparing Survey's Descriptive Analysis Report		/			
Interview Questions preparation	/			/	
Looking for potential expert for interview		/	/		/
Requesting permission and scheduling of interview		/	/		
Conducting the interview			/		
Prototype Designing and Preparation	/			/	/

Drawing and Designing Final Prototype	/	/	/	/	
Report: Project Timeline			/		
Report: Empathy	/				
Report: Define		/			
Report: Ideate			/		
Report: Prototype & Testing				/	
Report: Reflection	/	/	/	/	/
Report's Overall: Formatting, Cover page, Task Distribution, Reference	/		/		

(1554 words)

Reference

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Mark Wardman, Public transport values of time, Transport Policy, Volume 11, Issue 4, 2004, Pages 363-377, ISSN 0967-070X,
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White, P. (2017). *Public transport: Its planning, management and Operation*. Routledge.