



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SECP 1513 - Sec 07
TECHNOLOGY AND INFORMATION SYSTEM

PROJECT:

Low Fidelity Prototype Project (Part 2)

GROUP 6

LECTURER: Hairudin Bin Abdul Majid

DUE DATE: 4/2/2022

Group leaders contact number: 016-5653191

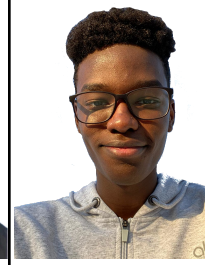
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TABLE OF CONTENT

INTRODUCTION	3
DETAIL STEPS	4
DETAILED DESCRIPTION	5
BUSINESS FLOW DIAGRAM	7
AWS ARCHITECTURE DESIGN	10
Interpretation AWS Architecture Design	11
OUR LOW FIDELITY MOCKUPS	12
RESTAURANT OWNER VIEW	12
NORMAL CUSTOMER VIEW	14
REFLECTION	19
REFERENCE	25

INTRODUCTION

In this project we chose the idea of a restaurant reservation system, a restaurant reservation is a reservation made ahead of time to ensure that a table is available at a restaurant, so we came up with a unique idea for implementing the reservation system in an app called Resto instead of using the traditional way of making a reservation. The restaurant reservation system is mainly targeted towards two clients, which are the customers and the restaurant owners. Customers can sign in the app and reserve a restaurant using the application while restaurant owners can set up and advertise their restaurant page by signing in and partnering with us. What makes our app special is that we implemented several 4th IR technologies such as:

- Big data analytics for gathering all the valuable feedback from our customers.
- Internet of things(IoT) for the use of the smart occupancy sensors, these sensors track and measure the flow of the people in the restaurant then send that data to our app to show whether a restaurant is fully reserved or partially occupied.
- Virtual reality for the customers to get a better feel of the environment of the restaurant.
- Augmented reality for the customers to see the actual measurements of the food dish on your table.
- AI/Machine learning for the restaurant recommendation and ranking system which will rank restaurants based on the feedback of the customers.

DETAIL STEPS

We, members of group 6 from SECP1513-07 worked together to finish our low fidelity prototype project whether for part 1 or part 2. From the span of October 2021 until January 2022, we actively discuss the projects in our WhatsApp group. Not only that, we also held several online meetings through Discord.



We held about 4 meetings to complete our project 2. For the first online discussion, we held a meeting on 16 December 2021. During this meeting, we discussed the title of our project. We then agreed on the idea of a restaurant reservation application that uses several implementations of 4th IR such as virtual reality, augmented reality, and others.

Next, we held our second meeting on 13 January 2022. This meeting was supposed to be for our Assignment 4. But we were able to discuss a bit more about project 2 in this meeting. The meeting was done at night, so only four of us were present. We discussed the flow diagram of our project. We were able to identify some important modules such as home page, search and restaurant page. Some of the task division also was done during this discussion.

Our third discussion was on 23 January 2022. We discussed AWS Architecture planning and how to do our presentation. We used Canva to create our presentation, because it is really useful for collaboration. We also reached a conclusion, to use Figma for our low fidelity prototype of our application. This is because Figma is widely used, popular and user friendly. After that, we continued to finish our project, mock up and presentation.

Our last meeting was on 26 January 2022, we did a test run for our presentation. We hope that we are able to present clearly during the presentation day. Chun Ming volunteered to present our presentation slide. We discussed the flow of our presentation overall, our meeting went very smoothly and we just need to present properly and submit our project. Lastly, we all finished everything before the deadline and submitted it on 4/2/2022.

DETAILED DESCRIPTION

First of all, we discussed the observed problems that public users are currently facing in order to make a reservation at restaurants. Before we created this project, restaurants that have not used the 4th Industrial Revolution (IR 4.0) technology implementation might lead to some issues. For example, we found that restaurant traditional reservation methods, especially phone calling to the restaurant, might be tedious and waste a lot of time and energy for restaurant owners and public users to make reservations. Through phone calls, the possibility to make mistakes on detailed information provided, such as name, contact number, etc. by customers is higher compared to using IR 4.0 technology. By using this application RESTO, customers' personal information can be provided for the restaurant including customers' name, contact numbers and other information required.

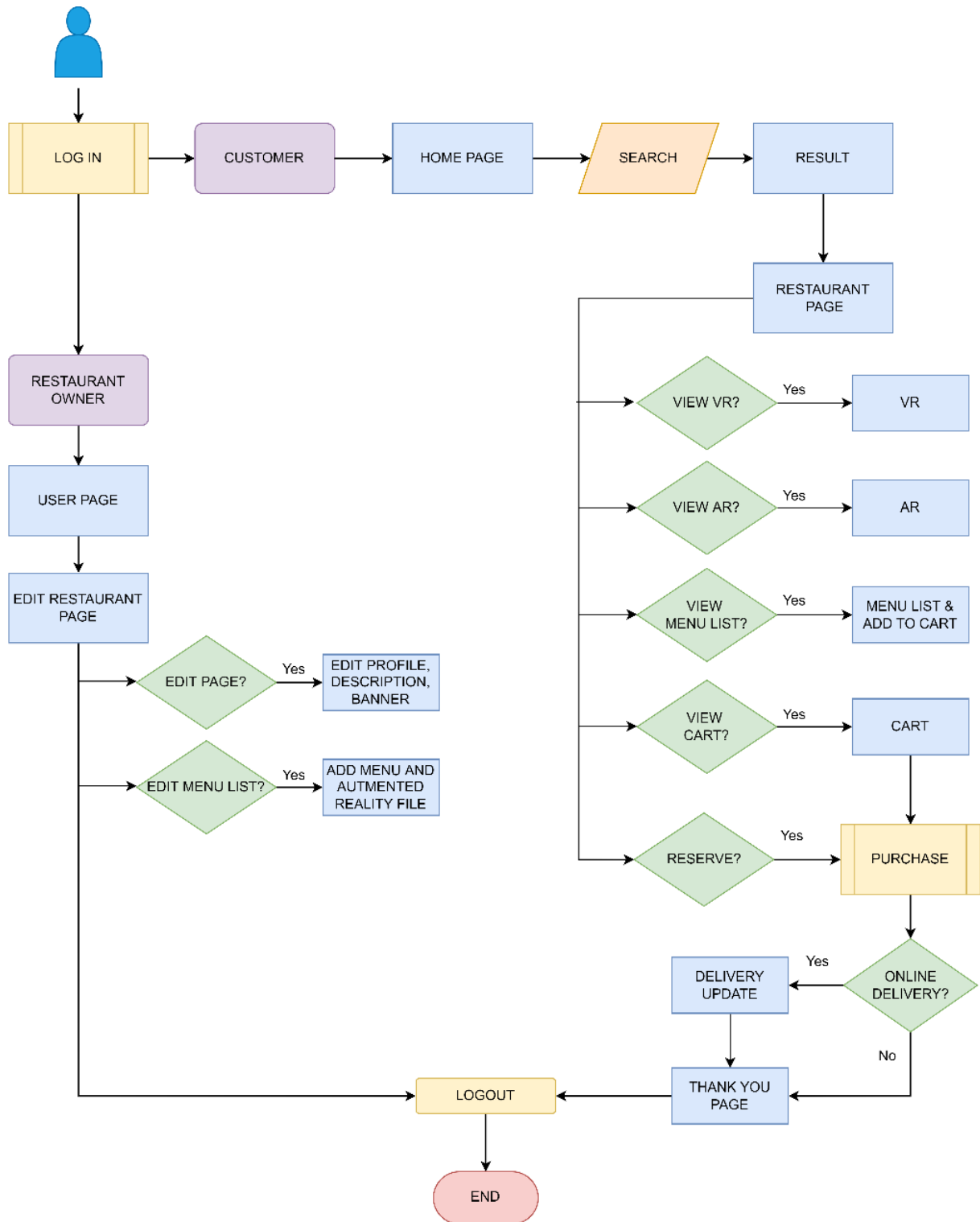
Without the proper reservation system, double reservation is the critical mistake that will be faced. For instance, if two customers make the same reservation to two different staff in a restaurant, with the pen-and-paper reservation record, the staff might make mistakes such as a wrong record and miss out the reservation record, which might lead to double reservation. So, we came up with a solution where our application can record when customers reserve a table of a particular restaurant at a particular time to avoid double reservation.

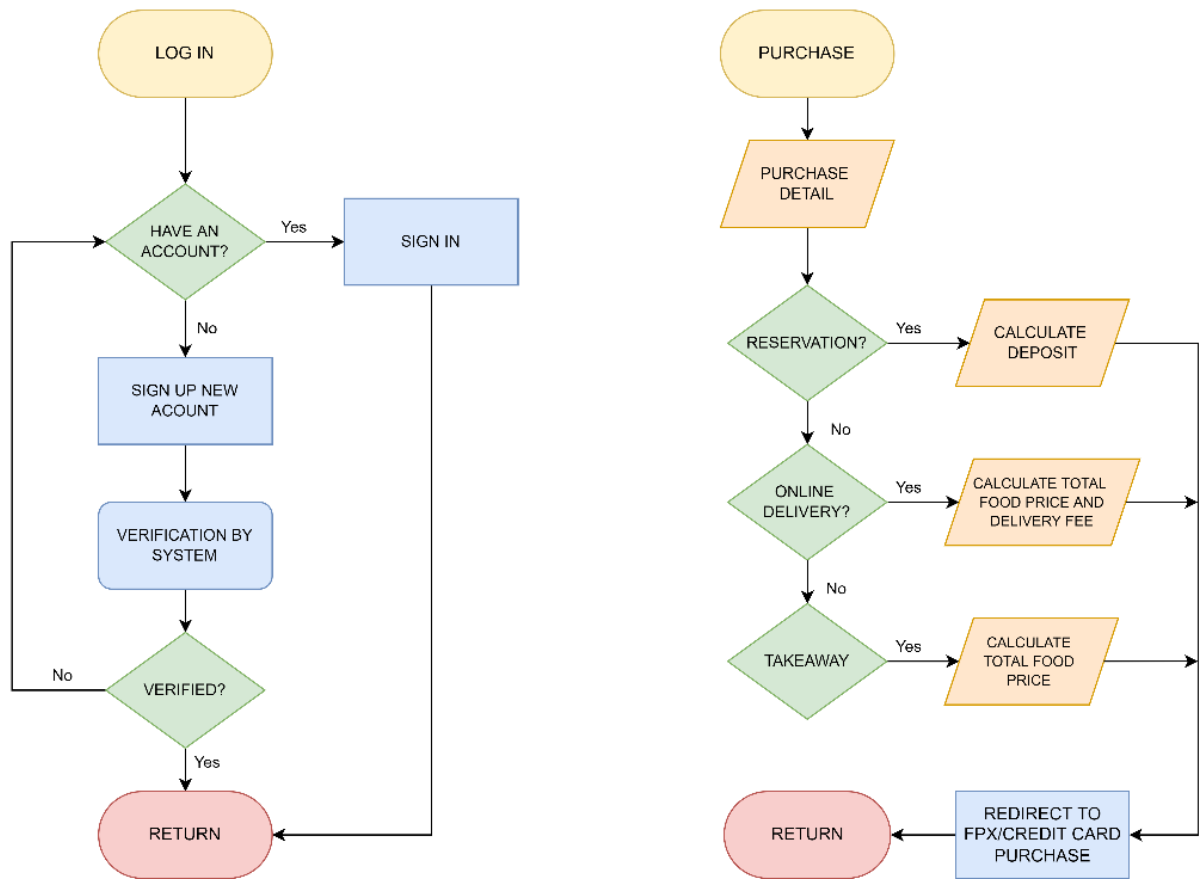
On the other hand, restaurant owners will need proper management to ensure the reservations are made accordingly to avoid the time clashing between the customer and the next reserved customer for the same table. If customer A has reserved a table at a restaurant and he/she does not leave at the reserved time, clashing might happen to the next user who has reserved the same restaurant if the restaurant is full house. Considering this situation, we will add on half an hour before the next reservation to ensure that restaurants have enough time to clean up and prepare servings for the next reserved customer. We will also mention in terms and conditions that restaurant owners need to prepare at least two tables for reservation and one of the tables should be cleaned up half an hour before the next reservation to ensure that we can avoid the time clashing between the customer and the next reserved customer when they sign up as restaurant owner in RESTO. We will also have the right to fine the restaurant if we received more than 10 complaints about the reservation of the restaurant.

In addition, food wasting is one of the global issues. Customers will only know how the dishes look through a couple of pictures that are provided by the restaurant in their own existing applications. However, without the IR 4.0 technology, customers might not be able to estimate the portion of the servings and they might have not enough food or waste the ordered food as they cannot finish their dishes. In this case, we implemented augmented reality (AR) where customers can preview the size or the portion of the servings so that they can mention or remark for the restaurant to adjust the portion of the servings so that we can avoid food wasting.

In order to make this project, our team showed the team working to develop our low fidelity prototype. We held several meetings and discussions from November 2021 until January 2022 through WhatsApp and Discord. We also agreed and concluded that our restaurant reservation application will be called RESTO. We also discussed several things of this application including its main functionalities, components and how the application would look. Considering the industrial revolution nowadays, we also decided to implement the technology of 4th Industrial Revolution (IR 4.0) so all the features in our application will come in handy and it is accessible for everyone including the restaurant owners and the public users.

BUSINESS FLOW DIAGRAM





In this system, we have two main clients which are normal customers who want to reserve a restaurant or takeaway or online delivery food. Next, the restaurant owner. Users can log in as normal customers or restaurant owners, and their information will be verified by our system.

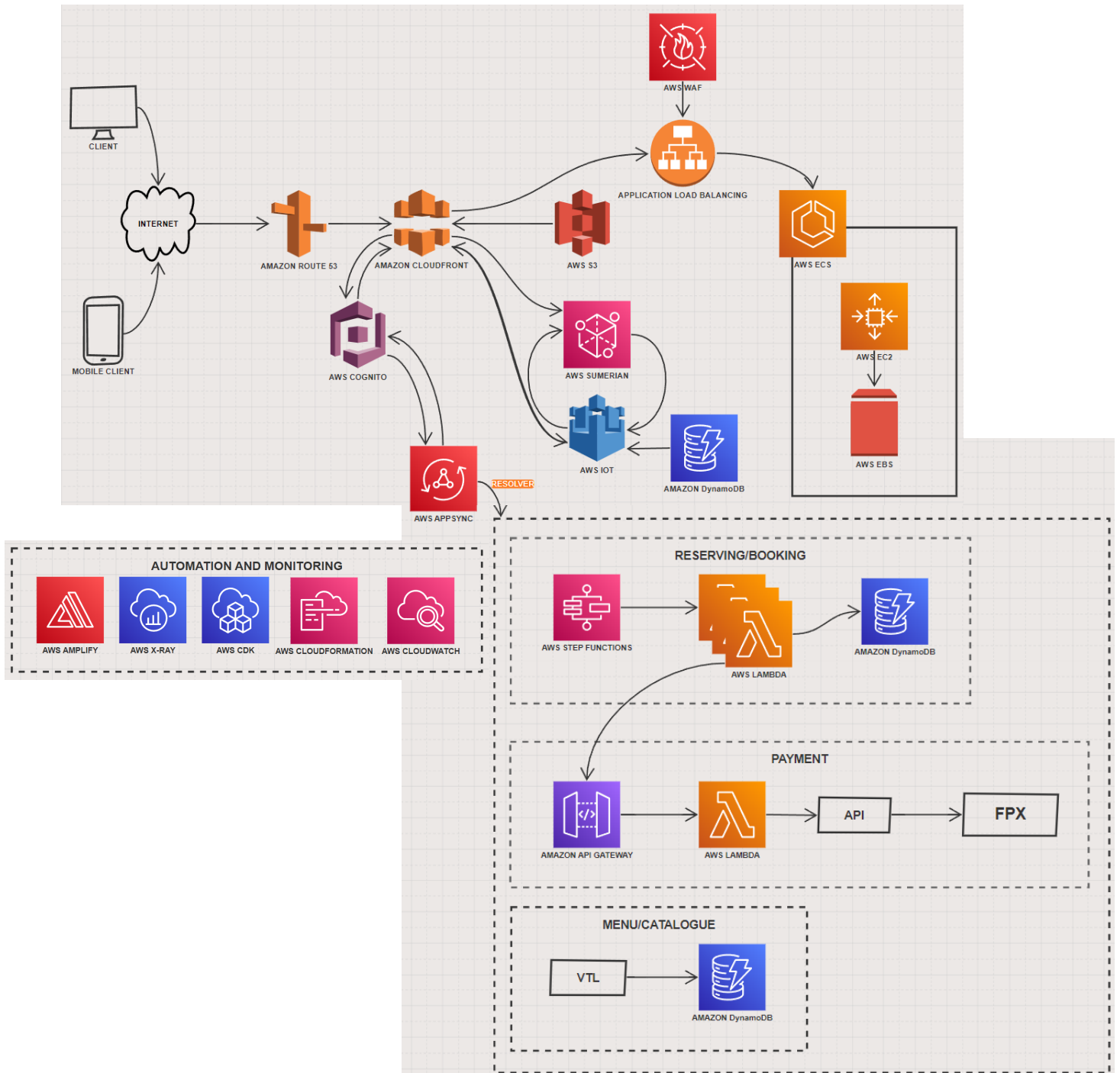
For restaurant owners, users will be given one restaurant page for them to add and edit anything about their restaurant, to advertise their business. For example, they can edit their restaurant's profile picture, profile banner, locations, description or even menu lists. This will allow the restaurant owner to have a complete control over their page.

Next, for normal customers. They can search any restaurant that they want, and apply any filter according to their preference. Our system will fully automate the process and produce the best recommendations through the implementation of AI and machine learning algorithms. From the search result, they can go to the restaurant page that they like.

Users can make a choice to see the menu lists, Augmented Reality view of food, Virtual Reality view of restaurant, make a restaurant reservation and view cart for online food delivery or takeaway. Our system will calculate everything from them, and apply discounts depending on the terms and conditions. Our system will also check for restaurant availability using Internet of Things implementation if they want to reserve the restaurant.

Users have the flexibility to use either cash, fpx transfer or credit card for their purchase. After that, our application will provide live updates on the delivered food if they choose online delivery. Lastly a receipt will be automatically generated for future reference, and they can logout if they want, or continue using the application.

AWS ARCHITECTURE DESIGN



Interpretation AWS Architecture Design

We may deduce from the diagram that the client will connect to the internet. Then it will connect to AWS Route 53 through the internet, providing developers and companies with a highly dependable and cost-effective method of routing end users to Internet applications by translating names. We also have AWS Sumerian in our system, which makes it easier and faster to design and execute virtual reality (VR), augmented reality (AR), and 3D applications without the need for professional programming or 3D graphics knowledge.

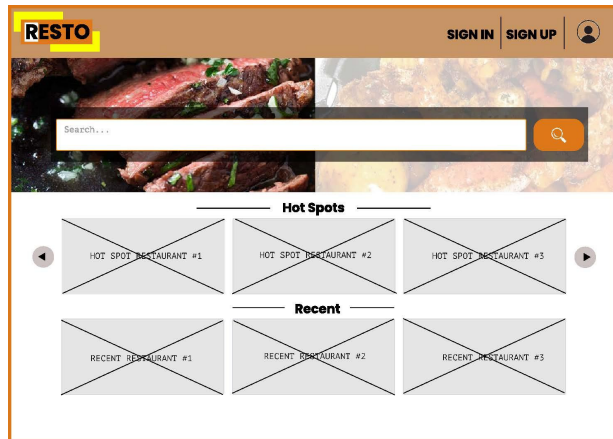
We utilize automated monitoring tools such as AWS Cloudwatch and AWS Cloudformation to keep an eye on Amazon EC2 and report back to us when something goes wrong. On your EC2 instances and on-premises servers, it may collect logs and system-level analytics from both hosts and clients.

Next, we provide AWS Lambda in reserve and booking, which allows you to run code without having to provision or manage servers and on a high-availability compute infrastructure. For AWS services like AWS S3 and AWS DynamoDB, Lambda may create data-processing triggers. This allows our code to run automatically and AWS Lambda will manage the computational resources for us.

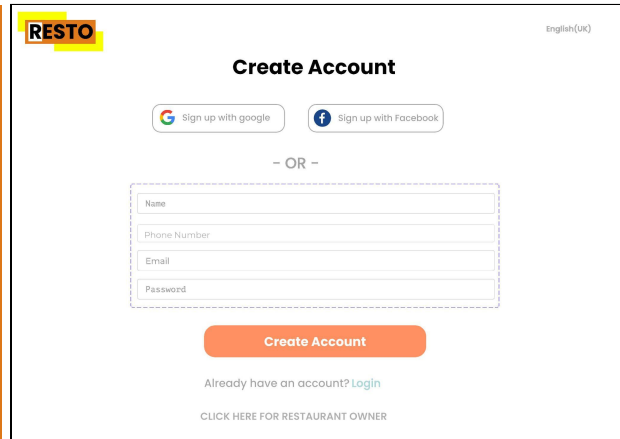
Finally, the payment module's API is a management tool that sits between a client and a set of backend services, connecting them to FPX, a secure internet-based payment gateway.

OUR LOW FIDELITY MOCKUPS

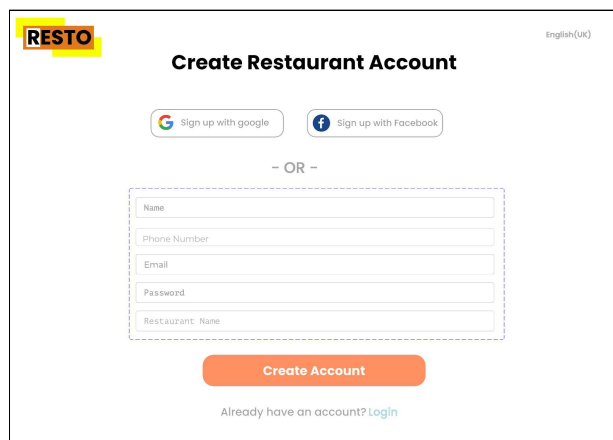
RESTAURANT OWNER VIEW



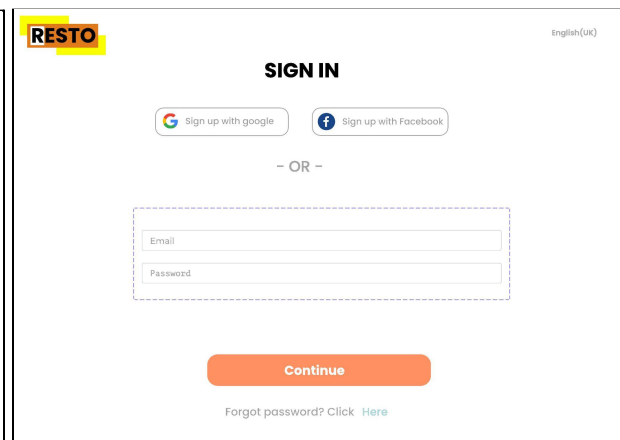
Home page



User can sign up here



User can sign up as restaurant owner



User also can sign in if already signed up

RESTO



RESTAURANT'S NAME

RESTAURANT NAME:

EDIT

CONTACT NUMBER:

EDIT

ADDRESS:

EDIT

CUISINE TYPE:

EDIT

EMAIL:

EDIT

PASSWORD:

EDIT

TAKAWAY?

YES

NO

RESERVATION?

YES

NO

SAVE

CLICK HERE TO EDIT YOUR RESTAURANT PAGE

RESTO

+

USER PAGE

+

RESTAURANT NAME

EDIT

RESTAURANT DESCRIPTION

OUR BRANCHES 1 +

+

+

+

→

MENU LIST

REVIEW

VIEW RESTAURANT IN VR

VIEW MENU IN AR

CONTACT

Restaurateurs can edit details and restaurant page here. Such as adding profile picture, and others

RESTO

+

USER PAGE

+

RESTAURANT NAME

EDIT

MENU LIST

1

+

MENU #1 DESCRIPTION

ADD OR EDIT GLTF / GLB / USDX FILE

2

+

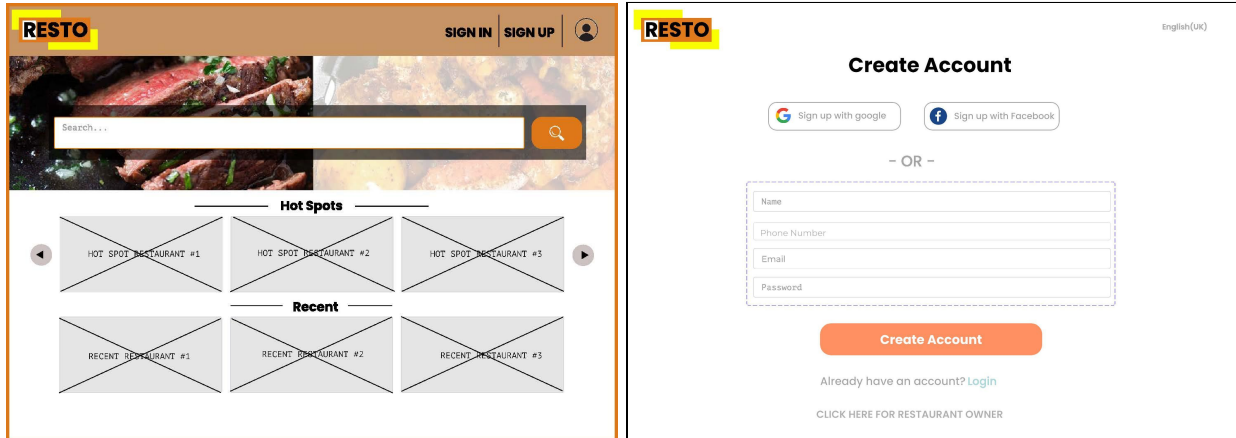
MENU #2 DESCRIPTION

ADD OR EDIT GLTF / GLB / USDX FILE

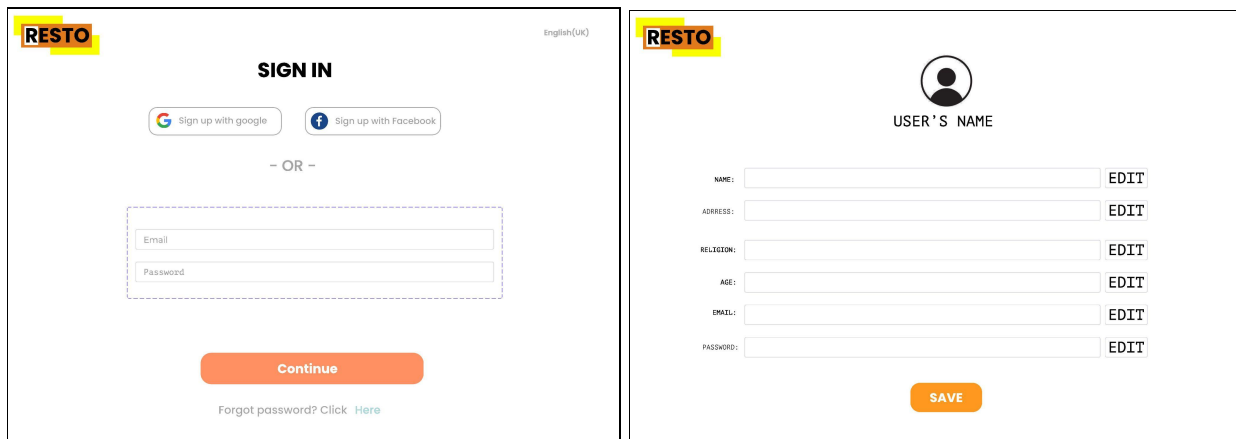
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Restaurant owners can add menu lists, augmented reality files of their foods and prices.

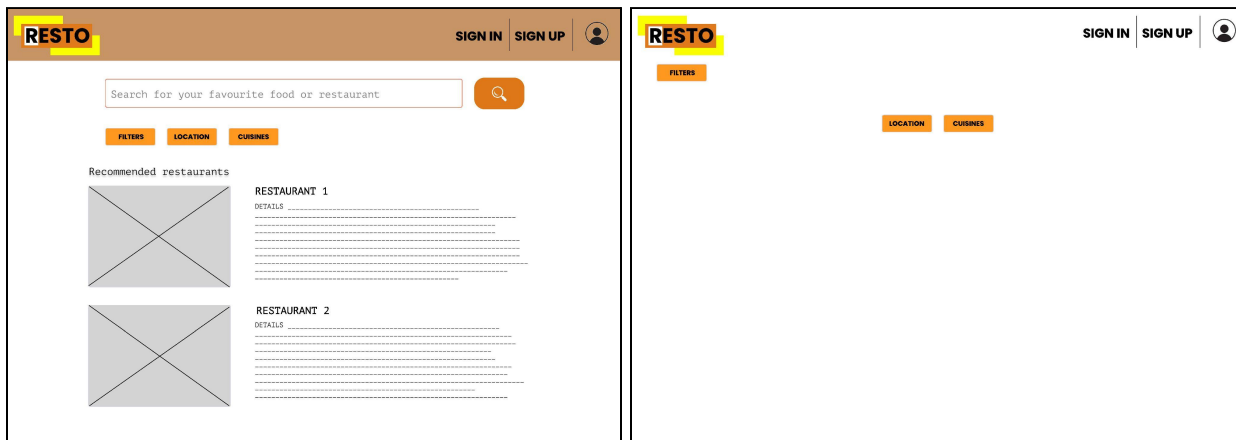
NORMAL CUSTOMER VIEW



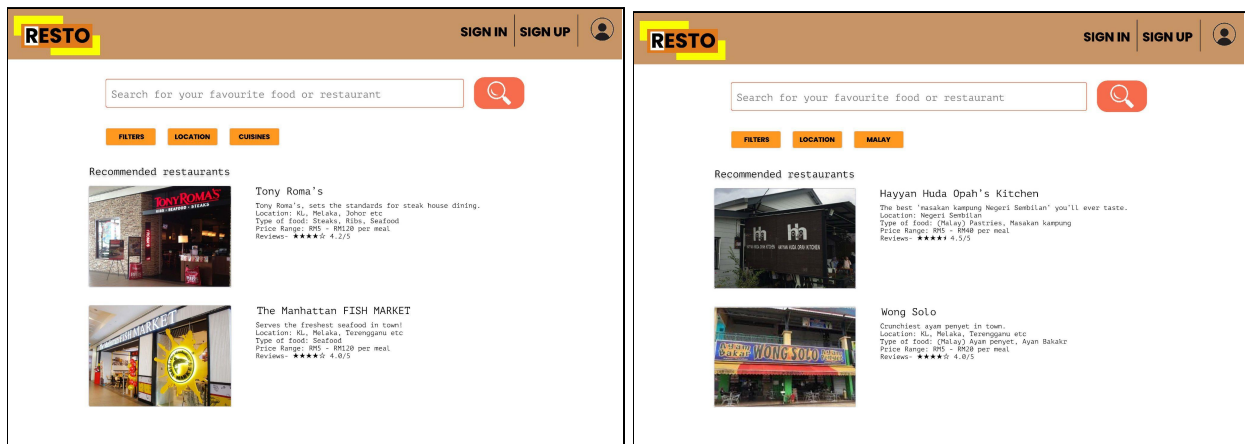
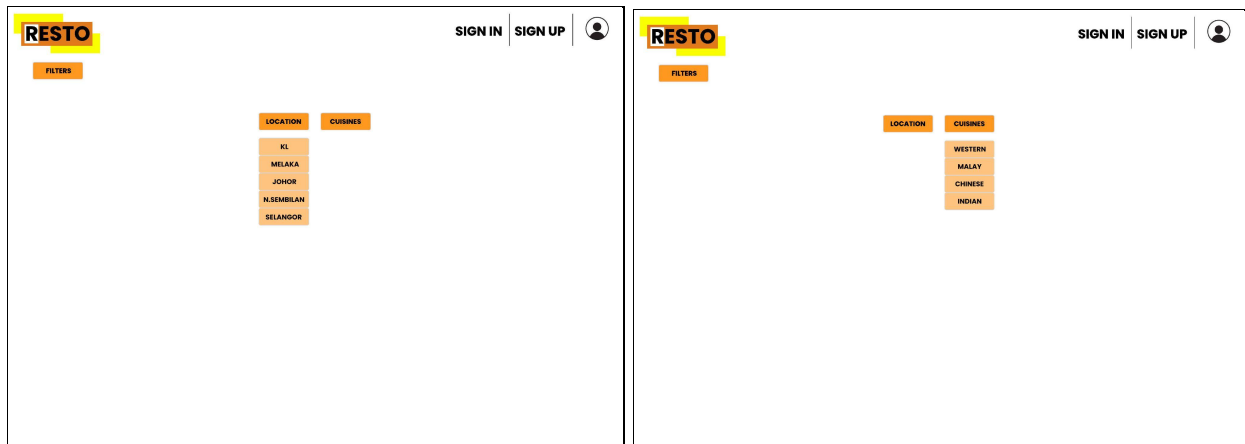
Home page is the main module, lead to restaurant, search result, signing in, and user details.



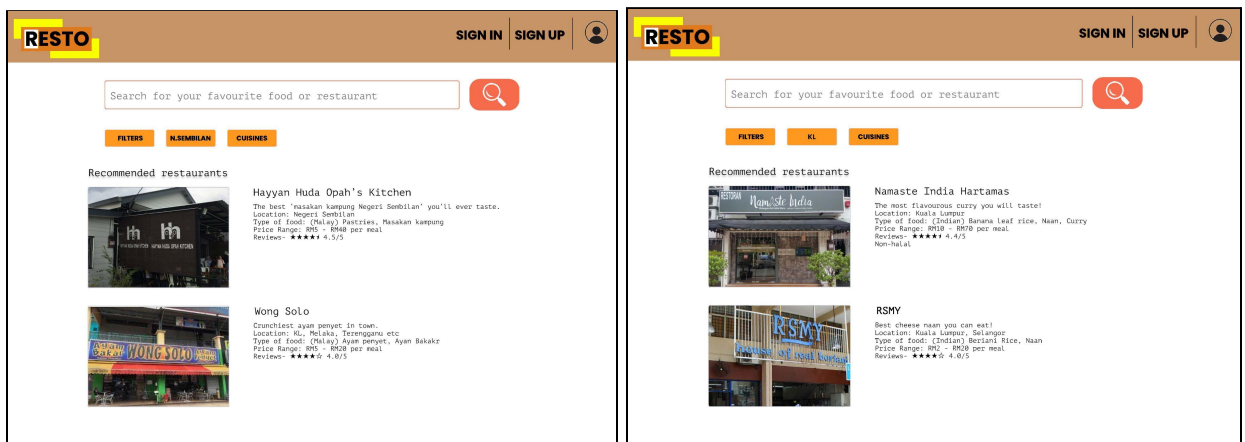
After signing in, user can change and save their detail in user page.



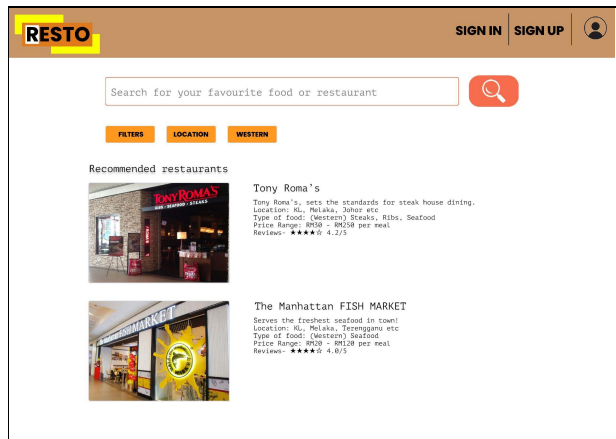
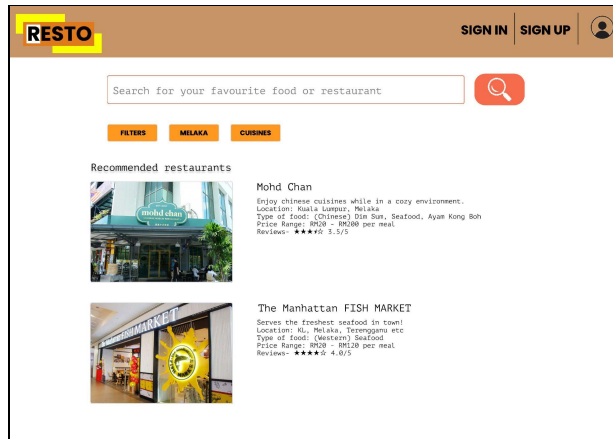
Customer also can search any restaurant they like and filter according to their preference.



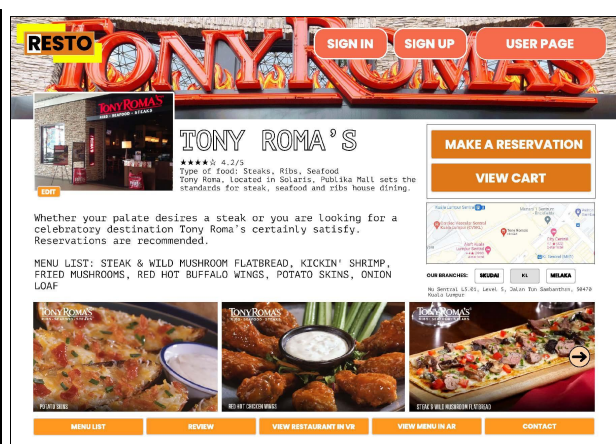
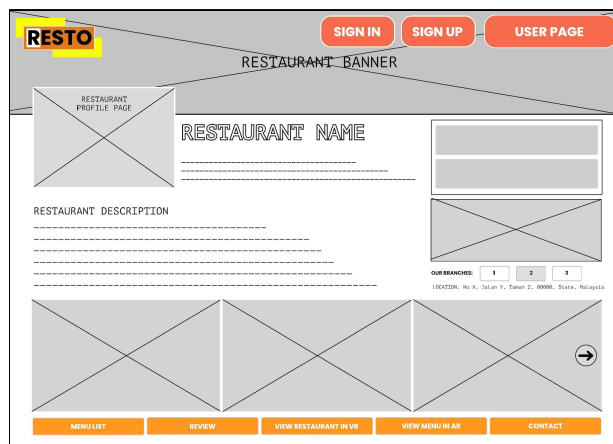
Example of search result #1 and #2



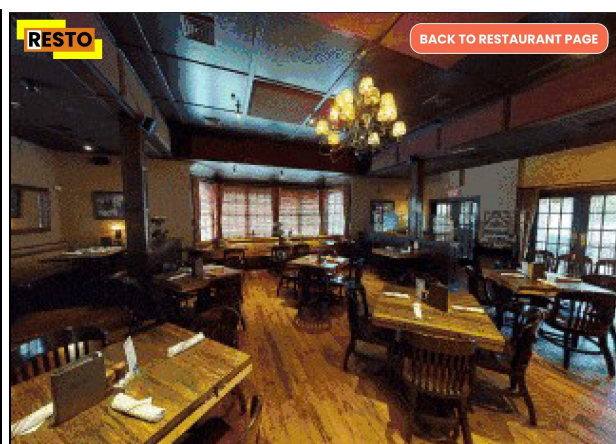
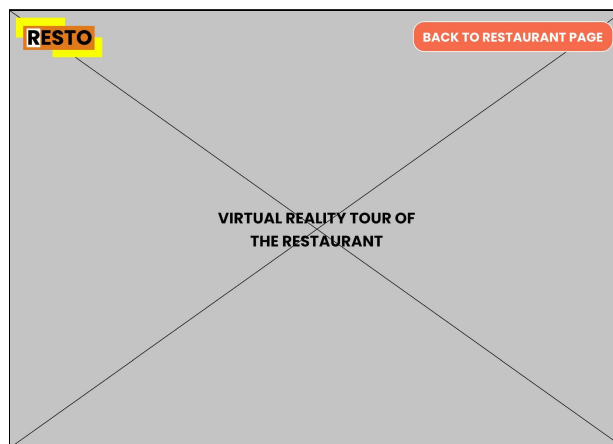
Example of search result #3 and #4



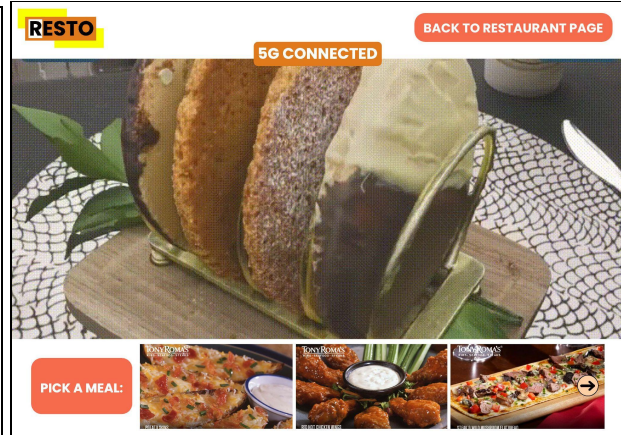
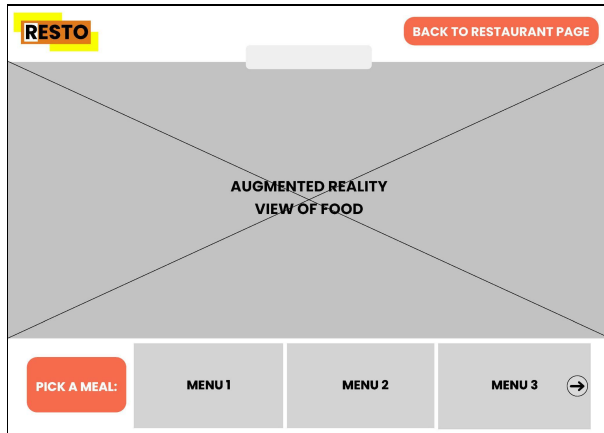
Example of search result #5 and #6



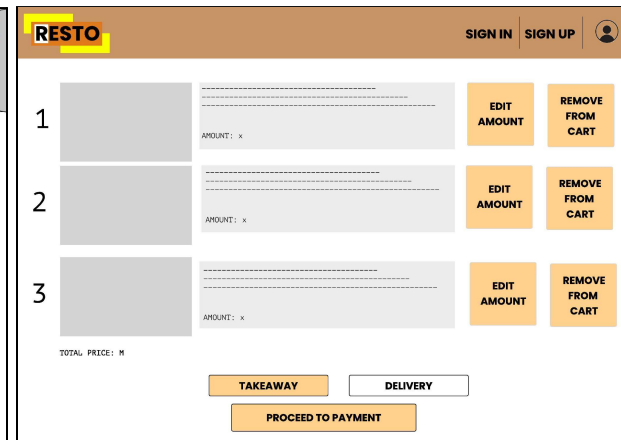
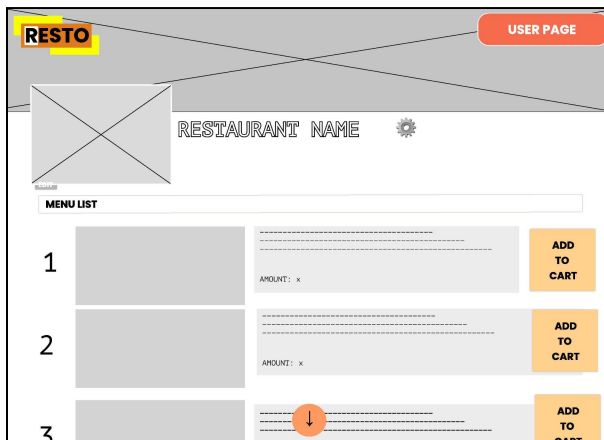
How the restaurant page will look like from customer's point of view



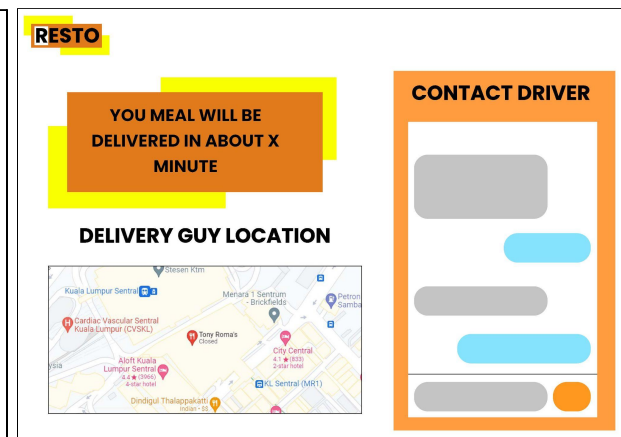
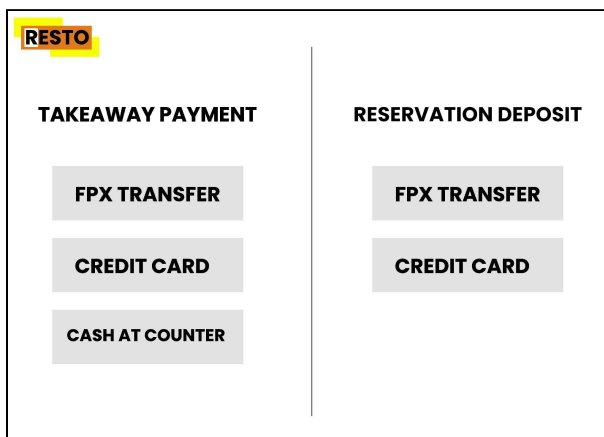
Implementation of virtual reality view of the restaurant



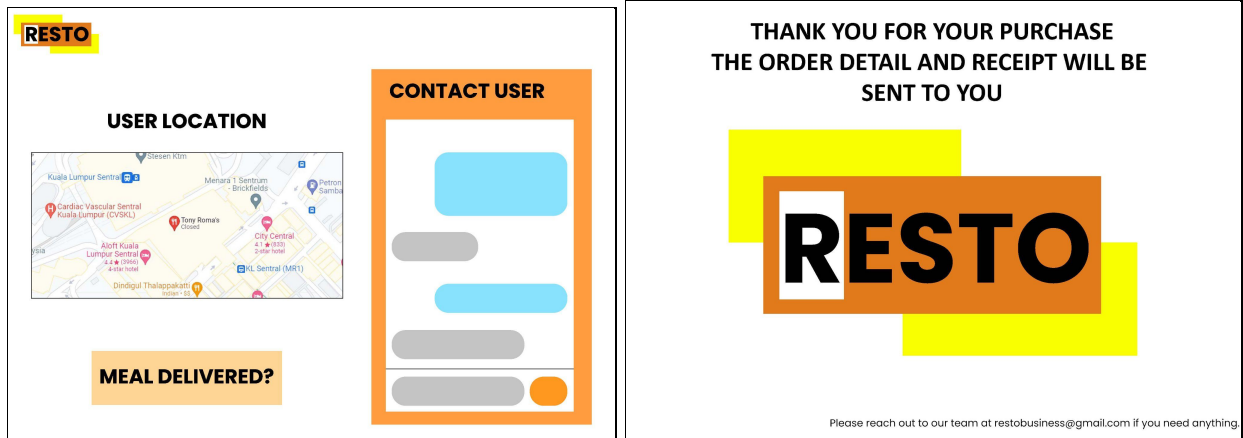
Implementation of augmented reality view of the meals



Customer can see the menu list and add to cart. Then, they can proceed with purchase



We provide different payment options. If customer order online delivery, they can see the live update of the food location.



Customer also will receive the receipt for the orders.

REFLECTION

a. What have you learned and your motivation to complete this project?

TAUFIQ	I have learnt a lot from this project especially about cloud computing, low fidelity mockups and the process of creating a business. I learnt how AWS Architecture works, and I am able to identify which AWS services will be beneficial for our project. Next, I learnt how to use Figma, a popular website for fidelity prototype creation. This project also taught me a lot about entrepreneurship. I also have improved my teamworking, creativity and critical thinking skills in order to create this project successfully. There are several motivations for me to complete this project. Firstly, the project contributes about 21% of my carry mark for the subject. I am motivated to get the best mark for this project, to get a good overall result from this subject. My next motivation is from my teammates. They helped me a lot throughout this project and since we share the same mark for this project, I don't want to disappoint them. Thus, I am motivated and want to do my best for this project, so all of us get the best mark possible for this project. Lastly, my motivation to complete this project comes from myself. I knew in order to be a good developer, website designing and cloud computing is a vital component, thus I want to gain the most out of this project.
CHUN MING	From this project, I learned the steps to develop a low fidelity prototype. I also learned to brainstorm problems from different perspectives. For our project, I was always stuck on what are the problems faced by the customers but I misunderstand that we also need to consider the problems faced by restaurant owners. My motivation to complete this project is my first experience ever in my entire life and I pay more attention to this project because I hope that my project will be successful.

NAJWAN	I know how to utilize Figma, which I learned throughout this assignment. I now have a basic understanding of how to use Figma to create and design an application or a website. In addition, when I needed to know more about the 4th Industrial Revolution, such as cloud computing, to complete my assignment successfully, my understanding of the 4th Industrial Revolution grew. Next, the most essential thing I have learned from this low-fidelity project is about Amazon Web Services and how some of their services work. Even though I don't have a thorough understanding of AWS, I do have a basic understanding of it.
AZHAN	The things that I have learned from my experiences completing the project are that I have learned a lot about low-fidelity prototypes, how to design a website, and of course about cloud computing and how to use it. To make the low-fidelity prototype, me and my team used Figma, which we had to learn first how to use it so that we can make a mock-up website. As for the cloud computing that has been mentioned, it is from AWS which we had to take part in from the SECP1513 subject. We designed an AWS architecture based on what we are trying to achieve using its services provided. The few factors that motivated me to complete the project are because it is actually quite an interesting and fun project to do, which does not make me feel burdened at all. The second factor is because it is part of my carry mark for the SECP1513 subject which I want to get high marks in. And lastly, I am motivated by my teammates as well as my lecturer which always helps, teach, and reminded me of the project which makes me want to do the project as perfect as I can.
AYMAN	Throughout this project I learned how to work and coordinate with a team to do this type of project, I learned how to use apps like figma and canva for designing our low fidelity prototype, I also learned how major factors like AWS architecture contribute to developing prototype systems. My motivation was that I was always fascinated with the idea of developing an app and working with a team to complete this project.

b. What issues and solutions are implemented to make the project a success?

TAUFIQ	There are several issues that we stumbled upon when doing this project. The first issue is when we want to do our discussion. Since everything is online, discussing the project can be a hassle. This is because our free time are not the same, different timeline and different learning schedule. Therefore, our solution for this problem is some of the discussion meetings were rescheduled for everyone to attend. The next issue is that our project is quite complicated. There are so many modules and submodules that we need to implement, in order for this project to be a success. Our solution is we put a ton of effort in order to successfully finish this project. At one point, we discussed the project until midnight (around 12.00 am). Overall, we did all of our discussions and we are able to finish everything successfully before the deadline.
CHUN MING	One of the biggest challenges of this project is about the terms and conditions for the restaurant owners. We cannot control the restaurant owners to be disciplined to our rules and regulations especially when restaurant owners do not make sure to prepare another table for the next reserved customer if the previous customer does not leave the restaurant at the reserved time. So, we came up with a solution which is that we will mention that our platform has rights to fine the restaurant owner if we get a certain amount of complaints about the restaurant's reservation. On the other hand, we also considered the global issue which is food wasting caused by customers unable to estimate the portion of servings. So, we fix this problem by using the technology of augmented reality (AR) that customers can estimate the portion of the servings before they order.
NAJWAN	A lot of issues that I need to solve with my teammates and myself. This is our first time having a low-fidelity project. So, we need to develop an application using any website that can create apps such as Figma. As this is our first time, we have to watch youtube on how to use and design in Figma and other features.

	Next, I had to face an internet problem issue because sometimes during our discussion, my ping always jumped and I always miss some important message from my friends. So, from that, I come up with the solution by recording our meeting and asking my friend to send the notes that we have discussed.
AZHAN	Some of the issues that are present in our project is about the restaurants' menu. This is due to the fact that some food on the menu is not as what it seems, for example the size and portion of food is different than what is shown on the menu. To tackle this issue, we made an AR page which required the customer to use a camera to project a 3D image of the food with the exact size of the food itself so that the customers would not get fooled by the menu. The other issue is about customers wanting to make a reservation on a certain restaurant but is not sure if the restaurant have the right setting for an event, for example a dinner event should have a classy environment. What we did to tackle the problem is that we made a VR page that shows the interior of a certain restaurant for the customers to see.
AYMAN	The main issue was that the traditional way of making a reservation required having the number of the restaurant and it costs money making a phone call, also when making a reservation in a new restaurant you don't really know what the environment of the restaurant looks like, that's why we came up with this unique idea to make an app for making reservations. Our app addresses all these issues and fixes them by the use of the 4th IR technologies we implemented.

c. What is your direction after completing this project?

TAUFIQ	My direction after this project is I will focus more for my next semester and final examinations. Since I already has some basic knowledge about fidelity prototyping and cloud computing, I will apply this knowledge for future projects. I also want to learn more about cloud computing and system development in the future. There are some parts in this project that I don't fully understand and I will work hard to become better in system development, cloud computing and project completion.
CHUN MING	I will be able to do other low fidelity prototypes in other fields or even related prototypes like this time so we can implement the 4th Industrial Revolution and smart systems so that our country will be more advanced.
NAJWAN	Since my knowledge of this project increased, I can more focus and use this project as a reference to make a project in the future. I will learn more about websites that we have used in this project like Figma as it is a beneficial website to create an application or website. I will implement my skill in this project in the future to make sure I am able to learn it independently.
AZHAN	What I will be trying to achieve after completing this project is to learn more about low-fidelity and high-fidelity prototypes as well as to learn more about how to design and create a website myself. I want to have this skill so that I can be a front-end or a full-stack developer in the near future.
AYMAN	Obviously our system is not flawless. That's why I'm going to sharpen my skills in developing these kinds of systems because maybe in the future I will become a developer.

d. What is the improvement necessary for you to improve your potential in the industry?

TAUFIQ	I think I will need to improve my teamworking skills by to improve my potential in the industry. Especially for industry related to creating a system, website and application, teamworking skills is really important. Next, I will also be involved more in project creation, self-learning and getting online certificates to improve my potential in the industry. By doing so, I am able to branch my potential career more, maybe in the future I can become a cloud computing architect or a DevOps developer or a software application specialist and many more career paths.
CHUN MING	I need to be more considerate from other perspectives, not only from one perspective like I did this time.
NAJWAN	As this project is linked to my dream of becoming a software developer, I need to improve my knowledge of technology and system. As a cloud computing architect, I have a lot of potential and I will learn a lot about entrepreneurship and AWS, so I will have a solid concept about business. Also, I will improve my teamwork skill and adaptability to make sure that I will always communicate with other people, especially with experienced people.
AZHAN	From what I can tell about my weakness is that I am not too exposed to the technology industry as I thought I was. This is because the SECP1513 subject opened my eyes about the opportunities and job scopes that are available in the industry such as Cybersecurity or even the fields of AI. This early exposure does helps me to plan my future and where I am heading. So to make this plan into a reality, I must improve my potential in the industry by taking IT courses that is littered around the internet such as from Microsoft that teaches about basics of AI which is name Microsoft Certified: Azure AI Fundamentals to enhance and add new skills that will make things easier for me in the future.
AYMAN	I want to improve my communication skills with my team members because I was the only international member of the group so it was hard for me to

	communicate sometimes when they talked in Malay, I also want to start looking more in depth in some problems because we kind of underestimated major aspects in the developing of this system like AWS.
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