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[Ms. Tan Phit Huan]

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[Kopitiam Management System Pro]

Student ID	Student Name
Ch'ng Huck Phin	0200827
Koay Ji Qian	0200022
Ooi Chee Wei	0200828
Yeoh Chern Shi	0199504

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ABSTRACT

Kopitiam Management System Pro which is a multi page web-based application which consists of multiple types of users such as. The **aim** of the project is to develop a website that is capable of managing all the kopitiams and stalls throughout Malaysia where people can review the kopitiams and stalls separately using any modern web browser supported by any kind of device anywhere & anytime. Currently in Malaysia, there is no platform that does what the team is about to build and develop which is to store data for all the kopitiams in every state. Therefore, with the issue stated above, the **solution** will be providing this web-based application that will allow anyone to have the ability to view, filter and search for the kopitiams and stalls in Malaysia. The **mission** of this project will be to come up with an idea of a solution and the first in Malaysia to ever operate this kind of service, a platform that helps to store and provide information for users regarding kopitiams throughout Malaysia. The **product** that will be delivered to the community of Malaysia will be a web-based application service that will be able to be accessed by anyone with any kind of device that supports and runs on any modern web browsers. This service has a **target market** which will be for those and anyone that would like to try out different kinds of food everywhere and for those who loves travelling interstate, and this is even suitable for tourists or visitors who visits Malaysia but have no recommendation on the whereabouts to get delicious food with information about the kopitiams.

CHAPTER 1 : INTRODUCTION

1.1 Overview

In this era of modernization, there are at least 360,000 births per day which adds up to the increment to our overall population of mankind in this world, by that the demand and supply of essential/ daily needs have been increasing as well. Therefore, there are more and more new food cafes, restaurants, coffee shops being added into the map every once in a while or as frequent as daily. Due to that, there will be lots and lots of food cafes existing in a state or country which may be known or unknown to the community. To be known by the people, there are many factors such as famous food, strategic location, convenient spot, hot spot or popular area that are frequently visited by customers and locals.

Therefore, with an overpopulated number of cafes and coffee shops with no regular customers, this will cause major impact to them as they will not be able to get profit from their daily sales if there is no customer visiting them everyday. In this competitive market, this will be a big issue for many cafe / coffee shop owners where they will face difficulty in getting their cafe/ shop to be recognised by the public.

Hence, the aim of our team's project will be to develop and produce a product that can help to solve this uprising issue in the competitive market scenario. With our service, it can help to bring their cafes/ shops/ restaurants online with the help of Internet & technology. This platform will be able to store data for all cafes, coffee shops, restaurants and etc in our platform where citizens of Malaysia can use this web-based application that runs on any modern web browsers by any device they own that has internet connection to our service's platform.

The background of this project or in other words, the motivation & inspiration to develop this project is because currently there is no existing platform that is doing what the team is about to develop which stores data of all cafes, coffee shops, restaurants in every state of Malaysia. Except for some well known cafes, coffee shops, restaurants which are well known that can be found in Google Map services. Thus, our team was inspired to try out something new and to challenge ourselves in developing something huge which can be useful and beneficial to all age groups of people, which can be including our local citizens, tourists and visitors.

1.2 Background of Project

About our project, the inspiration came to us when our team were all realising the same struggle when it comes to selecting on which kopitiam to go to, or which to satisfy our cravings in Penang. At times, during a time crisis when our lunch break is short and it is during the peak hours of traffic jams, it is difficult for us to resolve our problem on deciding where is the nearest kopitiam to eat and has the food stalls which would satisfy us. Well, it is irrelevant for people to travel so far and get caught in the jam just to fulfill their desire which is not really something people need. With us, faced with an experience of getting lost while on the way to the kopitiam, and being stuck in massive traffic and being late to class and missing out on some important lesson, it is definitely a problem that needs to be solved. Thus, this idea was brought up among us where the team brainstormed on how to develop a proper solution which will be useful and beneficial to the public and society. Since there is currently no existing platform that provides this software services, the challenge is accepted by us to start building something which is the first to exist in our country.

In the process of turning our ideas into reality, which is to basically code out a program that does what was aimed to achieve. In order for the project to operate smoothly, our job must be delegated and distributed among all teammates. And we all agreed where Yeoh Chern Shi will be the one to handle the layout of our program. He is responsible for designing the master blueprint and setting the guidelines of designing the layout of our program. Followed by Ooi Chee Wei will be the one to beautify the program with CSS. He is responsible for making our webpage look more attractive. Next, Koay Ji Qian as the one to handle the database and extraordinary feature. He is responsible to ensure that all types of users are able to create an account and their private credentials are kept secure. Lastly, the master coder of this project, Dylan Ch'ng Huck Phin as the tech lead. He is responsible for most of the coding with features, the behavior, the functions and to ensure the program to operate smoothly with no errors.

As of the program itself, there are 4 types of users (guest, registered user, kopitiam owner, web admins). And the program is capable of allowing users to view kopitiam & stall, view rating & review, register an account, login/logout, manage their existing account, add/edit kopitiam review & rating, add/edit stall review & rating, add suggestion, manage kopitiam,

manage stall, approval of kopitiam ownership, approval of user's suggestion, remove kopitiam review & rating and remove stall review & rating.

1.3 Problem Statements

Up till this day, there are many things available on the Internet, information of anything can be easily found on the Internet. Literally almost everything is on the Internet, such as ; e-books, tutorials, movies, guides, pictures, video, news and etc. But what the focus is at right now is that food/drinks or cafes/coffee shops advertisements or recommendations are introduced mainly through people like Youtubers or Vloggers who stream videos or record video of them trying new food at new places. This is a mainstream method of advertising food through the Internet.

And yes, there are many alternative platforms which do what our team is about to do. Such as, Penang HoCiak Share Group in Facebook, Penang Food Hunter Group in Facebook, Penang Foodie in Instagram and etc. But that, are also a bunch of recommendations or suggestions from customers who have already been to the shop and give their opinion to the web admins , where the admins just approve and share whatever appropriate suggestions to their platform in social media.

But the reasoning behind our team trying to develop a web-based application system that could be useful and beneficial for the community. As for right now, in the present, there is no platform to go to that filters all the kopitiam by state, which is also capable of filtering the food stalls within a particular kopitiam and filter all the stalls in a state by the category of food choice the customers would like to search for.

Therefore, our platform will help to store and provide information for the users regarding kopitiams. Our system works almost the same as the platform service in Facebook or Instagram that were mentioned above. But ours, are not from social media platforms, but from an independent web-based platform. Besides that, the uniqueness of our system is that, the kopitiam owners have authority to add/edit information about their kopitiam and food stalls in our platform, and not only fully customers and web admins authority. Thus, food hunters can use this platform directly to find all the kopitiams available in their state/country or search according

to their cravings. Then, they can add reviews, ratings, suggestions to the system about the kopitiam which may be useful and beneficial for other customers as a recommendation.

1.3.1 Challenges faced by the team

There is no doubt that to begin and work on something new and does not exist yet, it is certain that the process of converting our ideas into reality will not be an easy work to do. This kind of project requires strong determination, mindset of never giving up & requires patience. During the course of developing this program, there were some struggles, problems and heat happening.

The first issue that occurred was, as a human being, it is a common thing that each of us possess our own strengths and weaknesses. Therefore, to work together with a team of people, it is not as easy as working in solidarity. In a team, it is a must to brainstorm and open up for discussion where information, ideas and knowledge must be shared among each other. With each individual with their own way of interpreting things, the way of approaching a problem must be analysed and discussed before approaching the issues. Meanwhile, each of us will have our own weak points as well, therefore, it is a must to help each other out during the process of developing this program.

Secondly, is the limitation of knowledge and lack of expertise. As mentioned earlier, to work on something new, it is difficult to get hold of what are the minimum criteria to fulfill or what are the basic requirements a customer would want to have while they use our service. Followed by, lots of research and development is required to be conducted in order to overcome this issue. Besides that, the need for feedback from the users are important as well, which will help us to look from a different aspect and to think outside of the box, in that case, during the early development, our lecturer and friends are our users/customers.

Thirdly, the lack of time and lack of skills to add more features into our project. During this 12 week course of development, the team has divided the workload in order to complete this project. But, that does not mean our program is complete with spectacular features or outstanding quality. But, during the start of this project, our goal is to be able to complete this program with the basic functionality which fulfills the criteria of being called a kopitiam management system where users can search for kopitiams through this service. After acquiring

a new skill set, then it is possible for us to implement more and more features until the deadline is near.

1.4 Aim of Project

The aim of this project is to **develop a web-based application where it can manage all kopitiam and users can discover all the kopitiam which include the details, reviews on the kopitiam and stall.** This service will be accessible by everyone with a modern device which has browsers and has connectivity to the internet. This user friendly service will be beneficial for any type of user and people of all age groups, as long as they know how to operate their device and know how to connect to the internet and use their browsers.

1.5 Objectives of the project

Objectives are crucial & vital in everything the team does. It helps to set general guidelines to our team as this could help us to move step by step closer to our goal from turning our vision and ideas into a real life product. Applying the SMART goal setting technique into our objective, this definitely helped us in designing a successful project management plan.

Our first project objective is to **carry out research on how to develop and manage a system** like this. Since there is no such existing service that does what our project will do. This is difficult for us to find reference or guideline when the project is in a planning phase. Luckily for us, our program was inspired by Yelp & Google Maps where it contains services likely to what our team is planning to develop. Lots of research and studies were made on knowledge that has a relation which is useful that can contribute to our developing process.

Our second project objective is to **establish the functional & non-functional requirements in our system**. It is important that our system must be able to perform and provide the basic functions of what it should do. During this analysing phase, a lot of research and surveys were conducted to find out what are the basic functionality a system must have and consist of sufficient functional & non-functional requirements are implemented into our system. Lots of thorough research were carried out in order to identify and list out the lists of requirements to ensure that our system will perform on par with other good service providers.

Our third project objective is to **establish the system design**. It is important to come up with a system design because it can portray as an overview of our software. To begin with this system design, there are several Unified Modeling Language(UML) can be used to visualize our software program by using a collection of data and diagrams, such as; Entity Relationship Diagram(ERD) , Use-Case Diagram & Use-Case Description, Activity Diagram, Database Design and etc. These could help ease during the development phase, as it is possible to point out some keypoint(such as strengths, weaknesses) based on SWOT analysis.

Our fourth project objective is to **design a user friendly user-interface (UI)**. During this designing phase, it is important that User Interface Design plays a big role in every program or project because the User Interface is the first thing a customer will experience upon using our service. It acts like the first impression of our system. Therefore, if the user interface is not friendly, compact, unattractive and misleading. The customers or users will not want to continue using it or would not recommend this service to others. Therefore, the functions, the menus, the content and labelling must be well planned and designed in a manner where it is simple to use, easy to understand yet attractive and addictive while using.

Our fifth project objective is to **begin with the development of our system**. During this implementing phase, everything that has been accumulated by us, will begin to be coded into our system. To ensure our system has all the functional requirements & non-functional requirements being coded to operate smoothly. According to our development process, the team is adapting and practicing the system development methodologies of Rapid Application Development (RAD), in precise, the Phased Development method. Where the team begins our planning, analysis, design, implementation to build the first version of our system. Then once the feedback of the first version has been compiled, the team will conduct the second analysis, design and implementation to build our second version of our system. Apart from that, once the team has all the functions working, the testing will be conducted to ensure that our program will operate smoothly and is able to convey the error messages to the user if they are not fulfilling the criteria while using the program.

Our sixth project objective is to **complete the system documentation of our system**. This documentation represents our program in theory or in a paper. Therefore, from a glance through this documentation, people will understand briefly of what our system is about and what it does. As for the developers, this documentation could help the developers to keep track of their progress and to stay on track throughout this development of this system.

1.6 Summary of each chapters

Chapter 1 : Introduction

This chapter is a brief documentation about the true intent behind the aim of this development of the system. Apart from that, what are the objectives and steps taken to achieve the end-goal of this development.

Chapter 2 : Primary Study / Literature Review

This chapter focuses on the feasibility or the practicability of this development, such as operational feasibility, technical feasibility and economic feasibility. Alongside with the research of features, reports, studies, publications what were useful and applicable documentation that were being used and implemented in the system.

Chapter 3 : System Analysis / Methodology

This chapter will be covering all about the development methodology practice during the development process, together with the development tools used plus functional and non-functional requirements of the system in theory.

Chapter 4 : System Design / Proposed Solution

This chapter is filled with diagrams as this chapter portrays the outline design, functionality, the flow for this whole system. This chapter will be designed to make the end-user understand how the system acts & behave from a user/customers' perspective where everything will be present through diagrams, tables and descriptions.

Chapter 5 : Implementation

This chapter will be the in depth explanation of the implementation of coding and features. Hence, there will be code snippets alongside with the brief description.

Chapter 6 : Testing

This chapter will be the section to carry out tests on the system when it comes to handling its functionality. There will be 2 types of testing conducted to analyse the behavior of this system which will be ; Black Box Testing & White Box Testing.

Chapter 7 : Conclusion & Future Recommendation

This chapter will be containing the summary of this whole development progress and process of this system along with the possible outcome if this system is able to evolve with more features and functions which will lead to a better service.

CHAPTER 2 : PRIMARY STUDY / LITERATURE REVIEW

2.1 Feasibility Study

Feasibility study is a must to be conducted to analyze the project/system in depth during the development process, planning stage. This study can be broken down into three parts which are; Operational Feasibility, Technical Feasibility & Economical Feasibility.

2.1.1 Operational Feasibility

Operational feasibility is also known as the study and measurement of a system in solving real life problems. This study is to analyse the strengths and weaknesses of this project. This is the primary study where the developers will be understanding the needs of the users and fulfilling them.

First of all, the system will be able to perform its basic functionality which is to display and open the interface with a filled plus operative website. When any type of user with the link goes into this website, the system must be able to be open from any browser with internet connectivity. Despite any type of device, the only requirement is to have a browser and internet connection.

Secondly, the data being displayed and stored in the database will always be up-to-date. It is important for a service to provide correct information to the users in real time, hence only this service is useful and important which is beneficial to the users. Plus, the aim of this system and service can be achieved and does add value to itself and to all the users.

Thirdly, this system will be able to fulfill the users request which is to search for kopitiam & stalls. Apart from that, if the users would like to see the rating & review of a kopitiam or stall, the system will be able to fulfill this request. Then the system will display and provide all the information regarding the searched kopitiam or food stalls to the users.

Fourth, this system will allow the new users which are the guest to register an account in the system. Thus, this will allow the registered user to have more functionality and capability to do more in the system. During this phase, their privacy data such as password for example will be hashed and encrypted to prevent hackers from getting the personal data. Besides that, once the user has registered any account in the system, they will be able to login and logout from the system. Followed by, the users will be able to manage and edit their personal information regarding themselves in the system, after that, the changes made by them will be saved.

Fifth, this system will be able to allow users to add/edit kopitiam review & rating into the system. At the same time, they will be able to add/edit food stalls review & rating as well. This will enable the users to leave comments and feedback in the system which other users can use as a reference and for recommendation to others. Besides, there are 4 types of suggestions the users can submit in the system which are ; #1 general suggestion, which can be for suggestions from users to the web admins for the website feedback and services feedback from our system. #2 kopitiam suggestion, which allows the users to give suggestions to the kopitiam. #3 food stalls suggestion, which allows users to leave feedback for the stalls. #4 ownership suggestion, which allows existing kopitiam created with no kopitiam ownership claimed yet, thus, the kopitiam owner will be able to give a suggestion to claim his/her kopitiam in the system.

Sixth, the system will allow kopitiam owners and web admins to manage kopitiam and stall. Meaning, they will be able to add and edit information regarding the kopitiam & food stalls in the kopitiam. If the kopitiam was not being created by the kopitiam owner but registered users suggestion this to the system which is approved by the web admins, the web admins will be able to add this kopitiam into the system in advance and on behalf of the kopitiam owner, and in the future, the kopitiam owner may give suggestion to claim ownership of his/her kopitiam and provide some evidence to get the approval from the web admins.

Lastly, the system will be able to allow web admins to have multiple administrators ability such as; the ability to approve kopitiam ownership by kopitiam owners when they apply for the ownership with some documentation as evidence provided. Next, the ability to approve users' multiple types of suggestion, then the user will be notified whether their suggestion has been acknowledged by the web admins. Followed by, the ability to remove kopitiam review & rating and food stall review & rating left by the users. If the reviews and rating does not fulfill the guidelines and contain offensive content, hence the web admins will have the authority to remove the review & rating left by the users.

From the detailed analysis above, the developers believed that the proposed web-based kopitiam management system will be able to serve the needs of the users and fulfill the aim & purpose of this service. Thus, this system will definitely bring more positive impact but the team will be constantly working on lowering the negative impact and consistently working to improve the overall efficiency on handling requests made by the users and ways to improve the usability of the system.

2.1.2 Technical Feasibility

Technically speaking, is Kopitiam Management System Pro feasible? Yes it is. This is because the technologies planned to be used are well proven. Meaning that there are bucket loads of references one can consult to to get inspired. To get advice, tips, tricks and guidance. Additionally utilizing well proven technology avoids the discovery of undiscovered problems which can be deadly for a project like Kopitiam Management System Pro which is to be developed by a few individuals over a short period of time.

The technologies used are also powerful. The limitations of the technologies planned for use will be hard to reach. Often, it's the developers' limits that are met first before the technology limitations. The technologies most crucially also fully compatible with one another. Each technology planned to be used has a unique purpose and when together forms a suite of technologies where all planned features, functions, design ideas can be done. .

The developers are already well educated on the proven technologies to be used due to completion of hours of relevant worksheets, tutorials, lab work, practical work, and assignments which lead to the passing of courses in college related to the proven technologies such as “DDS1144 Database Systems”, “DVB1134 VB Programming” and “DUD1204 User Interface Design”.

The technologies chosen are not the latest technologies but they are still great. Has been used for various other projects by various other individuals around the world over many years. Many of these projects are accessible through the world wide web with a search engine. Viewing these sites, the sites especially with similar but different features to what is planned further proves that Kopitiam Management System is technically speaking feasible.

2.1.3 Economical Feasibility

Economic feasibility is also known as the analysis of a project's costs of production and revenues from the service in return to determine this system is sustainable or reasonable to invest the time and effort in making this service a real product to be delivered to the society to use this system. During the planning phase, the developer team has gathered and investigated the development and operational cost together with the tangible and intangible benefits of this system.

With regard to the development cost, currently up till this day, the team has not need to pay a single cent throughout the process of developing this prototype for the kopitiam management system. The team's computer and laptop used were running on Windows 10 Operating System which is free upon purchasing their device. Next, to program the codes, the team has used Visual Studio Community 2019. This is a programming software which is a free integrated development environment (IDE) with developer tools which are free and it comes with fully-featured and extensible software to create modern applications for all types of platforms such as Android, iOS, Windows as well as all the web applications with cloud services. This IDE has its own ecosystem, which allows access to lots of programming extensions and it is possible to code in multiple languages such as C# , C++, Visual Basic, HTML , Javascript, Python and many more. As for the development process, programming languages and database used were asp.net for web application development , aspx pages for front-end coding , vb.net for back-end coding , ado.net for database manipulation , MsSQL for database management and storage system and visual studio code to help with auto-formatting and assisting with the building and debugging. Besides that, Windows paint and editor were used to design the system's logo which is free and pre-installed in the device.

For the operational cost, the system is currently still running on a local host, where this system is only accessible from the computer used to create this coding or any computer with these codes. But in future when the team has polished everything and decided to host it on a web server for all accessibility to all people, the cost of hosting this system on an actual server will cost from RM1.50 per day up to RM5.60 per day on Microsoft Azure web server hosting. These cloud services are pay-per-use, which is good because it is manageable and flexible.

As for the benefits of this kopitiam management system pro, it can be broken down into 2 categories which are tangible and intangible benefits. To put it in simple terms, tangible benefits are measurements on something which is quantified and measurable whereas, intangible benefits are measurements on something which is difficult and almost impossible to quantify, but subjective towards personal perspective such as the satisfaction of qualities of the service, system or product.

- List of tangible & intangible benefits are ;

Tangible Benefits	Intangible Benefits
Increase in quantity of users	Increase in quality of system usability upon using this system
Less time spent in search of kopitiam by the users	Increase in quality of users satisfactory upon using this system
	Enhanced user-interface and experience upon using this system
	Provide a universal platform accessible by any kind of device & browsers with internet connectivity

From the detailed analysis above, the developers concluded that the proposed web-based kopitiam management system is possible to develop with low and minimal cost for the development and operational process. The benefits of this system will be able to benefit and bring more positive impact compared to the negative impact to all the users of this system.

2.2 Critical Review of literature relevant to the project

	Kopitiam Management System Pro	Google Maps	Yelp
FUNCTIONALITY			
Register account			
Login	✓	✓	✓
Logout	✓	✓	✓
Manage account	✓	✓	✓
Search & View	✓	✓	✓
Put review	✓	✓	✓
Edit review	✓	✓	✓
Delete review	✓	✓	✓
Give rating	✓	✓	✓
Edit rating	✓	✓	✓
Delete rating	✓	✓	✓
Suggestion / Feedback	✓	✓	✓
Like Review	✗	✓	✓
Manage kopitiam & stall	✓	✗	✗
View on map	✓	✓	✓
Approval of kopitiam ownership	✓	✓	✓
Approval of user's suggestion	✓	✓	✓
Removal of kopitiam review & rating	✓	✓	✓
Removal of stall review & rating	✓	✓	✓

HARDWARE REQUIREMENTS			
Mobile Device Support	✓	✓	✓
Laptop / PC Support	✓	✓	✓
SOFTWARE REQUIREMENTS			
Operating Systems	✓	✓	✓
Requires Browsers	✓	✗	✗
OTHERS			
Internet Connectivity	✓	✓	✓
Work Online	✓	✓	✓
Work Offline	✗	✓	✗

2.3 Literature Review

2.3.1 Image Processing & Detection

YOLOv3(You Only Look Once version 3)

YOLO algorithm

It splits an input image into $S \times S$ grids (typically cutting the image into multiple equal squares) and generates multiple bounding boxes across the image then gives a score (Confidence value) to each bounding box. At the same time, it generates a class probabilities map across the image in the $S \times S$ grid. So, for each bounding box which has a higher score (Confidence value) will be selected, classified and located in the image. So, the output will be b_x , b_y the centre of bounding box; b_w , b_h width and height of bounding box; c the class identified and p_c the confidence value that had been processed by using non-max suppression algorithm to eliminate unwanted bounding boxes (AMBIKA CHOUDHURY, 2019). Also, it does multiple detection on single objects that have been trained for close relations. For example: Car, SUV and Sports Car.

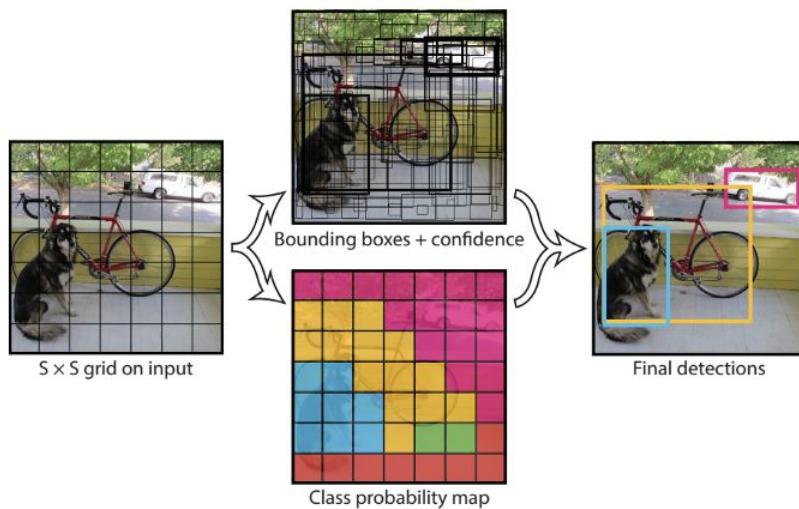


Figure 2.3.1.1 : Demonstrate how the YOLO object detection is performed (Rohith Gandhi, July 2018)

Why YOLOv3?

YOLOv3 supports faster custom object detection and in exchange for accuracy than RetinaNet, R-CNN, SSD and other neural networks. It is being more flexible and easier to use when it comes with custom object training. Also, it supports real time detection in maximum frame rate at 30 frames per second to perform object detections. Because the system supports almost all platforms such as Linux, Windows and Apple IOS. However, in the process of training, it is best relying on GPU and higher specification for faster training. For example, during the process of our project object training it takes almost 80 hours for 2700 total images, 18000 recursive for training using Google Colaboratory which provides best at Nvidia Tesla K80 GPU and other GPU by availability for 12 hours with shortcuts of pre-trained neural network. It is best using multiple GPUs that can speed up the training process at extreme efficiency because of specifications for CNNs and Deep Learning Process. However, the only fastest way to this product is purchasing Google Colaboratory Pro which provides the best they have that is only available in the United States of America. Which provides unlimited time for the processes and is more fluent while training.

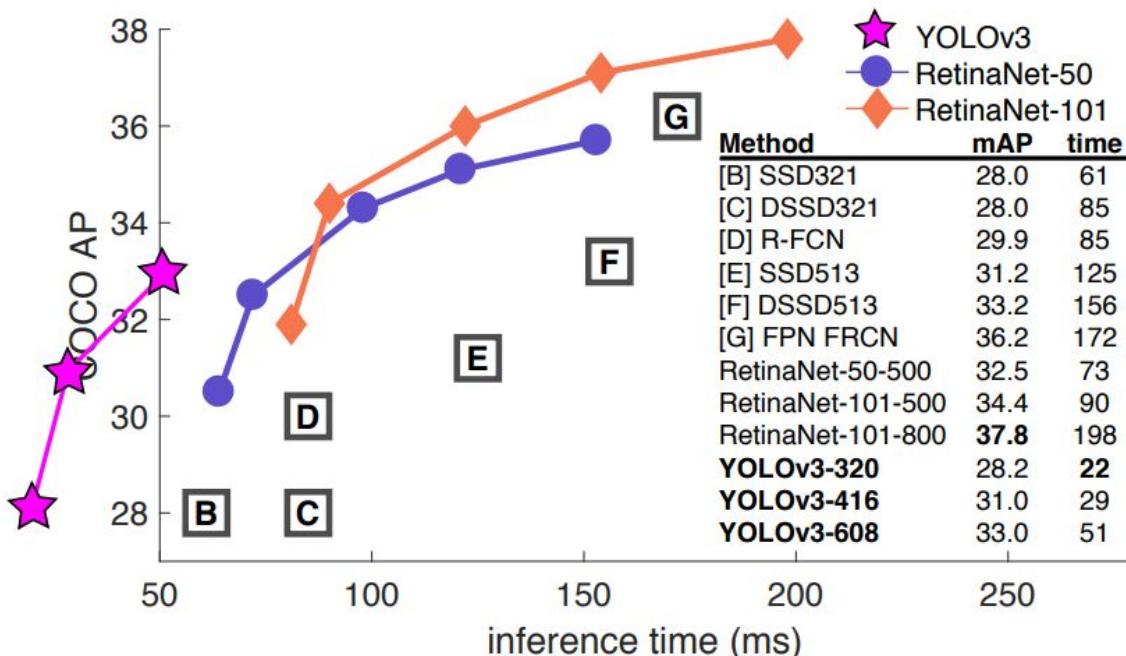


Figure 2.3.1.2 : Figure above shows the speed for object detection compared to other systems based on developer's computer specifications. It does significantly faster than others. However, that mAP (Mean Average Precision) is slightly lower from the highest one. (Redmon, Joseph and Farhadi, Ali, 2018)

Although there is a new version which is YOLOv4. It is unnecessary to put such an advanced neural network into the project. Since it features even faster real time object detection which can be up to hundreds of frames per seconds depending on the GPU used. YOLOv3 is enough to be implemented into the project.

Darknet - 53:

YOLOv3 uses Darknet-53 to perform feature extractions that were created by combining their previous versions: (YOLOv2, Darknet-19) and other different networks. As the developer says, Darknet - 53 is the backbone of YOLOv3 (Redmon, Joseph and Farhadi, Ali, 2018) it is one of the most important modules in the process. It has 53 convolutional layers that can split an image into very small sections, so it can detect smaller objects in a limited size image. Due to it being written in C-Language and combined with CUDA technology, it allows GPU computations in computers instead of CPU which is hundreds times faster than a normal CPU process. Additionally, Darknet-53 uses 3x3 and 1x1 filters and in addition shortcut connections to outperform its previous versions.

Type	Filters	Size	Output
Convolutional	32	3 x 3	256 x 256
Convolutional	64	3 x 3 / 2	128 x 128
1x	32	1 x 1	
	64	3 x 3	
	Residual		128 x 128
Convolutional	128	3 x 3 / 2	64 x 64
2x	64	1 x 1	
	128	3 x 3	
	Residual		64 x 64
Convolutional	256	3 x 3 / 2	32 x 32
8x	128	1 x 1	
	256	3 x 3	
	Residual		32 x 32
Convolutional	512	3 x 3 / 2	16 x 16
8x	256	1 x 1	
	512	3 x 3	
	Residual		16 x 16
Convolutional	1024	3 x 3 / 2	8 x 8
4x	512	1 x 1	
	1024	3 x 3	
	Residual		8 x 8
Avgpool		Global	
Connected		1000	
Softmax			

Figure 2.3.1.3: Structure of Darknet-53 (Redmon, Joseph and Farhadi, Ali, 2018)

Darknet - 53 is more powerful than its previous version Darknet - 19 and it is more efficient than ResNet - 101 and ResNet - 152. According to the developer's test based on the Titan X GPU at 256x256 resolutions, the runtime of Darknet - 53 is 1.5 times faster than ResNet - 101 and double the speed of ResNet - 152 at the similar performance. Which means it better utilizes the GPU to make it faster and more efficient. (Redmon, Joseph and Farhadi, Ali, 2018)

However, Darknet-53 is designed to support Nvidia CUDA technology, so it does not support the latest TPU(Tensor Processing Unit) which processes decently high efficiency in CNNs. Which means that the Tensor Processing Unit can process multiple objects concurrently. Also TPU is currently only available in Google's Virtual Machine and it is impractical for normal usage other than doing multi-dimensional processing. But it is worth waiting for the newest Darknet Convolutional Neural Network which supports TPU so there will be highly shortened time taken on training the YOLO model.

Alturos YOLO:

Alturos YOLO is used to implement the model into a project which is a reference from NuPackage in Visual Studio. Although it is written in C#, it also supports Visual Basic code since Visual Basic compilers are compatible with multiple languages which is the advantage of using this language as the main language in the project. It is chosen because it is simple and it is an easier usage that needs only to import the class and start to be detected by the functions rather than implementing ONNX (Open Neural Network Exchange) that allows training over time and using too much computing power. Hence, the WEIGHT file(Model) is easier to change by directly replacing the existing Pre-trained model file into a custom trained model.

Additionally, Microsoft Azure does provide the Computer Vision API which also has the same detection functions and even more like OCR and Face Recognition. However, it is a subscription based model which needs to subscribe to Microsoft Azure to use these products. Also, based on the limitations from their image detections, YOLOv3 does better than it which it can detect closely arranged objects and have a smaller object detection sensitivity.

So Alturos YOLO helps to bring out the YOLO model into the project written in Visual Basic for object detection which provides more accuracy and precision. And it acts as a middle man or an adapter which takes the communications between Visual Studio and the YOLO model.

Implementation for this system:

The main purpose this system implements in the project is to filter the irrelevant images uploaded to the server and occupy too much space in the database. It will act as the first line of filter that once a user uploads an image, it will send it to the server via temporary storage or Random Access Memory (RAM) to perform filter and analysis. Once accepted it will prompt success to users and save it into the database. If rejected, the image will be discarded from temporary storage.

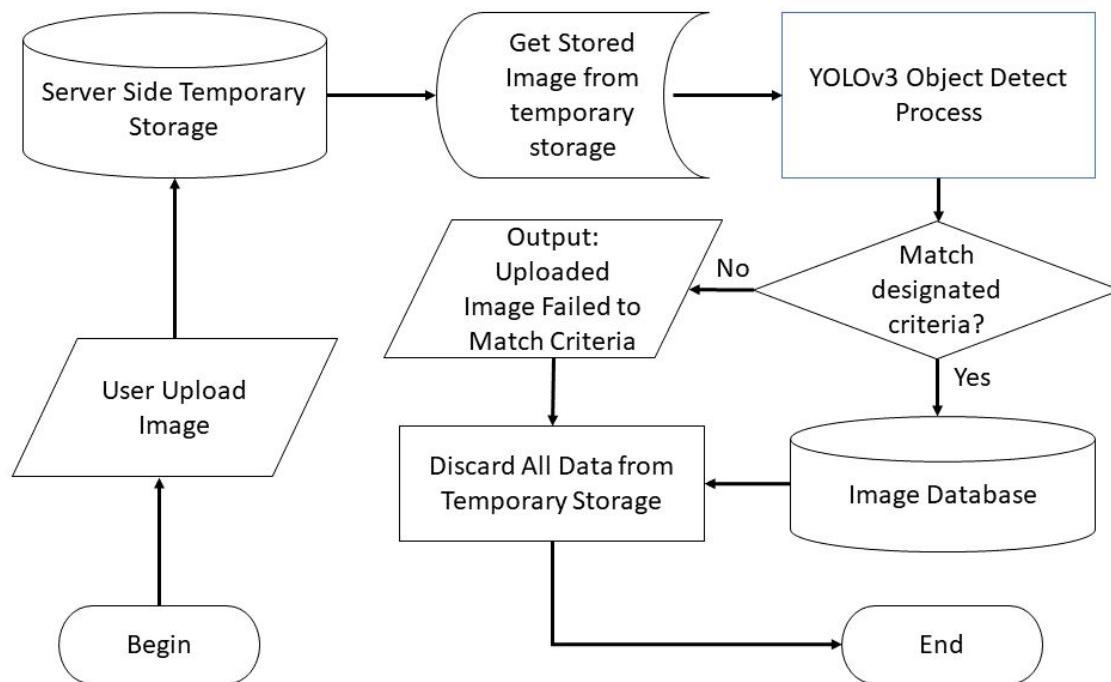


Figure 2.3.1.4 : Flow Chart of implementing YOLO model in project

In the code, the system will act as a function that is for checking and validating the picture uploaded by the user. So that it will return values to the caller to do further actions. The explanation of the source code function will be shown below:

At the beginning of the function, there will be many variable initializations which are mostly the get and set paths to the server and the image file names.

```
Dim cD = New Alturos.Yolo.ConfigurationDetector  
Dim config = cD.Detect(detectorPath)  
Dim wrapper = New YoloWrapper(config)
```

Figure 2.3.1.5: Source code for configure the YOLO detector

Before using the function, it first needs to install and import the YOLO class into the project. The configurator will auto detect the file needed from the path provided. So that the wrapper will wrap all content and be ready to detect. The configurator mainly detect three files which is format of '.cfg' - YOLO Configuration File, '.WEIGHT' - The main component of YOLO which consist the neural network pre-trained previously and '.name' file which contain a list of object types provided from training.

```
'Set image into grey scale  
Dim Img As Bitmap = New Bitmap(imagePath)  
Dim gsImg As Bitmap = New Bitmap(Img.Width, Img.Height, System.Drawing.Imaging.PixelFormat.Format32bppArgb)  
'Set indexed image into non indexed image  
Dim tempGraf As Graphics = Graphics.FromImage(CType(gsImg, Image))  
tempGraf.DrawImage(Img, 0, 0)  
tempGraf.Dispose()  
Img.Dispose()  
  
For y As Integer = 0 To gsImg.Height - 1  
    For x As Integer = 0 To gsImg.Width - 1  
        Dim c As Color = gsImg.GetPixel(x, y)  
        Dim r As Integer = c.R  
        Dim g As Integer = c.G  
        Dim b As Integer = c.B  
        Dim avg As Integer = (r + g + b) / 3  
        gsImg.SetPixel(x, y, Color.FromArgb(avg, avg, avg))  
    Next  
Next
```

Figure 2.3.1.6: Source code of converting image into grayscale.

From some research, some object detection works best at greyscales, so that by converting the uploaded images into grayscale, the result will be in better accuracy. However, for some objects which have an unobvious form, coloured images will be able to help to be detected. So that the whole function will have an object detection process running twice.

```

Using(wrapper)
    Dim item = wrapper.Detect(imgPath)
    GridView1.DataSource = item
    GridView1.DataBind()
End Using

```

Figure 2.3.1.7 : Source code for object detection process

After all configuration is set, the detection is ready to detect the image from the designated file path. The class will return a table that represents the results from the detection process. Also, the configurations can be reused without reinitializing them again. The example results will be below (Right) from image detected (Left) the result was retrieve from 2 detection process which is coloured and grayscale :



Type	Confidence	X	Y	Width	Height
Food	0.668069779872894	553	114	219	211
Plate	0.320661246776581	528	129	265	210
Plate	0.264845013618469	184	289	394	363
Plate	0.914990425109863	599	412	412	330

Figure 2.3.1.8 : Sample result returned after detection process.

After the detection process, the result will be shown on the table which has eliminated redundant data. The table provides the type of object, confidence which is the “Score” given that matches the neural network data, X and Y coordinates of the center point of the detected object and the width and height of the detected object.

```

For Each row In ObjectDetectedGridView.Rows
    resultObjects = resultObjects & row.Cells(0).text & " "
    If row.Cells(0).text = "Billboard" Then
        'Get rectangle Data
        Dim bbWidth As Integer = Integer.Parse(row.Cells(4).text)
        Dim bbHeight As Integer = Integer.Parse(row.Cells(5).text)
        Dim rectX As Integer = Integer.Parse(row.Cells(2).text)
        Dim rectY As Integer = Integer.Parse(row.Cells(3).text)
        Dim rect As Rectangle = New Rectangle(rectX, rectY, bbWidth, bbHeight)
        Dim image As Bitmap = Bitmap.FromFile(greyScaledImgFilePath)
        'Draw a bitmap according to rectangle size
        Dim cropImage = New Bitmap(bbWidth, bbHeight)
        Using grp = Graphics.FromImage(cropImage)
            grp.DrawImage(image, New Rectangle(0, 0, rect.Width, rect.Height), rect, GraphicsUnit.Pixel)
        End Using
        Dim cropFn As String = "Crop_Billboard" & row.cells(2).text & ".jpg"
        Dim cropPath As String = Path.Combine(Server.MapPath("~/Images/"), cropFn)
    End If
Next

```

Figure 2.3.1.9 : Source code of crop image

The next process will be letting the OCR to validate the billboard. So that it makes things easier, the system will crop out the Billboard from the image user uploaded and according to the result provided from YOLO object detection. About the OCR (Optical Character Recognition) will be explained in the next section.

```

If resultObjects.Contains("Table") AndAlso resultObjects.Contains("Chair")
    Return "VALID"
ElseIf (resultObjects.Contains("Table") Or resultObjects.Contains("Chair"))
    Return "WARNING"
Else Return "INVALID"
End If

```

Figure 2.3.1.10 : Partial source code of function return value

Finally the function will meet the end and start to compare and return the value to the caller. There will be three criteria to be returned which is “VALID” - Image fully meets criteria, “WARNING” - Image partially meets criteria and “INVALID” - Image does not meet criteria. For the caller, it will continue taking actions using the result returned from the function.

However, although the system is fully trained the accuracy is still not fully functional which the reasons may be many. The main reason is the dataset for training is not enough. The model only uses about 300 images for training and due to the time taken will be exponentially increased as the dataset number increases. Also Google Colabotory only allows 12 hours per session (Colab Pro, n.d.) which need to do backups and retrain for the model. So, during the stop time, the connection inside the neural network will be not accurate and might be disconnected.

To pursue the best accuracy and better model design, the only process is to retrain the model. It is better not to be continued or added more classes for the best accuracy and better performances. So the model in this system is just the demo version which did not fully train and insufficient dataset. For the better version the model will take a significant amount of time to train and will take more storage on disk.

CHAPTER 3 : SYSTEM ANALYSIS / METHODOLOGY

3.1 Requirement Specification

In this following chapter, it will cover the requirements that are necessary and fundamentals of the system, both functional and non-functional requirements that both work hand in hand together which makes up a fully functional system.

3.1.1 Functional Requirement

This system consists of 4 types of user which are ; guest , registered user , kopitiam owner & web admins.

- **Functional Requirements as a Guest.**

1. This user must be able to search and view for kopitiams & stalls in the system.
2. This user must be able to search and view for reviews & ratings in the system.
3. This user must be able to register for an account in the system.

- **Functional Requirements as a Registered User.**

1. This user must be able to search and view for kopitiams & stalls in the system.
2. This user must be able to search and view for reviews & ratings in the system.
3. This user must be able to register for an account in the system.
4. This user must be able to login & logout from their account in the system.
5. This user must be able to edit & manage their account in the system.
6. This user must be able to add/edit kopitiam review & rating into the system.
7. This user must be able to add/edit stall review & rating into the system.
8. This user must be able to give suggestions in the system.

- **Functional Requirements as a Kopitiam Owner.**

1. This user must be able to search and view for kopitiams & stalls in the system.
2. This user must be able to search and view for reviews & ratings in the system.
3. This user must be able to register for an account in the system.
4. This user must be able to login & logout from their account in the system.
5. This user must be able to edit & manage their account in the system.
6. This user must be able to manage kopitiam in the system.
7. This user must be able to manage stalls in the system.

- **Functional Requirements as a Web Administrator.**

1. This user must be able to search and view for kopitiams & stalls in the system.
2. This user must be able to search and view for reviews & ratings in the system.
3. This user must be able to register for an account in the system.
4. This user must be able to login & logout from their account in the system.
5. This user must be able to edit & manage their account in the system.
6. This user must be able to add/edit kopitiam review & rating into the system.
7. This user must be able to add/edit stall review & rating into the system.
8. This user must be able to give suggestions in the system.
9. This user must be able to manage kopitiam in the system.
10. This user must be able to manage stalls in the system.
11. This user must be able to approve kopitiam ownership in the system.
12. This user must be able to approve the user's suggestion in the system.
13. This user must be able to remove kopitiam review & rating in the system.
14. This user must be able to remove stall review & rating in the system.

3.1.2 Non-Functional Requirement

- **Reliability**

The system must be able to perform consistently well on what it is designed to do.

- **Availability**

This system must be available and online to be used for 24/7.

- **Usability**

This system must have a user-friendly interface and be easy to use as a new guest or user.

- **Accessibility**

This system must be accessible by everyone with a device as long as they have connectivity to the Internet & a browser.

- **Accuracy**

This system must be able to provide accurate real-time data & information.

- **Security**

This system must have good security protecting data and protection against any kind of hacking & malwares such as sql injections.

- **Confidentiality**

This system must not provide users' private information to anyone else except being used in this system itself.

- **Redundancy**

This system must be able to detect redundant accounts while guests create new accounts or actions such as when users submit multiple suggestions a day which may spam our web admin's suggestion logs.

3.2 Process of System Development

The process practiced and carried out by the team while developing the system is by adapting to the Rapid Application Development (RAD) methodology, in precise which is the Phased Development method. Phased product development methodology practice breaks down an overall system into a series of versions that are developed sequentially. The advantages of our team using this methodology is that it is easier to adjust or make amendments to the coding, able to build more quality end-product & it is easier to catch bugs or fix problems when the system is built from small parts, that enable us to detect errors easier too. The disadvantages of our team using this methodology is that this method may be time consuming & might affect us if our team develops this project under a short time constraint and less features being implemented as it takes multiple versions to add more features into the system.

Firstly, during the planning phase, before the development process starts, our team had a brainstorm session on ideas, plans & suggestions. After discussion with the project supervisor, the team has all agreed on the title of selection for this project development and successfully gotten the approval from the project supervisor. Next, studies and research were conducted to find out more about any existing application which may be useful and which has relation to what our system will be. Studies on how the applications operate and search for which APIs were used and etc. Researches on what are the necessity and the basic functions plus features in their application.

Secondly, during the analysis phase, our team planned and listed out all the functional and non-functional requirements to be implemented into our system and followed by which software will be used to develop the system, in our case; vb.net , asp.net , ado.net , MSSQL , aspx pages & Visual Studio Community 2019 with Visual Studio Code. Lots of thorough research were carried out for additional knowledge and skill sets which were not taught and our team has to self-study and self-taught to implement the additional features that will be used in our system. Detailed researches were put into our literature review regarding the exploration of new skill sets.

Thirdly, during the design phase, the first thing our team did was to design the UML diagrams which may help to portray as an outlook of our system and it can be used to visualize our software program by using a collection of data and diagrams, such as; Entity Relationship Diagram (ERD), Use-Case Diagram, Use-Case Description, Activity Diagram & Database Design. Once done, the team proceeds to design the user-interface of our system by sketching out a paper prototype of our master blueprint design for the entire system.

Fourth, during the implementation phase which is the last stage, all information, ideas, researches, studies and every accumulated data from theory have been transferred into coding. Our team uses the phased development process, therefore, multiple versions were made during the 12weeks course of this subject. Turning everything from fictions and writings into codes of line and making our product a real product with its aim of developing this system.

Finally, towards the end of all the phases, when the system is completed. Our team has conducted a few tests to find bugs and errors occurring in our system. White box testing and Black box testing were conducted in order to be precise with our testing of our program.

▼	UDW v13.zip	...
▼	UDW v12.zip	...
▼	UDW v11.zip	...
▼	UDW v9.zip	...
▼	UDW v8.zip	...
▼	UDW v7.zip	...
▼	UDW v6.zip	...
▼	UDW v4.zip	...
▼	UDW v3.zip	...
▼	UDW v2.zip	...

Figure 3.2.1 List of version for this system during the process of phased development

The diagram above is an outcome of our process while developing our system with the adaptation of phased development methodology. Multiple versions were created alongside with new features and additional functions plus fixes of errors.

3.3 Development Tools & Methods used

The main programming language used in the Kopitiam Management System is Visual Basic as the backbone of the whole project and ASP.NET as the display webpage. The reason behind these programming languages are chosen is that Microsoft provides this platform and lets developers more focus on program efficiency and functionality. It allows a much easier way to develop the project and shorten the time taken during development. Also, Microsoft Visual Studio has many extra functionalities such as Database, External Plug-ins and references that are required in the development of the project.

Hence, Visual Basic has shorten the time taken on coding that instantly points out the errors on the spot. Visual Basic changed the programming method into a very easy state that almost anyone can understand the code. So it is the best use of programming language for the current situations which can be done in limited time for most of the efficiency among the programming that has been learnt previously.

The .Net framework programming is a software development ecosystem designed by Microsoft in the late 90s. The concept originated with the basic purpose of making a platform based to allow easy application engineering on a desktop and web application development. The platform is currently used in different types of applications and .Net programming suits a lot of businesses and services that aim for a broad range of extra features in web-based services, desktop application software and any cloud infrastructure support services.

The purpose of choosing .Net Framework Programming as the main programming language to work on this project is because .Net is suitable best for scalable products/services. Due to Kopitiam Management System which is something new and there is still plenty of room for improvements, the service will expand and .Net is capable of scaling according to developer's needs. It is able to adapt to the environment which still allows redesigning to the ongoing applications.

Besides this, .Net Framework is suitable for cross platform needs which will save the time and effort to code multiple times such as for Android & IOS. This is flexible as .Net will be a great choice as it covers most of the platform such that it is compatible and adaptive to desktop

operating systems and even in mobile applications which run on any browser and which has connectivity to the Internet will be able to access this service.

The downfall of .Net Programming is the limitation of Object Relational Support as it is known that .Net uses the approach of Object Oriented Programming language style. Where the project coding is represented by objects with data rather than steps or actions with logic. The way of handling data-oriented software application development in .Net is aided by Entity Framework. The entity is an object relational mapper (ORM) where it links object oriented databases in .Net Framework. It is believed that Entity Framework isn't fully flexible and may not fully support all the database design in it.

In addition, .Net may be a free software development tool but not everything is free, getting the license of publishing our software is costly and not really affordable by all regardless of the free and open source technology and tools. The cost of licensing may range from hundreds to a few thousands from an annual standpoint.

CHAPTER 4 : SYSTEM DESIGN / PROPOSED SOLUTION

4.1 Use-Case Diagram

Appendix A : Use-Case Diagram

A use case diagram is the simplest and most primary form of representation of an overview of a user's interaction with the system. This diagram is capable of showing the relationship between all the user types and the activity that is capable of being performed by the users. The users are classified as actors, the system is a big rectangular box in the middle & the activity is represented by a use case bubble.

Appendix A shows a Use Case Diagram of our system. In our system, it contains 4 types of users alongside with 14 types of use case bubbles which are the functional requirements of all the users.

To see each type of user & its functional requirements, it is written under section 3.1.1, page 34 - 35 .

To see the diagram, it is located under section appendices, page 135 .

4.2 Use-Case Description

Appendix B1 - B14 : Use-Case Descriptions

A use case description describes a flow of task that is performed by the actor(s). It also provides an outline from a user's perspective towards the system's behavior on how it responds to the user's request. The use case description contains the summary of the system's behavior, the actors, actions that trigger the function, primary scenario, alternative scenario, exceptional scenario, pre-conditions, post-conditions & assumptions of the end of outcome if it goes according to the flow.

Appendix B shows all the detailed descriptions written out in 14 description tables based on the use-case diagram, each description contains all the functional requirement flow, triggers, actors & many more about it.

To see each type of user & its functional requirements, it is written under section 3.1.1, page 34 - 35 .

To view further about description, it is located under section appendices, page 136 - 149.

4.3 Entity Relationship Diagram (ERD)

Appendix C : Entity Relationship Diagram (ERD)

An entity relationship diagram (ERD) displays the relationship between entities that is stored within the database. A database is used as a collection of data that is permanently stored within a computer storage. The ERD also represents a conceptual view of the system as a whole. The main components in an ERD are entities, attributes & the relationships between entities.

Appendix C shows the full diagram and relationship between all the entities existing in our system. In the system, there are 12 entities and each entity has its own attributes in it. Each entity is connected with each other with the help of lines and arrows as it represents the relationship between the entities.

To see the data dictionary, it is written under section 4.3.1, page 45 - 48.

To see the diagram, it is located under section appendices, page 150 .

4.3.1 Data Dictionary

Food

Field Name	Data Type	Field Size	Description
Id	int	-	Food id number
Name	varchar	50	Name of food
CategoryId	int	-	Refer to category of food

Category

Field Name	Data Type	Field Size	Description
Id	int	-	Category id number
Name	varchar	50	Name of category

General Suggestion

Field Name	Data Type	Field Size	Description
Id	int	-	General suggestion id number
UserId	int	-	User id number
Comment	varchar	MAX	Comment for improve webpage
Date	date	10	Date of the suggestion given by user
Status	varchar	10	Allow administrator to do marking

Kopitiam

Field Name	Data Type	Field Size	Description
Id	int	-	Kopitiam Id number
Name	varchar	50	Kopitiam name
StateId	int	-	State Id number
Address	varchar	MAX	Address of kopitiam
OwnerId	int	-	Owner Id number
OpHourSt	time	7	Start of operation hour
OpHourEn	time	7	End of operation hour
OpDayOfWeek	varchar	66	Operation day of week
Status	char	10	Status of kopitiam
Halal	tinyint	1	Halal or not
mainImageData	varbinary	MAX	Kopitiam image in binary form

Kopitiam Suggestion

Field Name	Data Type	Field Size	Description
Id	int	-	Kopitiam suggestion Id number
UserId	int	-	User Id number
StateId	int	-	State Id number
Name	varchar	50	Name of kopitiam
OpHourSt	time	7	Start of operation hour
OpHourEn	time	7	End of operation hour
OpDayOfWeek	varchar	66	Operation day of week
Date	date	10	Date of suggestion given by user
Status	char	10	Allow administrator to do marking
Halal	tinyint	1	Halal or not
imageData	varbinary	MAX	Image in binary form

OwnerSuggestion

Field Name	Data Type	Field Size	Description
Id	int	-	Picture Id number
UserId	int	-	User Id number
kopitiamId	int	-	Kopitiam Id number
Date	date	10	Date of picture uploaded
Status	char	10	Allow administrator to do marking
Code	int	-	Code for admin to verify ownership

Picture

Field Name	Data Type	Field Size	Description
Id	int	-	Picture Id number
kid	int	-	Kopitiam Id number
StallId	int	-	Stall Id number
Picture name	varchar	10	Name of picture
Date	date	10	Date of picture uploaded
imageData	varbinary	MAX	Image in binary form

Review

Field Name	Data Type	Field Size	Description
Id	int	-	Review Id number
kid	int	-	Kopitiam Id number
Stallid	int	-	Stall Id number
UserId	int	-	User Id number
Comment	varchar	MAX	Comment of user
Date	Date	10	Date of review post on webpage
OverallRating	float	-	User rating in terms of overall
FoodRating	float	-	User rating in terms of food
HygieneRating	float	-	User rating in terms of hygiene
ServiceRating	float	-	User rating in terms of service
ValueRating	float	-	User rating in terms of value

Stall

Field Name	Data Type	Field Size	Description
Id	int	-	Stall Id number
kid	int	-	Kopitiam Id number
Name	varchar	50	Name of stall
OpHourSt	time	7	Start of operation hour
OpHourEn	time	7	End of operation hour
OpDayOfWeek	varchar	66	Operation day of week
food_id	int	-	Food Id number
Halal	tinyint	1	Halal or not
mainImageData	varbinary	MAX	Image in binary form

Stall Suggestion

Field Name	Data Type	Field Size	Description
Id	int	-	Stall suggestion Id number
UserId	int	-	User Id number
kid	int	-	Kopitiam Id number
Name	varchar	50	Name of kopitiam
OpHourSt	time	7	Start of operation hour
OpHourEn	time	7	End of operation hour
OpDayOfWeek	varchar	66	Operation day of week
food_id	int	-	Food Id number
Date	date	10	Date of suggestion given by user
Status	char	10	Allow administrator to do marking
Halal	tinyint	1	Halal or not
imageData	varbinary	MAX	Image in binary form

State

Field Name	Data Type	Field Size	Description
Id	int	-	State Id number
Name	varchar	10	State name

User

Field Name	Data Type	Field Size	Description
Id	int	-	User Id number
Name	varchar	50	User name
EmailAddr	varchar	50	User email address
UserType	int	-	Type of user
Password	varchar	50	Password of user used to login

User Type

Field Name	Data Type	Field Size	Description
Id	int	-	User type Id number
name	varchar	20	User type name

4.4 Activity Diagram

Appendix D1 - D4 : Activity Diagram

An activity diagram is a graphical form of representation of the workflows of activities based on each type of actors and its actions and possible actions that is able to perform by the actors. It is also a visual description of the flow of activities explained with the aid of symbols & components. The activity is also known as the operation of the system.

Appendix D1 - D4 shows an Activity Diagram of our system. In our system, it contains 4 types of users alongside with 14 types of use case bubbles which are the functional requirements of all the users. Thus, each type of user has its own performable activities and the flow from one activity to another. There are 4 types of activity diagrams performed by 4 types of actors.

To see each type of user & its functional requirements, it is written under section 3.1.1, page 34 - 35 .

To see the diagram, it is located under section appendices, page 151 - 154 .

4.5 User-Interface Design

Appendix E : Master Blueprint of Design

A user interface (UI) design is the graphical interface presentation of a system on the computer screen or any devices' screen. It is also known as the face of the system which is the most important part when it comes to usability by the customers or users. The UI plays a very big role in attracting the users to use it as it represents the first impression of the system, therefore, it must be very user-friendly and intuitive for the new users or any existing users. It must be easy to understand and easy to access with not much of complication which may affect the users and losing them even before they proceed to using the system or service.

A master blueprint of the system is also an important design when it comes to building a multi-page application. It serves as the purpose of having a general arrangement of design or as a ground plan for the program. A master blueprint must be sketched during the planning phase according to the System Development Life Cycle (SDLC). Thus, the team of developers is able to have a clear vision of how their system will look like during the end of developing the product, and how its behavior and where the function can be implemented.

Appendix E shows a master blueprint of design for the system. During the development & implementation phase, this blueprint serves as a guideline throughout the progress of developing this system. The page is broken down into 3 sections which are the header, body & footer. The header consists of a home button, login/logout button, registering an account button, managing account button, back button & to proceed to more function button for specific user type. The footer has the about button & suggestion button. The body is the section that will be displaying all the content requested by the user in grid & list view. It is believed that this combination is much more effective & organized when it comes to user-friendly convenience.

To view the user guide, it is written under section user manual, page 88 - 134.

To see the diagram, it is located under section appendices, page 155.

4.6 Sample Design

Appendix F1 - F2 : Paper Prototype Flow

A sample design is the framework when it comes to sketching out a sample outline of this system's behavior. This allows the developers to plan on the modeling of system structure or the flow between components in the system. As this will help when it comes to building the Entity-Relationship Diagram because it is clearer for the developers to understand how each entity is connected to each other. Apart from that, this could serve as a purpose to help the developers to understand the system behavior more and what could be done to improve the overall functionality and the flow of the whole system.

Appendix F1 – F2 shows the paper prototype flow during the early stages of development, which is the planning phase. The reason behind using a paper prototyping is because it is much more cost efficient when it comes to the cost of developing and less time consuming as paper prototyping is flexible and easy to make adjustment to it.

To read more about the process of this system development, it is written under section 3.2, page 37 - 39.

To see the diagram, it is located under section appendices, page 156 - 157.

CHAPTER 5 : IMPLEMENTATION

5.1 Front End Code

With the use of ASP.NET web applications, ASPX pages are created that contain the user interface and static information. For example, headers and logo. ASPX is basically HTML with additional support for dynamic controls with support for server side control.

5.1.1 Header

There are 3 groups of elements. The 1st group contains buttons including a back button that will serve to redirect users to particular pages. Another group contains the logo which will also serve to redirect users back to the home page. The last group contains elements related to logging in: link to login in, button to register account and a label to display login in user's name.

To manage these 3 groups, the groups are each placed in one cell of a 1 row, 3 column table. The first column is text aligned left , the middle column is text aligned centre and the right column is text aligned right. Breaks and non-breaking spaces are used to space out elements within a cell.

This style of header is used on all our pages.

```

12 <!-- Header -->
13 <div style="background-color: white; font-family: Arial, Helvetica, sans-serif;">
14   <table style="width:100%;">
15     <tr>
16       <td style="width:25%; ">
17         <br />
18         &nbsp;&nbsp;&nbsp;
19         <asp:Button ID="OwnerPortalButton" runat="server" Text="Go to Owner Portal" />
20         <asp:Button ID="AdminPortalButton" runat="server" Text="Go to Admin Portal" /> &nbsp;<br />
21         <br />
22     </td>
23     <td style=" width:50%; text-align: center;">
24       <asp:ImageButton ID="HeaderImageButton" runat="server" ImageUrl="~/NewLogoJPG.jpg" Width="33%" />
25     </td>
26     <td style="width:25%; text-align:right;">
27       <asp:Label ID="HeaderWelcomeLabel" runat="server" Text="Welcome"></asp:Label>
28       <asp:Label ID="UserTypeLabel" runat="server" Visible="False"></asp:Label>
29       &nbsp;&nbsp;&nbsp;
30       <br />
31       <br />
32       <asp:LoginStatus ID="LoginStatus" runat="server" />
33       &nbsp;&nbsp;&nbsp;
34       <asp:Label ID="HeaderOrLabel" runat="server" Text="or"></asp:Label> &nbsp;&nbsp;&nbsp;
35       <asp:Button ID="HeaderRegisterButton" runat="server" Text="Register"></asp:Button>&nbsp;&nbsp;&nbsp;
36     </td>
37   </tr>
38   <hr />
39 </div>
40 <!-- end of header -->
41

```

Figure 5.1.1.1 Header ASPX code



Figure 5.1.1.2 Header rendered

5.1.2 Footer

There are 2 groups of elements. The 1st group contains a button that will serve to redirect users to our suggestion page and a description to explain the button use. The 2nd group contains another button that will serve to redirect users to our about page and too has a description to explain that button use.

To manage these 2 groups, the groups are each placed in one cell of a 1 row, 2 column table. Both columns are text aligned centrally. Breaks and non-breaking spaces are used to space out elements within a cell.

This style of footer is used on all our pages with the exception when showing the first group of elements is not appropriate such as on the suggestion page.

```

129 |     <!-- Footer -->
130 |     <div style="background-color: white; font-family: Arial, Helvetica, sans-serif;">
131 |         <hr />
132 |         <table style="width:100%">
133 |             <tr>
134 |                 <td style="width:50%; text-align: center;">
135 |                     Improve Kopitiam Management System Pro by suggesting.
136 |                     <br />
137 |                     <br />
138 |                     <asp:Button ID="SuggestButton" runat="server" Text="Click here to suggest"></asp:Button>
139 |                     <br />
140 |                     <br />
141 |                 </td>
142 |                 <td style="width:50%; text-align: center;">
143 |                     Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia
144 |                     <br />
145 |                     <br />
146 |                     <asp:Button ID="MoreButton" runat="server"
147 |                         Text="Click here to learn more about Kopitiam Management System Pro"></asp:Button>
148 |                     <br />
149 |                     <br />
150 |                 </td>
151 |             </tr>
152 |         </table>
153 |     </div>
154 |     <!-- End of footer -->

```

Figure 5.1.2.1 Footer ASPX code

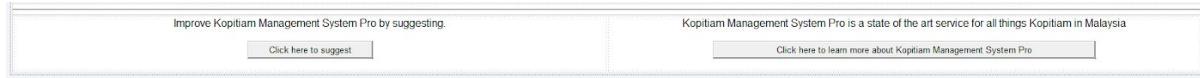


Figure 5.1.2.2 Footer rendered

5.1.3 GridView

There are many ways to display data from a database. GridViews was the primary choice and method used to display data in this Kopitiam Management System. Furthermore, there are different ways to use a GridView.

In all applications, the gridview has its AutoGenerateColumns property set to false which allows for greater control over how data is displayed. Then the OnRowDataBound allows for special things to happen when data is being bound. For example, the conversion of binary data into an image. The OnRowCommand property allows for buttons to be integrated into a GridView. AllowPaging, OnPageIndexChanging and PageSize are all related to setting a maximum number of items that can be displayed in a GridView at a given time.

If there is a need to display more than text, TemplateFields can be used. Buttons or images for example can be nested underneath an ItemTemplate which itself will be nested underneath a TemplateField.

```

100
101 <asp:GridView ID="mainGridView" runat="server" AutoGenerateColumns="false" OnRowDataBound="OnRowDataBound"
102     OnRowCommand="mainGridView_RowCommand" Width="90%" AllowPaging="true" OnPageIndexChanging="OnPageIndexChanging"
103     PageSize="10">
104     <Columns>
105         <asp:BoundField DataField="Id" HeaderText="Our Kopitiam ID" />
106         <asp:TemplateField HeaderText="Image">
107             <ItemTemplate>
108                 <asp:Image ID="imageData" runat="server" style="height:250px; width:250px" />
109             </ItemTemplate>
110         </asp:TemplateField>
111         <asp:BoundField DataField="Name" HeaderText="Kopitiam Name" />
112         <asp:BoundField DataField="Address" HeaderText="Kopitiam Address" />
113         <asp:BoundField DataField="OpHourSt" HeaderText="Kopitiam Opening Hour" />
114         <asp:BoundField DataField="OpHourEn" HeaderText="Kopitiam Closing Hour" />
115         <asp:BoundField DataField="OpDayOfWeek" HeaderText="Kopitiam Opening Days" />
116
117         <asp:TemplateField HeaderText="To know more about a kopitiam, click select">
118             <ItemTemplate>
119                 <asp:Button Text="Select" runat="server" CommandName="Select"
120                     CommandArgument="<%# Container.DataItemIndex %>" />
121             </ItemTemplate>
122         </asp:TemplateField>
123
124
125     </Columns>
126 </asp:GridView>

```

Figure 5.1.3.1 GridView ASPX code

Our Kopitiam ID	Image	Kopitiam Name	Kopitiam Address	Kopitiam Opening Hour	Kopitiam Closing Hour	Kopitiam Opening Days	To know more about a kopitiam, click select
Databound		Databound	Databound	Databound	Databound	Databound	<input type="button" value="Select"/>

Figure 5.1.3.2 An example of a GridView rendered

AddFood	✓	MakeGeneralUserAdmin	✓	ReviewKopitiamSuggestions	✓
AdminPortal	✗	ManageAccount	✓	ReviewStallSuggestions	✓
DeleteReview	✓	ManageKopitiam	✓	SendPostCard	✓
Home	✓	ManageStall	v	Stall	✓
Kopitiam	✓	Register	✗	Suggestion	✗
Login	✗	ReviewGeneralSuggestions	✓	VerifyCode	✗

Figure 5.1.3.3 Where GridView does and does not appear in this project

5.2 Back End Code

With the use of ASP.NET, Visual Basic as the language of choice. Visual Basic for .NET framework is called VB.Net and supplementary is ADO.Net which is used particularly for manipulating the database.

5.2.1 Page Load

A sub is called every time a page loads. Called Page_Load, there are 5 parts to this sub. The 1st part opens a connection to our database. 2nd part, sets up SQL commands that other functions and sub will use on the page. 3rd part alters the headers depending whether the user is logged in or not. the 4th part passes the Id of the current user and calls FindNameOfLoginInUser sub (refer to 5.3.4). The last part deals with IsPostBack where PreveURL is set only when the page loads and not when a user action with an element causes the page to post.back.

This sub is used on all the pages but with additional lines of code depending on the page and it's features.

```
16  References
17  Protected Sub Page_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
18      'When the form loads, first open the connection to the database
19      Dim connStr As String =
20          "Data Source=(LocalDB)\MSSQLLocalDB;AttachDbFilename=|DataDirectory|UDW_Dat.mdf;Integrated Security=True"
21      conn = New SqlConnection(connStr)
22      conn.Open()
23
24      ' Set up the SqlCommand to retrieve username
25      Dim byUserSql As String = "SELECT * FROM Users WHERE Id = @i"
26      findName = New SqlCommand(byUserSql, conn)
27
28      'show or hide elements dependings on whether user has login or not.
29      If Not Me.Page.User.Identity.IsAuthenticated Then
30          HeaderRegisterButton.Visible = True
31          HeaderOrLabel.Visible = True
32          HeaderWelcomeLabel.Visible = False
33      Else
34          HeaderRegisterButton.Visible = False
35          HeaderOrLabel.Visible = False
36          HeaderWelcomeLabel.Visible = True
37      End If
38
39      'get the user id from system.
40      Dim Id As String = Me.Page.User.Identity.Name
41      'run sub to find details of login in system.
42      FindNameOfLoginInUser(Id)
43
44      If Not Me.IsPostBack Then
45          PrevURL = Request.UrlReferrer.ToString()
46      End If
47
48  End Sub
```

Figure 5.2.1.1 Page_Load template

An optional 6th part is to check the user type which is obtained from FindNameOfLoginInUser() sub. This sub is used to protect certain pages where some users are allowed to access it but others aren't. For example, admin portal page. If the user trying to access the page is not an admin, the user will get redirected to the home page.

```
39 |     FindNameOfLoginInUser(Id)  
40 |  
41 |     If Not userTypeLabel.Text = "1" Then  
42 |         Response.Redirect("Home.aspx")  
43 |     End If
```

Figure 5.2.1.2 Optional 6th part to Page_Load

5.2.2 Page Unload

A sub is called every time a page unloads. Called Page_Unload, it is called when a page has finished initializing and not when the page is closed. Hence why it is appropriate to close the connection to our database that was during page load.

This sub is used on all the pages.

```
50 |     References  
51 |  
52 |     Private Sub Page_Unload(sender As Object, e As EventArgs) Handles Me.Unload  
53 |         'page is unloading.  
54 |         ' close connection to database.  
55 |         conn.Close()  
56 |     End Sub
```

Figure 5.2.2.1 Page_Unload template

5.2.3 Header and Footer

These 5 subs exist to handle user clicks of the elements that exist in either the header or footer.

When the user clicks on the logo in the center of our header, HeaderImageButton_Click is called which handles HeaderImageButton.Click. The logo element's name is HeaderImageButton and the user gets redirected to the home page.

When the user clicks on the register button on the right side of our header, HeaderRegisterButton_Click is called which handles HeaderRegisterButton.Click. The logo element's name is HeaderRegisterButton and the user gets redirected to the register page.

When the user clicks on the “click here to suggest” button on the left side of the footer, SuggestButton_Click is called which handles SuggestButton.Click. The logo element's name is SuggestButton and the user gets redirected to the suggestion page.

When the user clicks on the “click here to learn more about Kopitiam Management System Pro” button on the right side of the footer, MoreButton_Click is called which handles MoreButton.Click. The logo element's name is MoreButton and the user gets redirected to the about page.

Lastly, when the user clicks on the back button (absent from figure 5.3.3.1) on the left side of the footer, BackButton_Click is called which handles BackButton.Click. The logo element's name is BackButton and the user gets redirected to the previous page they were on.

The 5 subs are used on all the pages.



Figure 5.2.3.1 Header rendered



Figure 5.2.3.2 Footer rendered

```

85  Protected Sub HeaderImageButton_Click(sender As Object, e As ImageClickEventArgs) Handles HeaderImageButton.Click
86      'user click on logo.
87      'redirect user to home, default page.
88      Response.Redirect("Home.aspx")
89  End Sub
90
91  References
92  Protected Sub HeaderRegisterButton_Click(sender As Object, e As EventArgs) Handles HeaderRegisterButton.Click
93      'user click on register button.
94      'redirect user to register page.
95      Response.Redirect("Register.aspx")
96  End Sub
97
98  References
99  Protected Sub SuggestButton_Click(sender As Object, e As EventArgs) Handles SuggestButton.Click
100     'user click on suggest button.
101     'redirect user to suggestion page.
102     Response.Redirect("Suggestion.aspx")
103  End Sub
104
105  References
106  Protected Sub MoreButton_Click(sender As Object, e As EventArgs) Handles MoreButton.Click
107      'user click on learn more button.
108      'redirect user to about page.
109      Response.Redirect("About.aspx")
110  End Sub
111
112  End Class

```

Figure 5.2.3.3 .Click subs

5.2.4 Find Name Of Login In User

The web application is set up so that after a user has signed in, their user ID is accessible on every page. This user ID can be taken and used for many things including finding their name. `FindNameOfLoginInUser(Id)` takes the Id obtained from page load and put it inside an SQL command that finds the details of the logged in user based on the Id. With the name retrieved, attach it after “welcome” and put it in the header resulting in “welcome [user’s name]”.

This sub is used on all pages and can be adapted to find other details of that user including the user type which is a must for pages that are only meant to be accessed by a selected number of users.

```

1 reference
57  Public Sub FindNameOfLoginInUser(Id)
58      Dim name As String
59
60      ' To retrieve information about the log in user, we need to set the @i parameter in
61      ' findName with the id from system.
62      findName.Parameters.Clear()
63      findName.Parameters.AddWithValue("i", Id)
64
65      ' Then run findName. The SqlDataAdapter will put the query results inside a DataSet with the
66      ' label "byCat"
67      Dim adapter As SqlDataAdapter = New SqlDataAdapter(findName)
68      Dim ds As DataSet = New DataSet()
69      adapter.Fill(ds, "byCat")
70
71      ' Now the query results are inside a DataTable called "byCat" inside ds
72      Dim dt As DataTable = ds.Tables("byCat")
73
74      ' Check whether dt has any rows inside it? If dt.Rows.Count = 0 that means 0 rows, i.e. no data found!
75      If Not (dt.Rows.Count = 0) Then
76          ' otherwise = there are really some data!
77          Dim dr As DataRow = dt.Rows(0)
78          ' get the value in the "name" column for display in the header
79          name = dr("name")
80          ' set the welcome label with the just retrieved name
81          HeaderWelcomeLabel.Text = "Welcome " + name
82      End If
83  End Sub

```

Figure 5.2.4.1 FindNameOfLoginInUser() sub template

5.2.5 Encryption

In the event of a database being leaked or hacked, access to confidential data will be relatively easy if stored in plain text. Hence why encryption is used to encrypt confidential data such as email addresses and passwords after a user has inputted them but before they are stored on our database.

The method of encryption used is a form of AES encryption algorithm with a Symmetric key. Symmetric means the same. The user's input is converted into bytes. A key is generated with the bytes and set key. A byte array is the first output of encryption but is quickly converted to Base64String which can then be inserted into the database.

```

60  Private Function Encrypt(clearText As String) As String
61      Dim EncryptionKey As String = "MAKV2SPBNI99212"
62      Dim clearBytes As Byte() = Encoding.Unicode.GetBytes(clearText)
63      Using encryptor As Aes = Aes.Create()
64          Dim pdb As New Rfc2898DeriveBytes(EncryptionKey, New Byte() {&H49, &H76, &H61, &H6E, &H20, &H4D,
65              &H65, &H64, &H76, &H65, &H64, &H65,
66              &H76})
67              encryptor.Key = pdb.GetBytes(32)
68              encryptor.IV = pdb.GetBytes(16)
69              Using ms As New MemoryStream()
70                  Using cs As New CryptoStream(ms, encryptor.CreateEncryptor(), CryptoStreamMode.Write)
71                      cs.Write(clearBytes, 0, clearBytes.Length)
72                      cs.Close()
73                  End Using
74                  clearText = Convert.ToBase64String(ms.ToArray())
75              End Using
76          End Using
77      Return clearText
78  End Function

```

Figure 5.2.5.1 Encrypt() sub template

AddFood	✗	MakeGeneralUserAdmin	✗	ReviewKopitiamSuggestions	✗
AdminPortal	✗	ManageAccount	✓	ReviewStallSuggestions	✗
DeleteReview	✗	ManageKopitiam	✗	SendPostCard	✗
Home	✗	ManageStall	✗	Stall	✗
Kopitiam	✗	Register	✓	Suggestion	✗
Login	✓	ReviewGeneralSuggestions	✗	VerifyCode	✗

Figure 5.2.5.2 Where Encrypt() does and does not appear in this project

5.2.6 Decryption

Encrypted text is good but useless if never decrypted at some point. After all, there is no point of storing data if it is never to be used. Decryption is very much the reversal of encryption with similarities. The encrypted text that is needed to be decrypted is firstly converted into bytes where a key is produced. The decryption then occurs and a byte array is the first output of decryption but is quickly converted to Base64String which can then be displayed to the user.

```

124     Private Function Decrypt(cipherText As String) As String
125         Dim EncryptionKey As String = "MAKV2SPBNI99212"
126         Dim cipherBytes As Byte() = Convert.FromBase64String(cipherText)
127         Using encryptor As Aes = Aes.Create()
128             Dim pdb As New Rfc2898DeriveBytes(EncryptionKey, New Byte() {&H49, &H76, &H61, &H6E, &H20, &H4D,
129             &H65, &H64, &H76, &H65, &H64, &H65,
130             &H76})
131             encryptor.Key = pdb.GetBytes(32)
132             encryptor.IV = pdb.GetBytes(16)
133             Using ms As New MemoryStream()
134                 Using cs As New CryptoStream(ms, encryptor.CreateDecryptor(), CryptoStreamMode.Write)
135                     cs.Write(cipherBytes, 0, cipherBytes.Length)
136                     cs.Close()
137                 End Using
138                 cipherText = Encoding.Unicode.GetString(ms.ToArray())
139             End Using
140         End Using
141         Return cipherText
142     End Function

```

Figure 5.2.6.1 Decrypt() sub template

AddFood	✓	MakeGeneralUserAdmin	✗	ReviewKopitiamSuggestions	✓
AdminPortal	✗	ManageAccount	✓	ReviewStallSuggestions	✓
DeleteReview	✗	ManageKopitiam	✗	SendPostCard	✓
Home	✗	ManageStall	✗	Stall	✗
Kopitiam	✗	Register	✗	Suggestion	✗
Login	✓	ReviewGeneralSuggestions	✓	VerifyCode	✗

Figure 5.2.6.2 Where Decrypt() does and does not appear in this project

5.2.7 Bind Grid and Selecting

As mentioned in 5.1.3, GridViews are used primarily in this project to display data from the database. This is further accomplished by a BindGrid sub and a SELECT sql query. The BindGrid() sub essentially executes a SELECT sql query and tells the GridView that it's data source is the data obtained from executing the query. A SELECT sql query can get more complex when needed to obtain data from multiple tables, when calculating average or summing up.

```

46      |      |      'Set up the SqlCommand to retrieve pictures
47      |      |      Dim byPicSql As String = "SELECT Id, mainImageData, Name, Address, OpHourSt, OpHourEn, OpDayOfWeek FROM Kopitiam"
48      |      |      findPictures = New SqlCommand(byPicSql, conn)

```

Figure 5.2.7.1 SELECT sql query

```

187  Private Sub BindGrid()
188      |      |      Dim openConn As Boolean = (conn.State = ConnectionState.Open)
189      |      |      If (openConn = False) Then
190          |      |          conn.Open()
191      |      End If
192
193      |      |      ' Then run byCategoryCmd. The SqlDataAdapter will put the query results inside a DataSet with the label "byCat"
194      |      |      Dim adapter2 As SqlDataAdapter = New SqlDataAdapter(findPictures)
195      |      |      Dim ds2 As DataSet = New DataSet()
196      |      |      adapter2.Fill(ds2, "byCat")
197
198      |      |      ' Now the query results are inside a DataTable called "byCat" inside ds
199      |      |      Dim dt2 As DataTable = ds2.Tables("byCat")
200
201      |      |      ' Check whether dt has any rows inside it? If dt.Rows.Count = 0 that means 0 rows, i.e. no data found!
202      |      |      If (dt2.Rows.Count = 0) Then
203
204          |      |          mainGridView.DataSource = Nothing
205          |      |          mainGridView.DataBind()
206
207          |      |          statusLabel.Visible = True
208
209      |      Else ' otherwise = there are really some rows of data in the result!
210          |      |          ' Assume that each user id is unique, so if results available,
211          |      |          ' should be exactly ONE row. Take the first row in the table.
212          |      |          Dim dr2 As DataRow = dt2.Rows(0)
213          |      |          mainGridView.DataSource = dt2
214          |      |          mainGridView.DataBind()
215
216      |      End If
217
218      |      conn.Close()
219  End Sub
220
221

```

Figure 5.2.7.2 BindGrid() example

AddFood	✓	MakeGeneralUserAdmin	✓	ReviewKopitiamSuggestions	✓
AdminPortal	✗	ManageAccount	✓	ReviewStallSuggestions	✓
DeleteReview	✓	ManageKopitiam	✓	SendPostCard	✓
Home	✓	ManageStall	v	Stall	✓
Kopitiam	✓	Register	✗	Suggestion	✗
Login	✗	ReviewGeneralSuggestions	✓	VerifyCode	✗

✓ *Figure 5.2.7.3 Where bind grid does and does not appear in this project*

5.2.8 Insertion

A management system no matter how great it is, is completely useless without any data to manage. Hence why data must be inserted but where does the data come from? Depending on the page, data either comes from user input or from the database itself. In the latter example, we are taking data from one table and inserting into another table.

```
43     'Set up the SqlCommand to add general suggestion table
44     Dim addGenSql As String = "INSERT INTO GeneralSuggestion(UserId, Comment, Date, Status) VALUES (@n, @c, @t, @s)"
45     addGeneralSuggestion = New SqlCommand(addGenSql, conn)
```

Figure 5.2.8.1 Setting up SQL statement for inserting

As seen in figure 5.2.8.1, data will be inserted into a table called GeneralSuggestion. The data that will be inserted is: UserId, Comment, Date and Status. To prevent SQL injection, a method of attack against databases, we assign the data to be inserted with values. In this example: n, c, t and s.

```
147     Public Sub GeneralSuggestion()
148
149         conn.Open()
150
151         Dim status As String = "Unread"
152
153         Dim userId As Integer = Me.Page.User.Identity.Name
154         Dim comment As String = suggestionPageGeneralTextBox.Text
155         Dim todayDate As String = Format(Now, "dd-MM-yyyy")
156
157         'set the parameter values in addBookCmd
158         addGeneralSuggestion.Parameters.Clear()
159         addGeneralSuggestion.Parameters.AddWithValue("n", userId)
160         addGeneralSuggestion.Parameters.AddWithValue("c", comment)
161         addGeneralSuggestion.Parameters.AddWithValue("t", todayDate)
162         addGeneralSuggestion.Parameters.AddWithValue("s", status)
163
164         'Execute the command
165         Dim rowsAffected As Integer = addGeneralSuggestion.ExecuteNonQuery()
166
167         Try
168             'If more than zero rows affected , insertion was successful !
169             If rowsAffected > 0 Then
170                 suggestionPageErrorLabel.ForeColor = Color.Green
171                 suggestionPageErrorLabel.Text = "Success! Suggestion has been suggested."
172
173                 ClearTextBoxes()
174
175             End If
176             Catch exError As Exception
177                 suggestionPageErrorLabel.ForeColor = Color.Red
178                 suggestionPageErrorLabel.Text = "There was a problem with submitting your suggestion."
179             End Try
180
181             conn.Close()
182
183         End Sub
```

Figure 5.2.8.2 Inserting sub example

Then as shown in figure 5.2.8.2, the data is first procured. Status is set as unread. The UserId is obtained from a name associated with the identity of the current user login in. The Date is obtained from the system date and formatted so that all dates in the database stay consistent. Lastly, the comment is taken from the user's input which is in this example is located in a textbox with the ID suggestionPageGeneralTextBox. Lastly, the command is executed.

AddFood	✓	MakeGeneralUserAdmin	✗	ReviewKopitiamSuggestions	✓
AdminPortal	✗	ManageAccount	✗	ReviewStallSuggestions	✓
DeleteReview	✗	ManageKopitiam	✗	SendPostCard	✗
Home	✗	ManageStall	✗	Stall	✓
Kopitiam	✓	Register	✓	Suggestion	✓
Login	✗	ReviewGeneralSuggestions	✗	VerifyCode	✗

Figure 5.2.8.3 Where insertion does and does not appear in this project

5.2.9 Updating

It is expected that over time, things change. With a system like Kopitiam Management System Pro, it is important to update the database when necessary to continue to share up to date and relevant information.

```
37      ' Set up the SqlCommand to update a user type
38      Dim updateRecipeSql As String = "UPDATE Users SET UserType = @t WHERE Id = @i"
39      updateUser = New SqlCommand(updateRecipeSql, conn)
```

Figure 5.2.9.1 Setting up SQL statement for updating

As seen in figure 5.2.9.1, we are going to update a table called Users which includes data such as UserType and Id. The UserType associated with the Id can be updated.

```
128  Protected Sub OnRowUpdating(sender As Object, e As GridViewUpdateEventArgs)
129
130      Dim row As GridViewRow = usersGridView.Rows(e.RowIndex)
131      Dim userId As Integer = Convert.ToInt32(usersGridView.DataKeys(e.RowIndex).Values(0))
132      Dim UtypeDDL As DropDownList = TryCast(row.FindControl("UserTypeDropDownList"), DropDownList)
133      Dim userType As Integer = UtypeDDL.SelectedValue
134      statusLabel.Text = userType
135
136      If userType > 0 Then
137          ' Set the parameter values
138          updateUser.Parameters.Clear()
139          updateUser.Parameters.AddWithValue("t", userType)
140          updateUser.Parameters.AddWithValue("i", userId)
141
142          ' Execute!
143          Dim rowsAffected As Integer = updateUser.ExecuteNonQuery()
144          ' If more than 0 rows affected, update was successful
145          If rowsAffected > 0 Then
146              statusLabel.Text = "Update successful"
147          Else
148              statusLabel.Text = "Update not succesful"
149          End If
150          usersGridView.EditIndex = -1
151          Me.BindGrid()
152
153      Else
154          statusLabel.Text = "user type entered is invalid" & "UT:" & userType
155      End If
156
157  End Sub
```

Figure 5.2.9.2 Inserting sub example

Then as shown in figure 5.2.9.2, the data is first procured. Status is set as unread. The UserId is obtained from a name associated with the identity of the current user login in. The Date is obtained from the system date and formatted so that all dates in the database stay

consistent. Lastly, the comment is taken from the user's input which is in this example is located in a textbox with the ID suggestionPageGeneralTextBox. Lastly, the command is executed.

AddFood	✓	MakeGeneralUserAdmin	✓	ReviewKopitiamSuggestions	✓
AdminPortal	✗	ManageAccount	✓	ReviewStallSuggestions	✓
DeleteReview	✗	ManageKopitiam	✓	SendPostCard	✓
Home	✗	ManageStall	✓	Stall	✗
Kopitiam	✓	Register	✗	Suggestion	✗
Login	✗	ReviewGeneralSuggestions	✓	VerifyCode	✓

Figure 5.2.9.3 Where updating does and does not appear in this project

5.2.10 Image Processing

The main purpose this system implements in the project is to filter the irrelevant images uploaded to the server and occupy too much space in the database. It will act as the first line of filter that once a user uploads an image, it will send it to the server via temporary storage or Random Access Memory (RAM) to perform filter and analysis. Once accepted it will prompt success to users and save it into the database. If rejected, the image will be discarded from temporary storage.

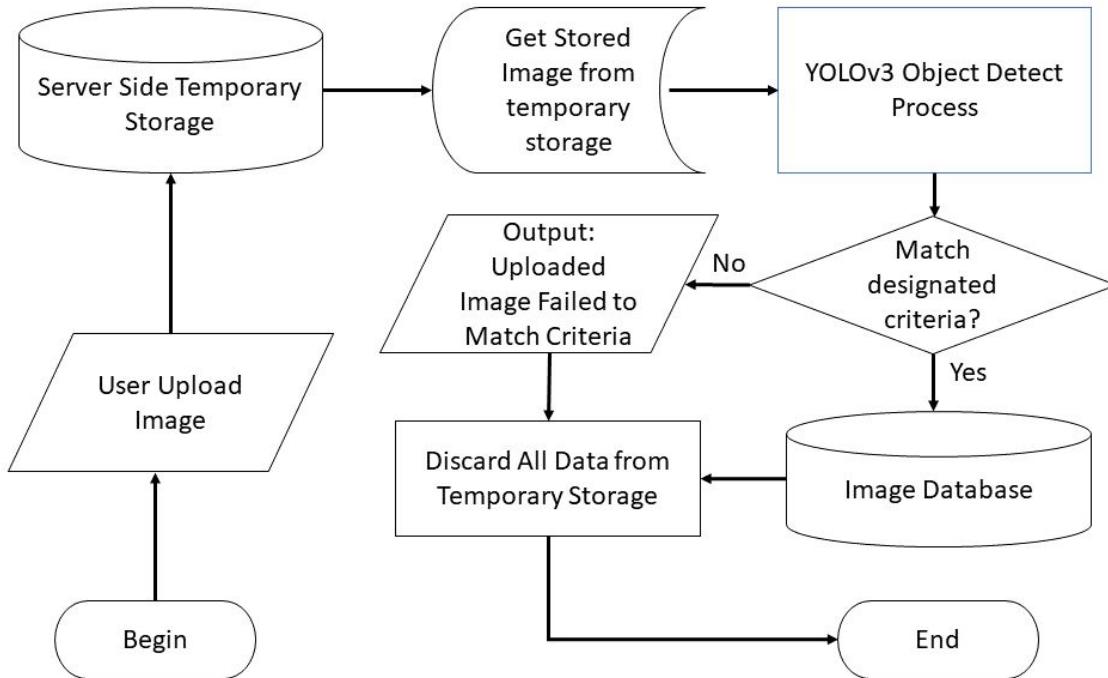


Figure 5.2.10.1: Flow Chart of implementing YOLO model in project

In the code, the system will act as a function that is for checking and validating the picture uploaded by the user. So that it will return values to the caller to do further actions. The explanation of the source code function will be shown below:

At the beginning of the function, there will be many variable initialization which is mostly the get and set paths to the server and the image file names.

```

Dim cD = New Alturos.Yolo.ConfigurationDetector
Dim config = cD.Detect(detectorPath)
Dim wrapper = New YoloWrapper(config)
  
```

Figure 5.2.10.2: Source code for configure the YOLO detector

Before using the function, it first needs to install and import the YOLO class into the project. The configurator will auto detect the file needed from the path provided. So that the wrapper will wrap all content and be ready to detect. The configurator mainly detect three files which is format of '.cfg' - YOLO Configuration File, '.WEIGHT' - The main component of YOLO which consist the neural network pre-trained previously and '.name' file which contain a list of object types provided from training.

```

'Set image into grey scale
Dim Img As Bitmap = New Bitmap(imagePath)
Dim gsImg As Bitmap = New Bitmap(Img.Width, Img.Height, System.Drawing.Imaging.PixelFormat.Format32bppArgb)
'Set indexed image into non indexed image
Dim tempGraf As Graphics = Graphics.FromImage(CType(gsImg, Image))
tempGraf.DrawImage(Img, 0, 0)
tempGraf.Dispose()
Img.Dispose()

For y As Integer = 0 To gsImg.Height - 1
    For x As Integer = 0 To gsImg.Width - 1
        Dim c As Color = gsImg.GetPixel(x, y)
        Dim r As Integer = c.R
        Dim g As Integer = c.G
        Dim b As Integer = c.B
        Dim avg As Integer = (r + g + b) / 3
        gsImg.SetPixel(x, y, Color.FromArgb(avg, avg, avg))
    Next
Next

```

Figure 5.2.10.3: Source code of converting image into grayscale.

From some research, some object detection works best at greyscales, so that by converting the uploaded images into grayscale, the result will be in better accuracy. However, for some object which has an unobvious form, coloured images will be able to help to be detected. So that the whole function will have an object detection process running twice.

```

Using (wrapper)
    Dim item = wrapper.Detect(imgPath)
    GridView1.DataSource = item
    GridView1.DataBind()
End Using

```

Figure 5.2.10.4: Source code for object detection process

After all configuration is set, the detection is ready to detect the image from the designated file path. The class will return a table that represents the results from the detection process. Also, the configurations can be reused without reinitializing them again. The example results will be below (Right) from image detected (Left) the result was retrieve from 2 detection process which is coloured and grayscale :



Type	Confidence	X	Y	Width	Height
Food	0.668069779872894	553	114	219	211
Plate	0.320661246776581	528	129	265	210
Plate	0.264845013618469	184	289	394	363
Plate	0.914990425109863	599	412	412	330

Figure 5.2.10.5: Sample result returned after detection process.

After the detection process, the result will be shown on the table which has eliminated redundant data. The table provides the type of object, confidence which is the “Score” given that matches the neural network data, X and Y coordinates of the center point of the detected object and the width and height of the detected object.

```

For Each row In ObjectDetectedGridView.Rows
    resultObjects = resultObjects & row.Cells(0).text & " "
    If row.Cells(0).text = "Billboard" Then
        'Get rectangle Data
        Dim bbWidth As Integer = Integer.Parse(row.Cells(4).text)
        Dim bbHeight As Integer = Integer.Parse(row.Cells(5).text)
        Dim rectX As Integer = Integer.Parse(row.Cells(2).text)
        Dim rectY As Integer = Integer.Parse(row.Cells(3).text)
        Dim rect As Rectangle = New Rectangle(rectX, rectY, bbWidth, bbHeight)
        Dim image As Bitmap = Bitmap.FromFile(greyScaledImgFilePath)
        'Draw a bitmap according to rectangle size
        Dim cropImage = New Bitmap(bbWidth, bbHeight)
        Using grp = Graphics.FromImage(cropImage)
            grp.DrawImage(image, New Rectangle(0, 0, rect.Width, rect.Height), rect, GraphicsUnit.Pixel)
        End Using
        Dim cropFn As String = "Crop_Billboard" & row.cells(2).text & ".jpg"
        Dim cropPath As String = Path.Combine(Server.MapPath("~/Images/"), cropFn)
    End If
Next

```

Figure 5.2.10.6: Source code of crop image

The next process will be letting the OCR to validate the billboard. So that it makes things easier, the system will crop out the Billboard from the image user uploaded and according to the result provided from YOLO object detection.

Kopitiam Management System Pro implementation of image processing including optical character recognition known also as OCR checks if the image the user is uploading has a

billboard and if the billboard contains relevant words like “Kedai” or “Kopitiam”. The user will be altered if the systems in place identifies the image to not meet the set requirements.

```
---  
384     'OCR  
385     Using api As OcrApi = OcrApi.Create()  
386         api.Init(Languages.English)  
387         Dim plainText As String = api.GetTextFromImage(cropPath)  
388  
389         Try  
390             plainText = api.GetTextFromImage(cropPath)  
391         Catch NoLicenseException As Patagames.Ocr.Exceptions.NoLicenseException  
392             suggestionPageErrorLabel0.Text = "exception handled "  
393         End Try  
394  
395         If plainText = "" Then  
396             suggestionPageErrorLabel0.Text = "nothing found"  
397         Else  
398             suggestionPageErrorLabel0.Text = plainText  
399         End If  
400     End Using  
401  
402
```

Figure 5.2.10.7 Partial source code for using OCR

As evident from the above figure, figure 5.2.10.8, using an OCR API, we initialize it by stating a language. In this case, English. Then it takes the crop image and attempts to recognise characters optically. Try and catch in place to handle exceptions in case anything goes wrong with running the OCR.

```
If resultObjects.Contains("Table") AndAlso resultObjects.Contains("Chair")  
    Return "VALID"  
ElseIf (resultObjects.Contains("Table") Or resultObjects.Contains("Chair"))  
    Return "WARNING"  
Else Return "INVALID"  
End If
```

Figure 5.2.10.8: Partial source code of function return value

Finally the function will meet the end and start to compare and return the value to the caller. There will be three criteria to be returned which is “VALID” - Image fully meet criteria, “WARNING” - Image partially meet criteria and “INVALID” - Image does not meet criteria. For the caller, it will continue taking actions using the result returned from the function.

However, although the system is fully trained the accuracy is still not fully functional which the reasons may be many. The main reason is the dataset for training is not enough. The model only uses about 300 images for training and due to the time taken will be exponentially increased as the dataset number increases. Also Google Colabotory only allows 12 hours per

session (Colab Pro, n.d.) which need to do backups and retrain for the model. So, during the stop time, the connection inside the neural network will be not accurate and might be disconnected.

To pursue the best accuracy and better model design, the only process is to retrain the model. It is better not to be continued or added more classes for the best accuracy and better performances. So the model in this system is just the demo version which did not fully train and insufficient dataset. For the better version the model will take a significant amount of time to train and will take more storage on disk.

AddFood	✗	MakeGeneralUserAdmin	✗	ReviewKopitiamSuggestions	✗
AdminPortal	✗	ManageAccount	✗	ReviewStallSuggestions	✗
DeleteReview	✗	ManageKopitiam	✓	SendPostCard	✗
Home	✗	ManageStall	✓	Stall	✓
Kopitiam	✓	Register	✗	Suggestion	✓
Login	✗	ReviewGeneralSuggestions	✗	VerifyCode	✗

Figure 5.2.10.9 Where image processing does and does not appear in this project

5.3 Hosting

As Kopitiam Management System Pro is a web application, there is no installation to speak off. For users, there is no downloading a .exe application or apk file to access our project. Rather developers do the hard work by hosting the project to allow for users to easily access our project through a web browser without any prior installation.

5.3.1. Local Hosting

IIS Express can be used to host Kopitiam Management System Pro locally. It comes bundled with Visual Studio and does not require any other additional setup procedures. Its integration with Visual Studio goes further as developers will only need to click on one button to launch IIS Express and to host the project locally. Upon clicking this button, a local server is launched and a web browser opens with the URL containing “localhost”.



Figure 5.3.1.1 Button to activate IIS Express at the top of Visual Studio

5.3.2 Azure Hosting

Kopitiam Management System Pro can also be hosted on a web server which will allow for people to access it anywhere by entering a designated domain into a web browser. The domain will contain “.azurewebsites.net”. There are multiple ways to host an ASP.NET web application however the recommended method is with Azure hosting. It requires a lot of steps and is not free. However there is a 30-day trial. Once concluded, billing is based on usage.

To get started, an Azure account must be created at <https://azure.microsoft.com/>. Afterwards, the database must be recreated there as hosting on Azure does not support “LocalDB” which is the method used for hosting the database when hosting Kopitiam Management System Pro locally.

The screenshot shows the Microsoft Azure portal interface for managing SQL databases. The main title bar says "Microsoft Azure" and "Search resources, services, and docs (G+)" with a user icon. The URL bar shows "0200827@student.kduup... kdu university college (pg)..."

The left sidebar navigation includes "Home > SQL databases > SQL databases" under "KDU University College (PG) Sdn Bhd". Other options like "+ Add", "Reservations", and "Feedback" are also visible.

The main content area is titled "UDW_Dat (udw/UDW_Dat) ✎" and is identified as an "SQL database". It shows the following details:

- Resource group (change):** UDW20200629210804ResourceGroup
- Status:** Online
- Location:** East US
- Subscription (change):** Evaluación gratuita
- Subscription ID:** a531a790-0622-49de-9233-7ef1bb42221d
- Tags (change):** Click here to add tags
- Server name:** udw.database.windows.net
- Elastic pool:** No elastic pool
- Connection strings:** Show database connection strings
- Pricing tier:** Basic
- Earliest restore point:** 2020-08-03 00:00 UTC

Below these details is a "Compute utilization" chart showing usage over time (1 hour, 24 hours, 7 days). The chart has four data series: CPU percentage (Avg), CPU percentage (Max), Memory usage (Avg), and Memory usage (Max).

On the right side, there are sections for "Database data storage" (Used space: 9 MB, Allocated space: 9 MB, Maximum storage size: 2 GB, 0.44% USED SPACE), "Notifications (0)", and "Database features (6)". Under "Database features", two items are listed: "Transparent data encryption" (Status: CONFIGURED) and "Advanced data security" (Status: NOT CONFIGURED).

Figure 5.3.2.1 Azure SQL database manager user interface

A new connection string will be generated which can replace the LocalDB connection string within the software code in Visual Studio. There, a dialog can be opened to reveal the many other options of not local hosting. With this dialog, selecting Azure then next and filling in required details is all it takes for Kopitiam Management System Pro to be hosted not locally.

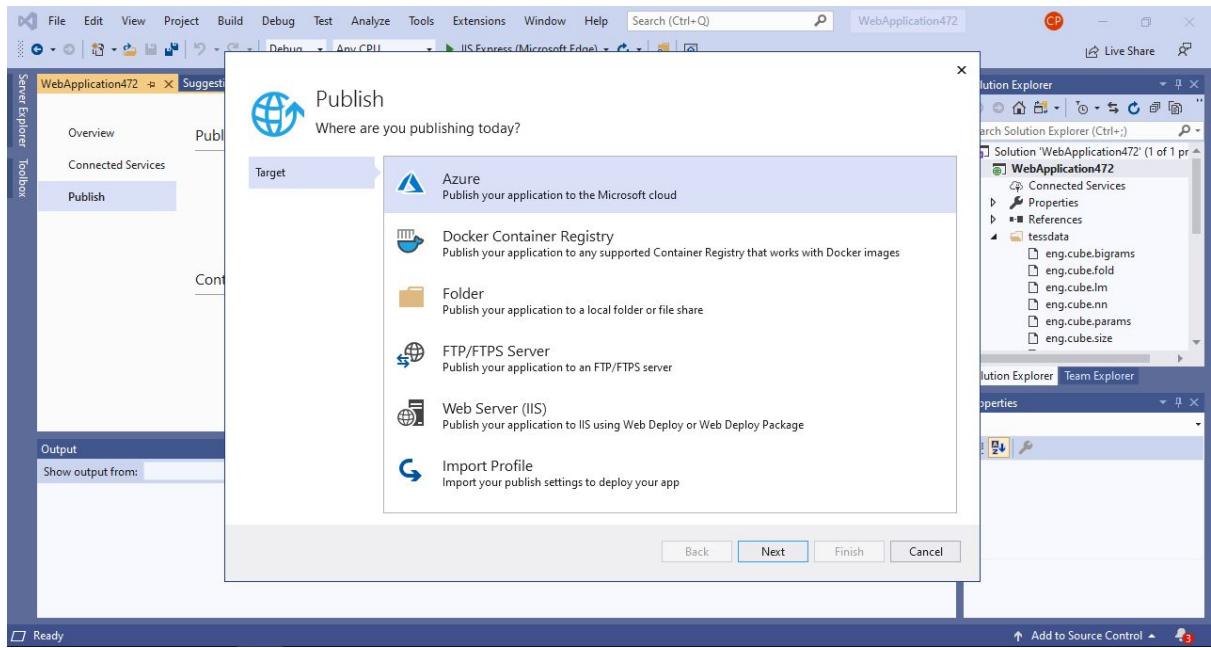


Figure 5.3.2.2 Visual Studio publish options

CHAPTER 6 : TESTING

6.1: Blackbox Testing

1. Login - Email Input

Input Condition	Valid Equivalence Class	Valid Boundaries	Invalid Equivalence Class	Invalid Boundaries
EMAIL				
type	Varchar (1)		Non-varchar (4)	
size	(2) 1 - 50 (3)		(5) 0 , 51 (6)	

Valid Test Case	Boundaries Covered
abc123@hotmail.com	1, 2
abcdefghijklmнопqrstuvwxyz123456789101@hotmail.com	1, 2, 3

Invalid Test Case	Boundaries Covered
	4, 5
abcdefghijklmнопqrstuvwxyz1234567891011121314151617181920@hotmail.com	6

2. Login - Password Input

Input Condition	Valid Equivalence Class	Valid Boundaries	Invalid Equivalence Class	Invalid Boundaries
PASSWORD				
type	Varchar (1)		Non-varchar (4)	
size	(2) 1 - 50 (3)		(5) 0 , 51 (6)	

Valid Test Case	Boundaries Covered
abc123	1, 2
abcdefghijklmnpqrstuvwxyzABCDEFGHIJKLMN OPQRST1234	1, 2, 3

Invalid Test Case	Boundaries Covered
	4, 5
abcdefghijklmnpqrstuvwxyzABCDEFGHIJKLMN OPQRST1234@#\$	6

3. Review Input

Input Condition	Valid Equivalence Class	Valid Boundaries	Invalid Equivalence Class	Invalid Boundaries
REVIEW				
type	Varchar (1)		Non-varchar (4)	
size	MAX (2)		0 (5)	

Valid Test Case	Boundaries Covered
I love this kopitiam & the stalls plus it opens 24/7!	1, 2

Invalid Test Case	Boundaries Covered
	3, 4

4. Rating Input

Input Condition	Valid Equivalence Class	Valid Boundaries	Invalid Equivalence Class	Invalid Boundaries
RATING				
type	Int(1)		Non-int (4)	
size	(2) 1 - 5 (3)		0 (5)	

Valid Test Case	Boundaries Covered
1 star rating given by user	1, 2
5 stars rating given by user	1, 3

Invalid Test Case	Boundaries Covered
0 star rating given by user / "empty"	4, 5

6.2 Whitebox Texting

1. Check & Response to User For Data Acquisitions

Code Snippet:

Input : rowsAffected
If (rowsAffected > 0) Then BindGrid() Else statusLabel.Text = "There was a problem with deleting your review and ratings" End If

Truth Table:

	rowsAffected > 0
1	True
2	False

Test Cases:

rowsAffected	Entries	Statements
1	1	Function will call to bind the data acquired from the database table and display on Grid View.
0	2	Show error message: "There was a problem with deleting your review and ratings"
-1	2	Show error message: "There was a problem with deleting your review and ratings"

2. Limit Suggestions / User Comment Character Length

Code Snippet:

```
Input : comment.Count

If comment.Count > 5000 Then
    suggestionPageErrorLabel.Text = "Sorry, your suggestion is too long"
Else
    GeneralSuggestion()
End If
```

Truth table:

		comment.Count > 5000
1		True
2		False

Test Cases:

comment.Count	Entries	Statements
4999	1	Proceed to insert data into the database via SQL procedure.
5000	2	Show error message: "Sorry, your suggestion is too long"

3. Check Image Format

Code Snippet:

Input : Extention
If Extention.ToLower = ".jpg" Or Extention.ToLower = ".png" Or Extention.ToLower = ".jpeg" Then Return True Else Return False End If

Truth Table:

	Extention.ToLower
1	True
2	False

Test Cases:

Extention.ToLower	Entries	Statements
.png	1	Return True back to caller to further evaluate
.jpg	1	Return True back to caller to further evaluate
.jpeg	1	Return True back to caller to further evaluate
.gif	2	Return False back to caller to further evaluate

4. Image Detection Return Conditions

Code Snippet:

Input : resultObjects
<pre>If resultObjects.Contains("Table") AndAlso resultObjects.Contains("Chair") AndAlso resultObjects.Contains("Billboard") Then Return "VALID" ElseIf resultObjects.Contains("Table") Or resultObjects.Contains("Chair") Or resultObjects.Contains("Billboard") Then Return "WARNING" Else Return "INVALID" End If</pre>

Truth Table:

	resultObjects.Contains("Table") AndAlso resultObjects.Contains("Chair") AndAlso resultObjects.Contains("Billboard")
1	True
2	False

	resultObjects
3	True
4	False

Test Cases:

resultObjects.Contains	Entries	Statements
“Table, Chair, Billboard”	1	Return VALID represent fully meet criteria
“Table, Chair, Cat”	2, 3	Return WARNING represent partially meet criteria
“Table, Billboard”	2, 3	Return WARNING represent partially meet criteria
“Table”	2, 3	Return WARNING represent partially meet criteria
“Billboard”	2, 3	Return WARNING represent partially meet criteria
“Chair”	2, 3	Return WARNING represent partially meet criteria
“Car, Billboard, Billboard”	2, 3	Return WARNING represent partially meet criteria
“Car, Plate”	4	Return INVALID represent not meeting and criteria given

CHAPTER 7 : CONCLUSIONS & FUTURE RECOMMENDATION

7.1 Summary

This project development was planned and carried out during our 12 weeks of semester which is within our course for our Final Year Project subject. Throughout the whole project development, our team was assisted by our supervisor named Ms Tan Phit Huan. She has helped and supported us endlessly with her time and effort in hoping to help make our project a successful one with quality services and functions. She was more than just a lecturer/supervisor to our team as she was acting as an outsider, stranger or any random user where she will look at our system as a whole and provide us with feedback that what will customers expect and need from a software application service and that was indeed helpful in helping our team to develop a better yet real software application service.

In a nutshell, our team faces a lot of ups and downs throughout this 12 weeks of chaos. Nevertheless, our team had learnt a lot in terms of technical and soft skills. Getting to work in a stressful yet short duration of a project has helped each and everyone of us as an individual in a team to learn and discover new things while stepping out from our comfort zone which is not easy. As a student from the IT field of study, it has helped our team to have a wider and bigger picture of what reality feels like and to prepare us for the upcoming recession.

In addition, while working in a team, our team has gained some experience and has obtained the acknowledgement that our team has weaknesses too, as each of us have our own strengths and weaknesses. But, this shall not hold us back as our team took this as an early preparation, eye opener & giving us the time to buck up on our own skills.

7.2 Future Recommendation

The end product of the development is not the finalised product of this system. It is just merely the beginning of the system. In the near future, the developers will be able to explore further to enhance this system. Since it is just the beginning of something new, there is plenty of room for improvements and there will be more creative and innovative ideas and features to be implemented for the upcoming additional functions.

According to the sketch and the list of future recommendations, the team has decided to add in handy features such as: GPS functions that will ask the user for permission to use their location and this can help with the search of nearby kopitiam around the user.

One of the upcoming important features will be the ability to search for a user's sense of liking towards a certain type of food. The team will be doing some research on which API to implement where it can use the past data, cookies or search history to provide a list of recommendations according to the user's latest past searching in the system.

Besides that, the system will be allowing the users and kopitiam owner to upload videos. This is a plus point and useful feature where it can help to reduce the amount of pictures needed to be uploaded. Instead of uploading multiple pictures with no words or commenting, it will be replaced with the capability of adding videos with audio in it which can ease the users.

Next will be, the implementation of advanced Natural Language Processing (NLP) which will be used to filter out negative or offensive words used in review by users. Besides that, NLP is a part of machine learning where it is an extension of the artificial intelligence(AI) branch for computers to read, interpret and understand human language more and this could lead to the system capable of carrying out high-volume and repetitive tasks that would be impossible for humans to do so.

In addition, the implementation of more advanced image & video detection techniques which will be more efficient when it comes to detecting uploaded images and videos into the database. Since there will be implementation of video upload in the future, it is important to implement image and video processing detection so that no false videos or pictures can be uploaded which is inappropriate and a better yet suitable overall experience for all age groups of users.

Finally, when the team is able to possess more knowledge, it will be the release of mobile app support. Meaning, to produce an application available in Google Play Store for Android and Apps Store in IOS. This is an independent application where there is no need for reliability on browsers and the application will be able to have more functions such as offline service, better cloud service and many more.

USER MANUAL

Guest

Home

The screenshot shows the homepage of the Kopitiam Management System Pro. At the top right, there is a logo consisting of two overlapping diamonds, one red and one blue, followed by the text "Kopitiam Management System Pro". Below the logo, there are "Login" and "Register" buttons. The main content area has a search bar at the top with dropdown menus for "Showing kopitiams in: all states" and "that has: all food", and a "More Filter" checkbox. Below the search bar is a table listing two kopitiams:

Our Kopitiam ID	Image	Kopitiam Name	Kopitiam Address	Kopitiam Opening Hour	Kopitiam Closing Hour	Kopitiam Opening Days	To know more about a kopitiam, click select
41		Sin Nam Huat	22, Jalan Gooair, 11500	12:00	15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>
42		Sin Teong Nam	29, Jalan Teong, 44500	18:00	22:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday	<input type="button" value="Select"/>

The home page of our web application. Home page will show a list of kopitiams to the users.

Filter

Showing kopitiams in: that has: More Filter More Filter Checkbox

Keyword:

Status:

All Now Open Closed

Sort By Rating:

- Overall Rating
- Food Rating
- Hygiene Rating
- Service Rating
- Value Rating

Our Kopitiam ID	Image	Kopitiam Name	Kopitiam Address	Kopitiam Opening Hour	Kopitiam Closing Hour	Kopitiam Opening Days	To know more about a kopitiam, click select
41		Sin Nam Huat	22, Jalan Gooair, 11500	12:00	15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>

Two dropdown lists will show a list of state and food for user choosing. Click on the checkbox of more filters, guests can search by the keyword of kopitiams such as name and address of kopitiam. guests can sort the kopitiams by clicking on the checkboxes of 5 types rating. Clicking on the select button can take a look at the details of kopitiams.

Details of Kopitiams



Kopitiam Id: 41

Name: Sin Nam Huat

State: Johor

Address: 22, Jalan Gooair, 11500

[View in Google Map](#)

[View in Google Map Button](#)

Opening Hours: 12:00 to 15:00

Days Open: Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday

Halal: Yes

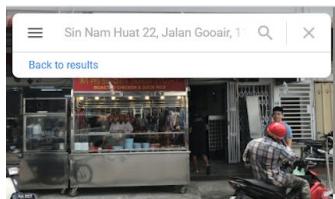
Stalls



Penang Wan Tan Mee

12:00 to 15:00

Penang Wan Tan Mee



Sin Nam Huat Roasted Chicken And Duck

4.0 ★★★★ (2)
Chicken restaurant

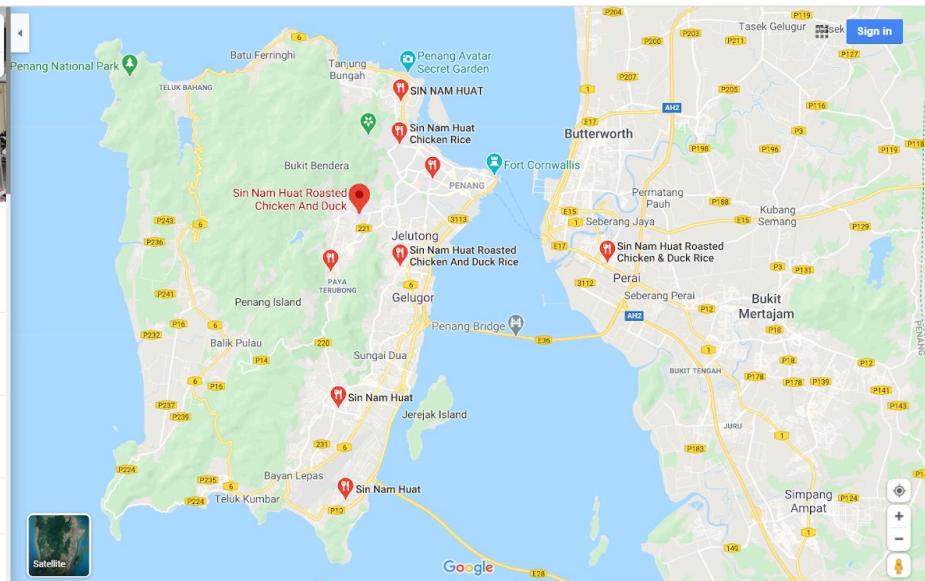
Directions Save Nearby Send to your phone Share

Verify info with this place

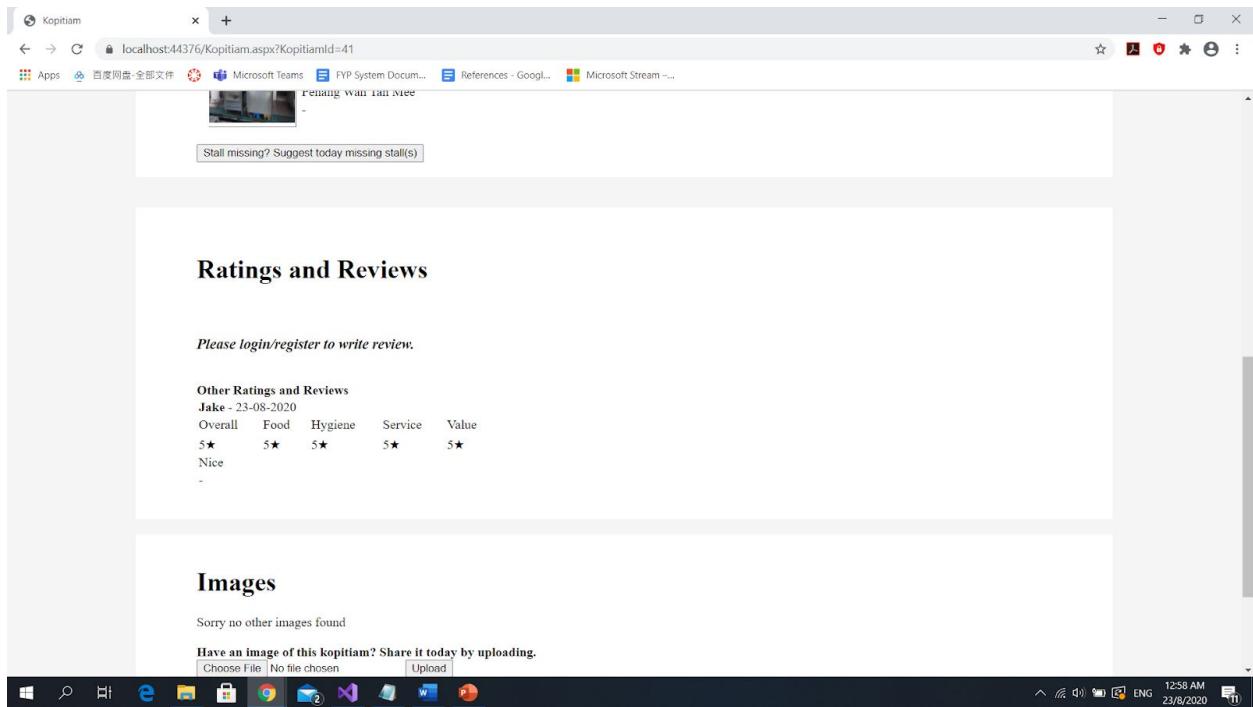
Hours or services may differ due to COVID-19

✓ Good for kids · ✓ Takeaway

10C AYER ITAM MK 16, 11500 Ayer Itam, Pulau Pinang



Guests can click on the button “view in Google Map” to have a navigation to the kopitiam.



Guests can view the details of the kopitiam such as the list of stalls in the kopitiams and the rating of other customers to that kopitiam.

Register

Go back

Welcome
Login or Register

Register

Please enter a valid email address and click on submit.

Email Address:

Submit Button

Improve Kopitiam Management System Pro by suggesting. [Click here to suggest](#)

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia [Click here to learn more about Kopitiam Management System Pro](#)

Guests can click on the register button on the top right corner to register an account.

Please enter a valid email address and click on submit.

Email Address:

An email containing a unique code has been sent to that email address.

Please enter that unique code here.

Kindly please fill up the other required particulars and click on verify.

Unique Code:

Name:

Password:

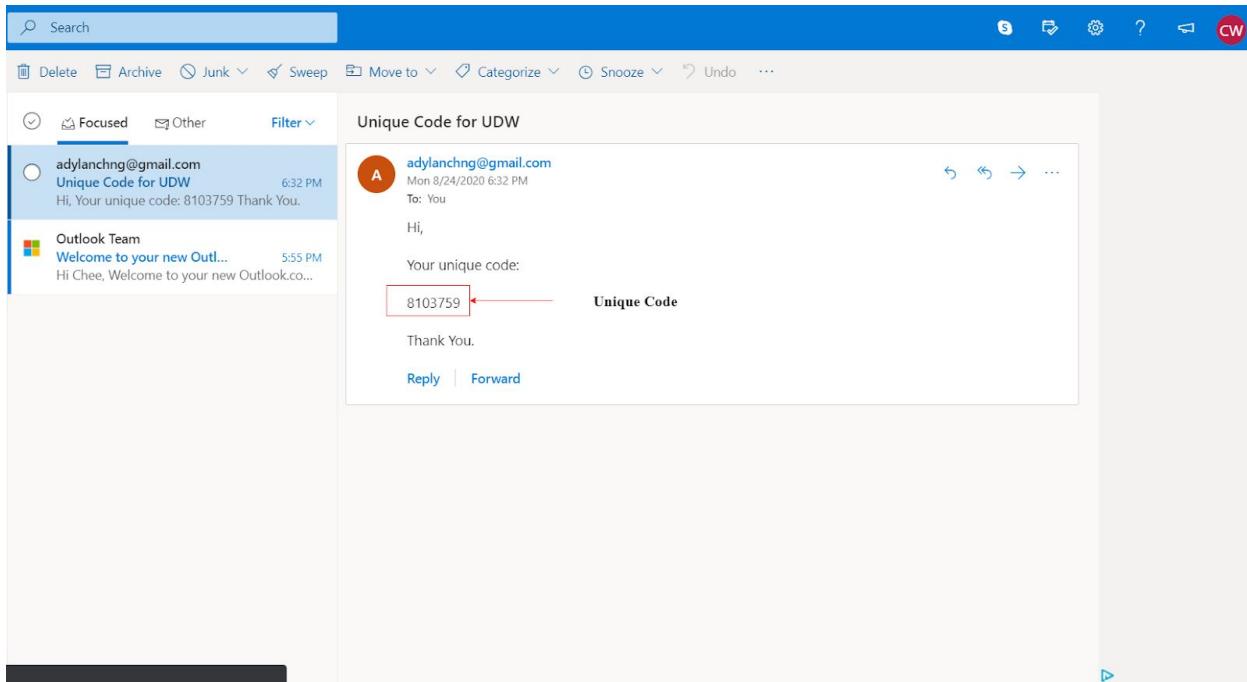
Re-type Password:

Verify Button

Improve Kopitiam Management System Pro by suggesting. [Click here to suggest](#)

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System will prompt guests to register page and require guests to enter their unique code, username, password and confirm password. Unique code will be sent to guests via email. Guest need to click on the “Verify” button to complete registration.



Email that contains unique code for registration.

Go back

Kopitiam Management System Pro

Welcome

Login or Register

Register

Please enter a valid email address and click on submit.

Email Address:

Success! You have successfully registered for an account on this Kopitiam Management System Pro

Improve Kopitiam Management System Pro by suggesting.

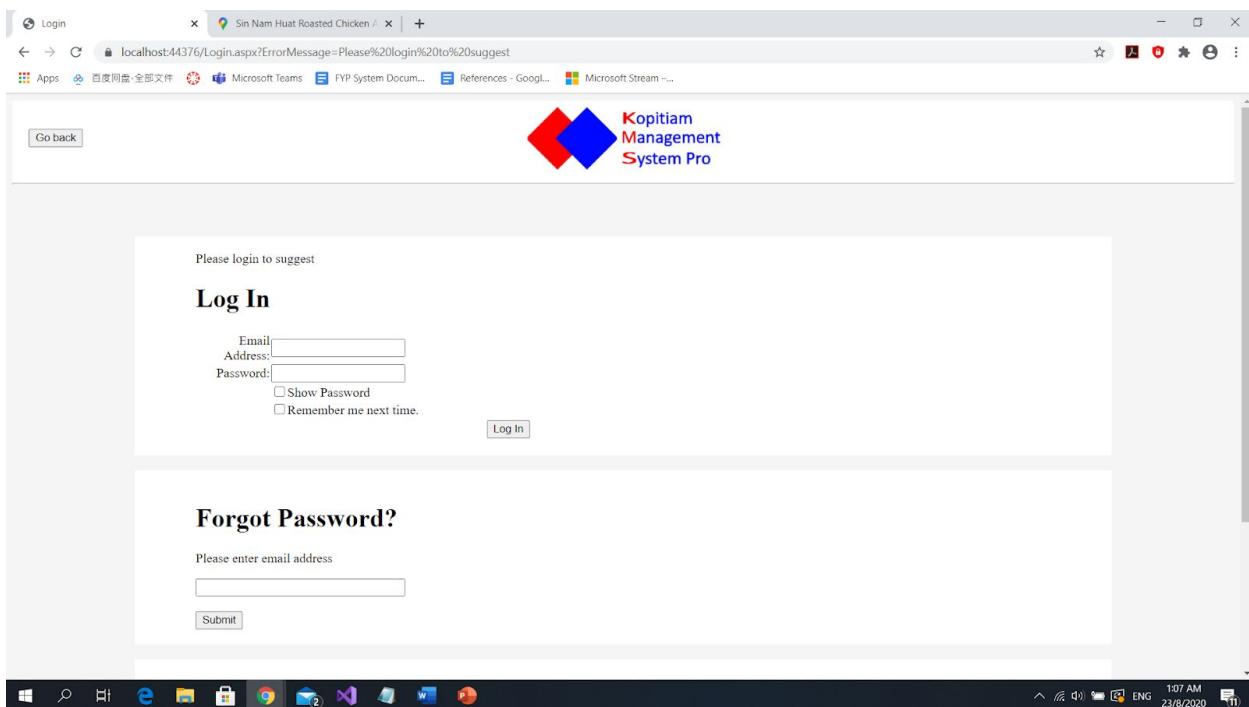
Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia.

System will notify guests their account registration has been successful.

Providing Suggestions



At the bottom of the home page have two buttons. One button is used to provide suggestions to us and the other one is used to navigate guests to other pages such as home page, kopitiam page and stall page.



Guests who click on the button “Click here to suggest” are required to login to an account in order to provide suggestions.

Registered User

Login

The screenshot shows the homepage of the Kopitiam Management System Pro. At the top right, there is a red-bordered button labeled "Login" and a grey button labeled "Register". Below the header, there is a search bar with dropdown menus for "Showing kopitiams in: all states" and "that has: all food", followed by a "More Filter" checkbox. A red arrow points from the text "URL prompt to login page" to the "Login" button.

Our Kopitiam ID	Image	Kopitiam Name	Kopitiam Address	Kopitiam Opening Hour	Kopitiam Closing Hour	Kopitiam Opening Days	To know more about a kopitiam, click select
41		Sin Nam Huat	22, Jalan Gooair, 11500	12:00	15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>
42		Sin Teong Nam	29, Jalan Teong, 44500	18:00	22:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday	<input type="button" value="Select"/>

The screenshot shows two overlapping pages. The top page is titled "Log In" and contains fields for "Email/Address" (dylanchng@outlook.com), "Password" (redacted), "Show Password" (checkbox), and "Remember me next time" (checkbox). It also features a "Log In" button. The bottom page is titled "Forgot Password?" and asks for an "Email address" (redacted) and a "Submit" button.

[Go back](#)



Log In

Email:

Address:

Password:

Show Password
 Remember me next time

Show Password & Remember me next time checkbox

Forgot Password?

Please enter email address

Registered user can click on the login at the top right corner to login their own account. At the login page, user required to enter their email address and password. User can click on the checkbox of the “Show Password” to change the password to visible. User can click on the checkbox of “Remember me next time” in order to login faster next time.

Forgot Password



Please login to suggest

Log In

Email:

Address:

Password:

Show Password

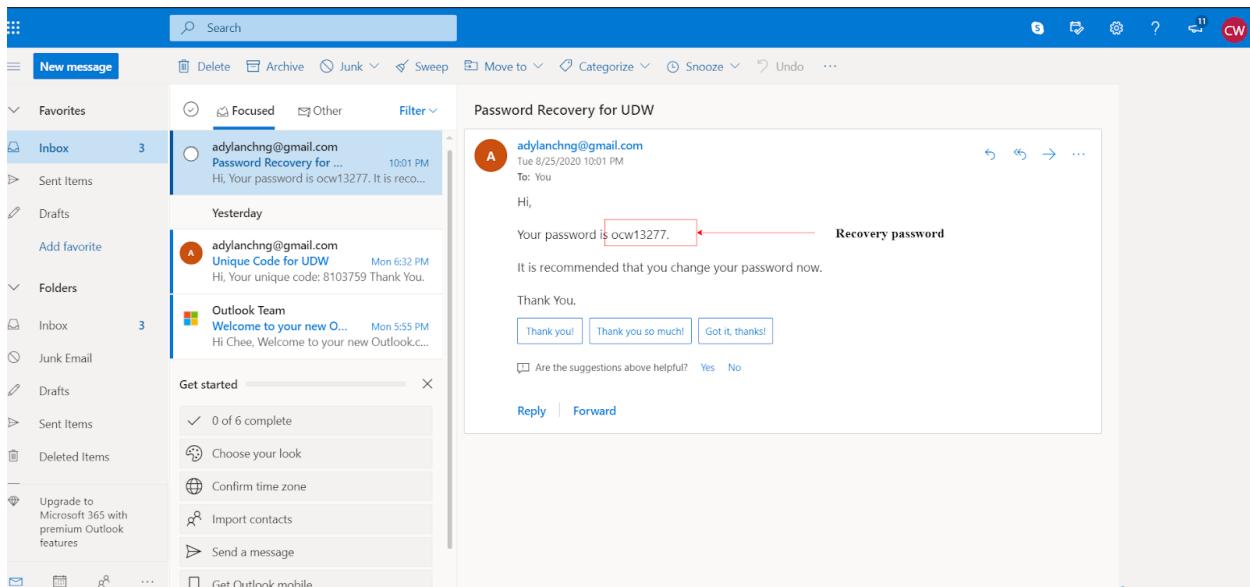
Remember me next time.

Forgot Password?

Please enter email address

Forgot Password?

Please enter email address



New message

Search

Favorites

Inbox 3

Sent Items

Drafts

Add favorite

Folders

Inbox 3

Junk Email

Drafts

Sent Items

Deleted Items

Upgrade to Microsoft 365 with premium Outlook features

Get started

0 of 6 complete

Choose your look

Confirm time zone

Import contacts

Send a message

Get Outlook mobile

Password Recovery for UDW

A adylanchng@gmail.com
Tue 8/25/2020 10:01 PM
To: You
Hi,
Your password is **ocw13277.** ocw13277. **Recovery password**

It is recommended that you change your password now.

Thank You.

Are the suggestions above helpful? Yes No

[Reply](#) | [Forward](#)

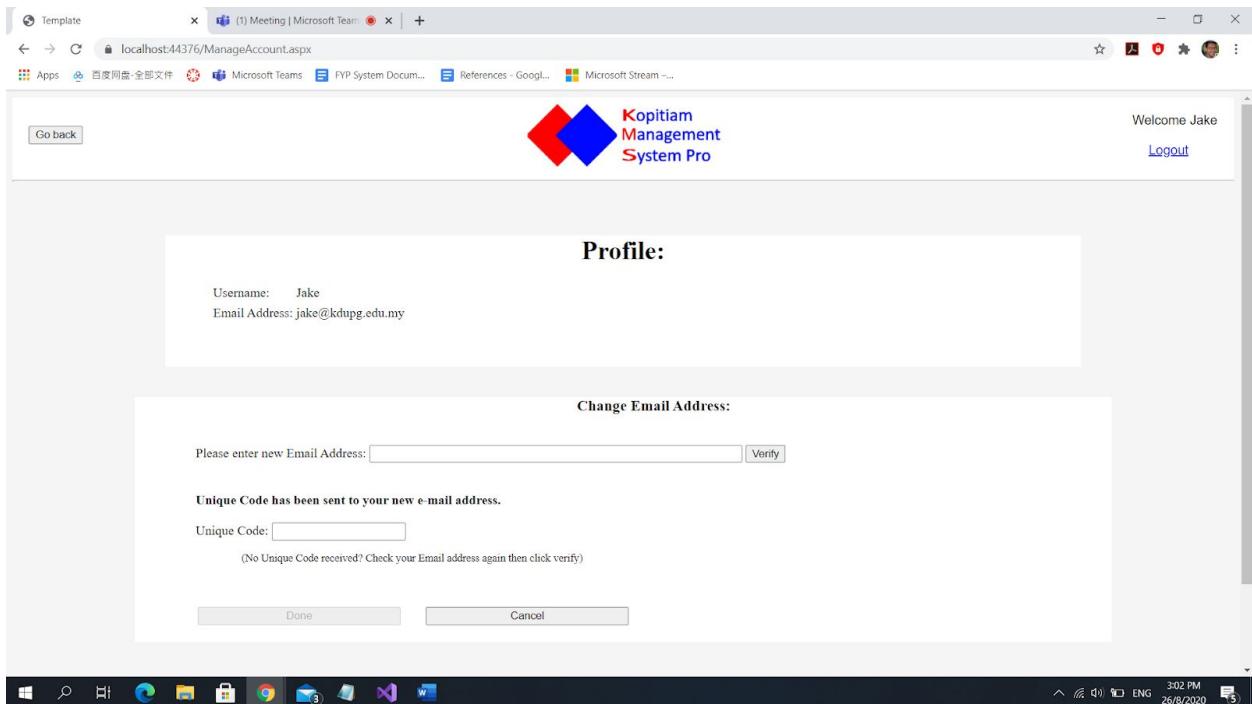
User who forgot their password can enter their email address at the login page and click submit. System will send an email to the user where they contain their account password and recommend the user to change their password.

Manage Profile

The screenshot shows the homepage of the Kopitiam Management System Pro. At the top right, there is a welcome message "Welcome Bob" with "Account Setting" and "Logout" buttons. On the left, there is a search bar with dropdowns for "Showing kopitiams in: all states" and "that has: all food", a "More Filter" checkbox, and a "Keyword:" input field. Below the search bar are filters for "Status: All", "Sort By Rating: Overall Rating, Food Rating, Hygiene Rating, Service Rating, Value Rating", and a "Search" button. The main content area displays a table with columns: Our Kopitiam ID, Image, Kopitiam Name, Kopitiam Address, Kopitiam Opening Hour, Kopitiam Closing Hour, Kopitiam Opening Days, and To know more about a kopitiam, click select. One row is shown for "Sin Nam Huat" located at "22, Jalan Gooair, 11500".

The screenshot shows the "Account Control" page. At the top right, there is a welcome message "Welcome Bob" with "Logout" and a "Go back" button. The center features the system logo. Below the logo, the user information "Username: Bob" and "Email Address: dylanchng@outlook.com" is displayed. Three buttons are present: "Change E-Mail", "Change Username", and "Change Password", each with a corresponding "Change [button]" button below it. At the bottom, there is a suggestion box with "Click here to suggest" and a link "Click here to learn more about Kopitiam Management System Pro".

User can manage their account by click on the button “Account Setting” which located at top right corner of home page. System will prompt user to manage profile page and the page contain of 3 buttons “Change E-mail”, “Change Username” and “Change Password”.



“Change E-mail” button will prompt user to Change Email Address page and user required to enter a new Email Address to change the old Email Address and click on the “Verify” button. System will send an Email containing unique code to the user's new Email Address.

Go back

Kopitiam Management System Pro

Welcome Jake
[Logout](#)

Profile:

Username:

Email Address: jake@kdupg.edu.my

Improve Kopitiam Management System Pro by suggesting. [Click here to suggest!](#)

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“Change Username” button will prompt the user to change the username page. User can change their username and click on the “Done” button.

Go back

Kopitiam Management System Pro

Welcome Jake
[Logout](#)

Profile:

Username: Jake
Email Address: jake@kdupg.edu.my

Change Password:

Old Password: Show Password

New Password: Show Password

Confirm Password:

Improve Kopitiam Management System Pro by suggesting. [Click here to suggest!](#)

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“Change Password” button will prompt the user to change the password page. User who want to change their password are required to enter their current password on the first textbox. User can enter their new password at the second text box and confirm their new password at the third textbox. User can click on the “Done” button to change their new password.

Add Stall



Kopitiam Id: 42
Name: Sin Teong Nam
State: Johor
Address: 29, Jalan Teong, 44500
[View in Google Map](#)
Opening Hours: 18:00 to 22:00
Days Open: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday
Halal: No

Stalls

There is no stall in this kopitiam :(

[Stall missing? Suggest today missing stall\(s\)](#)

← Add stall button

Ratings and Reviews

User who want to add a stall can click on the button “Stall missing? Suggest today missing stall(s)”.

Step 2 out of 2) Please enter the following particulars:

Kopitiam: 42 | Sin Teong Nam

Food: Wan Tan Mee

Name: Penang Wan Tan Mee

Operation Hours: 18:00 to 22:00

Opening Days:

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

Picture: Choose File InkedP8183506_L1.jpg

Halal:

- No
- Yes

Submit button

System will prompt the user to add stall page and provide two steps to guide the user to add a stall. User need to select the food in the dropdown list and the name of the stall at the name textbox. The operating hours are used 24 hours clock for the user providing the correct operating hours of the stall and the user can tick the checkbox for the operation days. User need to upload an image of the stall and tick the checkbox whether the food is halal or not. User can click on the button “Finished? Click here to submit” to do the add stall.

Go back

Kopitiam Management System Pro

Welcome Bob [Account Setting](#) [Logout](#)

Sucess! Suggestion has been suggested.

Step 1 out of 2) Please select the type of suggestion you want to provide

General
 Add Kopitiam
 Add Stall to Kopitiam
 Become Owner to Kopitiam

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[Click here to learn more about Kopitiam Management System Pro](#)

The system will pop out “Success! Suggestion has been suggested.” while the user adds a stall.

The stall that is added by the user will be shown on the kopitiam while the web admin approves the suggestion.

Rating & Reviews

Kopitiam

localhost:44376/Kopitiam.aspx?KopitiamId=42

Ratings and Reviews

Write a review

Overall Rating:

Food Rating:

Hygiene Rating:

Service Rating:

Value Rating:

1-5 stars rating checkbox

Review textbox

Submit button

Other Ratings and Reviews

Sorry, we got no reviews for you :(

1007 PM 23/8/2020

The overall rating, food rating, hygiene rating, service rating and value rating can be rated from 1 – 5 stars by the user. User can write a review to the kopitiam and click submit while done writing.

Ratings and Reviews

Your review

Overall Rating: ★ ★★ ★★★ ★★★★ ★★★★★

Food Rating: ★ ★★ ★★★ ★★★★ ★★★★★

Hygiene Rating: ★ ★★ ★★★ ★★★★ ★★★★★

Service Rating: ★ ★★ ★★★ ★★★★ ★★★★★

Value Rating: ★ ★★ ★★★ ★★★★ ★★★★★

Food is nice !!!

Other Ratings and Reviews

Bob - 23-08-2020

Overall	Food	Hygiene	Service	Value
5★	5★	5★	5★	5★

Food is nice !!!

The rating and review given by the user will show at the bottom of the review textbox.

Upload Kopitiam Image

Other Ratings and Reviews

Bob - 23-08-2020

Overall	Food	Hygiene	Service	Value
5★	5★	5★	5★	5★

Food is nice !!!

Images

Sorry no other images found

Have an image of this kopitiam? Share it today by uploading.

Improve Kopitiam Management System Pro by suggesting.

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia

User can upload another picture of the kopitiam at the bottom of the kopitiam page. User can click on the “Upload” button while the picture has been chosen.

Providing Suggestions



User who wish to improve our web application can provide suggestions to us by clicking on the button “Click here to suggest”.

[Go back](#)

Welcome Bob [Account Setting](#) [Logout](#)

 Kopitiam
Management
System Pro

Step 1 out 2) Please select the type of suggestion you want to provide

General
 Add Kopitiam
 Add Stall to Kopitiam
 Become Owner to Kopitiam

Type of suggestions checkbox

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia

[Click here to learn more about Kopitiam Management System Pro](#)

[Go back](#)

Welcome Bob [Account Setting](#) [Logout](#)

 Kopitiam
Management
System Pro

Step 1 out 2) Please select the type of suggestion you want to provide

General
 Add Kopitiam
 Add Stall to Kopitiam
 Become Owner to Kopitiam

Step 2 out of 2) Please enter your message:

Finished? [Click here to submit.](#)

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia

[Click here to learn more about Kopitiam Management System Pro](#)

Step 1 out of 2) Please select the type of suggestion you want to provide

General
 Add Kopitiam
 Add Stall to Kopitiam
 Become Owner to Kopitiam

Step 2 out of 2) Please enter your message:

The user interface can make more beautiful.

General Suggestions Textbox

Submitted? Click here to submit

Submit button

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[Click here to learn more about Kopitiam Management System Pro](#)

User can click on the “General” checkbox to provide suggestions to us. User can write their suggestions on the textbox provided and click on the button “Finished? Click here to submit” while done writing.

Sucess! Suggestion has been suggested.

Step 1 out of 2) Please select the type of suggestion you want to provide

General
 Add Kopitiam
 Add Stall to Kopitiam
 Become Owner to Kopitiam

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[Click here to learn more about Kopitiam Management System Pro](#)

The system will pop out “Success! Suggestion has been suggested” to user while user submit their suggestions.

Add Kopitiam

Add Kopitiam
 Add Stall to Kopitiam
 Become Owner to Kopitiam

Step 2 out 2) Please enter the following particulars:

State:

 Name:

 Operation Hours: to

 Opening Days:
 Monday
 Tuesday
 Wednesday
 Thursday
 Friday
 Saturday
 Sunday

Picture: P8183538.JPG

Address:

Halal:
 No
 Yes

User can suggest kopitiam to web admin by clicking on the checkbox of “Add Kopitiam”. User required to select the state of the kopitiam located, enter the name of the kopitiam, operating hours, operation days, upload a picture of the kopitiam, address of the kopitiam and the kopitiam food halal or not. The suggestion of the user will be sent to the web admin to approve or reject.

 55	 1997	Jalan Paya Terubong	12:00	15:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>
 56	 Xin Lye Lye	Jalan Trengganu, 11600 George Town, Pulau Pinang	08:00	01:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>

Improve Kopitiam Management System Pro by suggesting.

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia

[Click here to suggest](#)

[Click here to learn more about Kopitiam Management System Pro](#)

New Added Kopitiam

The suggestion will be added to the home page while web admin approval.

Become Owner of Kopitiam

Become Owner to Kopitiam

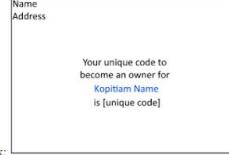
Step 2 out of 2) Please read through and enter the required particulars:

Tell us that you are the owner of a kopitiam.

We will send you a postcard with a unique code that you can insert into [our verify code page](#).

Postcard sample:

Front : 

Back: 

Then you will be able to edit the details of your kopitiam and stalls instantly!

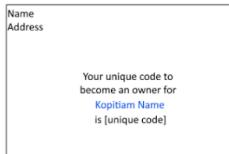
More features for kopitiam owners to come soon.

If you are the owner of more than 1 kopitiam, you can fill up this form again.

On a Kopitiam page, you may find the Kopitiam Id at the top below the first image as illustrated below:

Postcard sample:

Front : 

Back: 

Then you will be able to edit the details of your kopitiam and stalls instantly!

More features for kopitiam owners to come soon.

If you are the owner of more than 1 kopitiam, you can fill up this form again.

On a Kopitiam page, you may find the Kopitiam Id at the top below the first image as illustrated below:

Please select your kopitiam Kopitiam: More Filter

Filter By:
Kopitiam Name:
Address:
State:
Search

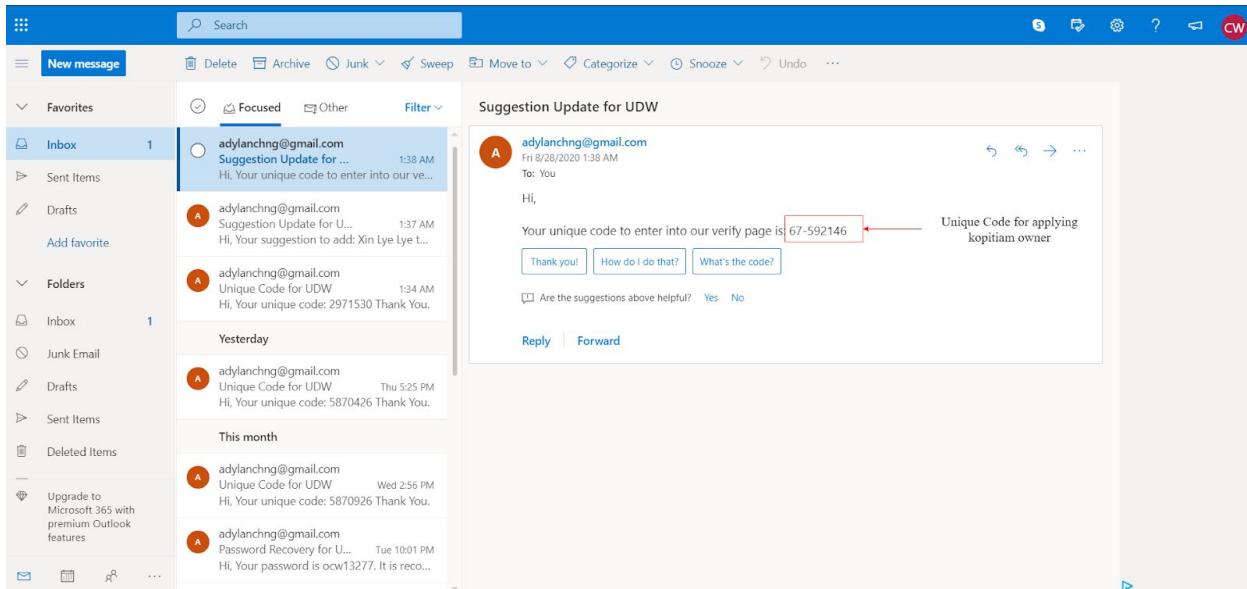
Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia

[Click here to learn more about Kopitiam Management System Pro](#)

Users who own a kopitiam and wish to become a kopitiam owner on our web application can apply to become a kopitiam owner by clicking on the checkbox of the “Become Owner to Kopitiam”. System will guide users how to become an owner of kopitiam. At the bottom of the page to become an owner of kopitiam required users to choose their own kopitiam on the

dropdown list. Admin will send a postcard to the user which contains unique code to verify the user via email within 7 days.

Unique Code for applying Kopitiam Owner



Welcome Wei | Account Setting | Logout

Postcard sample:

Front :  **Kopitiam Management System Pro**
State of the art service for all things Kopitiam in Malaysia

Back: Name Address
Your unique code to become an owner for Kopitiam Name is [unique code]

Your code is located on the back of the postcard sent to your kopitiam address.

Please enter code: **Textbox used to enter unique code**

Submit button

Improve Kopitiam Management System Pro by suggesting. [Click here to suggest](#)

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Users can access the verify code page on the become owner to kopitiam page and enter the unique code sent by system via email.

Kopitiam Owner

Home page of Kopitiam Owner

Go to Owner Portal  Owner Portal button

Welcome Alice [Account Setting](#) [Logout](#)

Showing kopitiams in: that has: More Filter

Our Kopitiam ID	Image	Kopitiam Name	Kopitiam Address	Kopitiam Opening Hour	Kopitiam Closing Hour	Kopitiam Opening Days	To know more about a kopitiam, click select
41		Sin Nam Huat	22, Jalan Gooair, 11500	12:00	15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>
							

Kopitiam owner had a button at the top left corner “Go to Owner Portal”.

Manage Kopitiams

[Go back](#)
Welcome Alice
[Account Setting](#)
[Logout](#)



Your Kopitiam: Filter

Id	Name	State	Address	Operation Hours	Operation Week	Halal	Status	Image	Edit	Select
41	Sin Nam Huat	Johor	22, Jalan Gooair, 11500	From 12:00 To 15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	Yes	In Business		Edit	Select
42	Sin Teong Nam	Johor	29, Jalan Teong, 44500	From 18:00 To 22:00	Monday,Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday	No	In Business		Edit	Select

Improve Kopitiam Management System Pro by suggesting.

[Click here to suggest](#)

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[Click here to learn more about Kopitiam Management System Pro](#)

System will show a list of kopitiams that the kopitiam owner owns. Kopitiam Owner can click on the “Edit” button to edit the information of the kopitiam. Owner can click on the “Select” button to manage the stalls.


Welcome Alice [Account Setting](#) [Logout](#)

Your Kopitiam: Filter

ID	Name	State	Address	Operation Hours	Operation Week	Halal	Status	Image	Edit	Stalls
41	Sin Nam Huat	Penang	22, Jalan Gooair, 11500	From 12:00 To 15:00	Monday,Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday	Yes	In Business		Edit	Select
42	Sin Teong Nam	Johor	29, Jalan Teong, 44500	From 18:00 To 22:00	Monday,Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday	No	In Business		Edit	Select

Improve Kopitiam Management System Pro by suggesting.

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia

[Click here to suggest!](#)

[Click here to learn more about Kopitiam Management System Pro](#)

Name:

State:

Address:

Operation Hours: to

Opening Days:

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

Halal:

- No
- Yes

Status:

- In Business
- Closed Down

Picture: No file chosen

Note: Our website has filter system that need time to verify your image is relevant if updating image

The information will change at the owner portal page while the kopitiam owner edits the information and clicks on the “Update” button.

[Go back](#)Welcome Alice [Account Setting](#)[Logout](#)

Review button to view stall review

Kopitiam Name:	Sin Nam Huat	Kopitiam Reviews	
		Add stall button	Review button to view kopitiam reviews
ID	Name	Operation Hours	Operation Days
9	Penang Wan Tan Mee	From 12:00 To 15:00	Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday
			Wan Tan Mee Noodle
			Edit Review Select Review

Review For Your Kopitiam:

[Name](#) [Comment](#) [Date](#) [Overall Rating](#) [Food](#) [Hygiene](#) [Service](#) [Value](#)

Improve Kopitiam Management System Pro by suggesting.

[Click here to suggest](#)

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia

[Click here to learn more about Kopitiam Management System Pro](#)

Kopitiam owners can view the list of selected kopitiam's stalls . The review of the kopitiam will be shown below the stalls list. Kopitiam owner can add a new stall instantly by clicking on the “Add Stall” button. The review of the kopitiam will be shown below the list of stalls by clicking on the “Kopitiam Reviews” button.

Please update the following particulars:

Stall ID: 9 [Remove Stall](#)

Name:

Food:

Operation Hours: to

Opening Days:

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

Picture: No file chosen

[Update](#) [Cancel](#)

Kopitiam owner can edit the stall information by clicking on the “Select” button beside the stall.

Go back

Welcome Alice [Account Setting](#) [Logout](#)

Kopitiam Management System Pro

Kopitiam Name: Sin Nam Huat [Kopitiam Reviews](#)

Add Stall	Id	Name	Operation Hours	Operation Days	Food	FoodCategory	Image	Edit	Review
	9	Penang Wan Tan Mee	From 12:00 To 15:00	Monday,Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday	Wan Tan Mee	Noodle		Select	Review

Review For Your Kopitiam:

[Name](#) [Comment](#) [Date](#) [Overall Rating](#) [Food](#) [Hygiene](#) [Service](#) [Value](#)

Improve Kopitiam Management System Pro by suggesting. [Click here to suggest!](#)

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The information of the stall will be updated while the kopitiam owner clicks on the “Update” button.

Go back

Welcome Alice [Account Setting](#) [Logout](#)

Kopitiam Management System Pro

Kopitiam Name: Sin Nam Huat [Kopitiam Reviews](#)

Add Stall	Id	Name	Operation Hours	Operation Days	Food	FoodCategory	Image	Edit	Review
	9	Penang Wan Tan Mee	From 12:00 To 15:00	Monday,Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday	Wan Tan Mee	Noodle		Select	Review

Review For Stall: Penang Wan Tan Mee

[Name](#) [Comment](#) [Date](#) [Overall Rating](#) [Food](#) [Hygiene](#) [Service](#) [Value](#)

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Kopitiam owners can click on the “Review” button beside the stall to view the reviews of the stall.

Disown Kopitiam

Your Kopitiam: Filter

Please update the following particulars:
Kopitiam ID: 41

Name:

State:

Address:

Operation Hours: to

Opening Days:

Monday
 Tuesday
 Wednesday
 Thursday
 Friday
 Saturday
 Sunday

Halal:

No

Welcome Alice

 **Kopitiam
Management
System Pro**

Disown Kopitiam button



Welcome Alice [Account Setting](#)
[Logout](#)

We will send a suggestion to admin for disowning your kopitiam. Process will take less than a week.

Are you sure you want to disown your kopitiam? This action cannot be undone.
 No Yes Yes & No Checkbox

Type: DISOWN to continue
 Textbox used to enter "DISOWN"

Submit & Cancel button

Improve Kopitiam Management System Pro by suggesting. [Click here to suggest!](#)

Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia [Click here to learn more about Kopitiam Management System Pro](#)

Owner can click on the “Edit” button at the owner portal page to disown the kopitiam. The edit page will have a “Disown Kopitiam” button. The button will prompt the owner to disowning page. Owner can follow the guide to disown the kopitiam.

Web Administrator

Home page of Web Admin

Go to Admin Portal

Admin Portal button



Welcome Dylan Account Setting
Logout

Showing kopitiams in: all states that has: all food More Filter

Our Kopitiam Image ID	Kopitiam Name	Kopitiam Address	Kopitiam Opening Hour	Kopitiam Closing Hour	Kopitiam Opening Days	To know more about a kopitiam, click select
41	Sin Nam Huat	22, Jalan Gooair, 11500	12:00	15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>
42	Sin Teong Nam	29, Jalan Teong, 44500	18:00	22:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday	<input type="button" value="Select"/>

Web admin login to the web application will have a button “Go to Admin Portal” on the top left corner of the home page.

Managements

Add Food

A new food or food category just got invented?
No problem. Add it to our database today!

Add Food button

Caches Data

Feel the system is taking too much spaces?
Purge the cached data in one click!

Clear Image Caches button

Delete Reviews

Found a comment or comments in violation of community guidelines?
Delete them!

Manage Reviews button

Make General User an Admin

Being web admin can be difficult.
Promote a general user to become a web admin to lessen the burden.

Change User Type button

Manage Kopitiams and Stalls

Kopitiams and its stalls don't stay the same forever.
Keep the information up to date by managing kopitiams.
From there, you can manage the stalls.

Manage Kopitiams button

Review Suggestions

General users improves Kopitiam Management System Pro by suggesting.
Review these suggestions to approve or disapprove of general users suggestions.
There are 3 types of suggestions: General, Kopitiam and Stall.

View General Suggestions button
 View Kopitiam Suggestions button
 View Stall Suggestions button

Send Post Card

To assist a user claiming ownership of a kopitiam, please send the user a post card.

Send Postcard button

At the admin portal page, admin can add new food in the food list, delete reviews, change user type, manage kopitiams, review general suggestions, review kopitiam suggestions, review stall suggestions and send a postcard to users who want to become an owner to a kopitiam.

Add Food

Welcome Dylan Account Setting Logout

Registered food

ID	Name	Category	Action
1	Char Koay Teow	Noodle	Edit
2	Ban Mee	Noodle	Edit
3	Curry Mee	Noodle	Edit
4	Hokkien Mee	Noodle	Edit
5	Laksa	Noodle	Edit
6	Lor Mee	Noodle	Edit
7	Maggie Goreng	Noodle	Edit
8	Mee Bandung Muar	Noodle	Edit
10	Roasted Chicken Wing	Meat	Edit
11	Porridge	Rice	Edit
12			

Add Food:

Name:

Category: Please Select

Admin can add a new food or new food category into the database at the add food page by clicking on the “Add Food” button on the admin portal page.

Welcome Dylan Account Setting Logout

Registered food

ID	Name	Category	Action
12	Economy Rice	Rice	<input type="button" value="Edit"/>
13	Popiah	Bread	<input type="button" value="Edit"/>
14	Chai Kuih	Cakes and Pastries	<input type="button" value="Edit"/>
15	Yam Cake	Cakes and Pastries	<input type="button" value="Edit"/>
16	Chee Cheong Fun	Noodle	<input type="button" value="Edit"/>
17	Nasi Lemak	Rice	<input type="button" value="Edit"/>
18	Bak Chang	Rice	<input type="button" value="Edit"/>
19	Chicken Rice	Rice	<input type="button" value="Edit"/>
20	Wan Tan Mee	Noodle	<input type="button" value="Edit"/>
21	Fried Noodle	Noodle	<input type="button" value="Edit"/>
12			

Edit button to edit the selected food

Add Food:

Name: Curry Fish Head

Category: Fish

Food Name textbox

Drop down list of food category

Add & Clear button

Add new food category button

Admin can enter the food name and choose the category of food. The new food will be added into the database while admin clicks on the “Add” button. Admin who want to add a new food category can click on the button “Add category”.

[Go back](#)

 Welcome Dylan [Account Setting](#) [Logout](#)

Registered food

<u>Id</u>	<u>Name</u>	<u>Category</u>	<u>Action</u>
22	Curry Fish Head	Fish	Edit
1	2	3	

Edit button to edit the selected food

Add Food:

Name:

Category:

[Add](#) [Clear](#)

[Add Category](#)

New food has been added successful

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The new food will show in the food list while added into the database.

Manage Reviews

The screenshot shows the 'Review List' section of the admin portal. At the top, there are filter options: 'User: all user', 'Kopitiam: all kopitiam', 'Comment keyword: [empty input]', and 'Date: dd/mm/yyyy'. Below these are search and clear filters buttons. A table displays two review entries:

ID	User ID	Kopitiam	Staff	Overall Rating	Comment	Date	Select
247		Sin Nam Huat		5	Nice	23-08-2020	<input type="checkbox"/>
265		Sin Teong Nam		5	Food is nice !!!	23-08-2020	<input type="checkbox"/>

Below the table are buttons for 'Select All', 'Invert Selection', and 'Clear Selection'. At the bottom are 'Delete' and 'Cancel' buttons.

At the bottom of the page, there are two links: 'Click here to suggest!' and 'Click here to learn more about Kopitiam Management System Pro'.

At the admin portal page, admin can manage the reviews by clicking on the button “Delete Reviews”. The delete reviews page will show all the reviews of every kopitiam. Admin can delete reviews which contain bad words.

This screenshot is identical to the one above, but it includes several red arrows and labels pointing to specific UI elements:

- An arrow points from the text "Filter reviews by user type" to the "User: all user" dropdown.
- An arrow points from the text "Filter reviews by kopitiam" to the "Kopitiam: all kopitiam" dropdown.
- An arrow points from the text "Filter reviews by keyword" to the "Comment keyword: [empty input]" field.
- An arrow points from the text "Filter reviews by date" to the "Date: dd/mm/yyyy" field.
- An arrow points from the text "Select All Reviews button, Invert Selection button & Clear Selection button" to the "Select All", "Invert Selection", and "Clear Selection" buttons below the table.
- An arrow points from the text "Delete Reviews button & Cancel button" to the "Delete" and "Cancel" buttons at the bottom of the table.
- An arrow points from the text "Checkbox used to select review" to the checkbox in the "Select" column of the table.

Other elements remain the same as the first screenshot.

Go back



Welcome Dylan [Account Setting](#)
[Logout](#)

Review List:

User: Kopitiam: Comment keyword:

ID	User Id	Kopitiam	Stall	Overall Rating	Comment	Date	Select
26	5	Sin Teong Nam	5	5	Food is nice !!!	23-08-2020	<input type="checkbox"/>

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Admin can take action on the selected review by clicking on the checkbox of the review and delete it.

Ratings and Reviews

[Write a review](#)

Overall Rating:

Food Rating:

Hygiene Rating:

Service Rating:

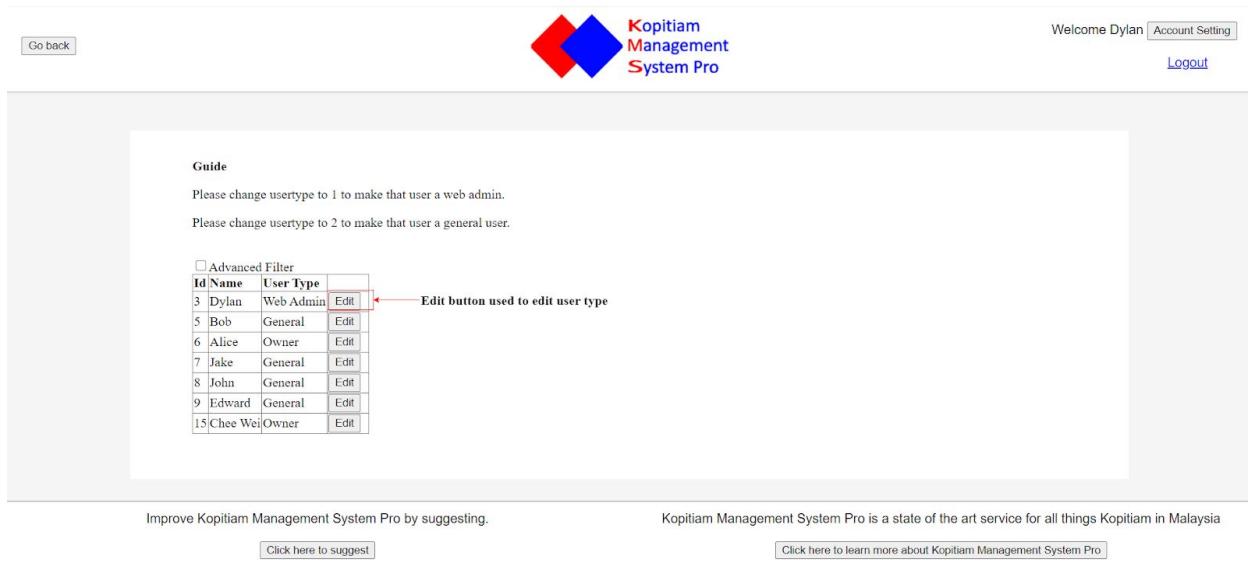
Value Rating:

Other Ratings and Reviews

Sorry, we got no reviews for you :(

The review at the kopitiam page will be deleted.

Change User Type

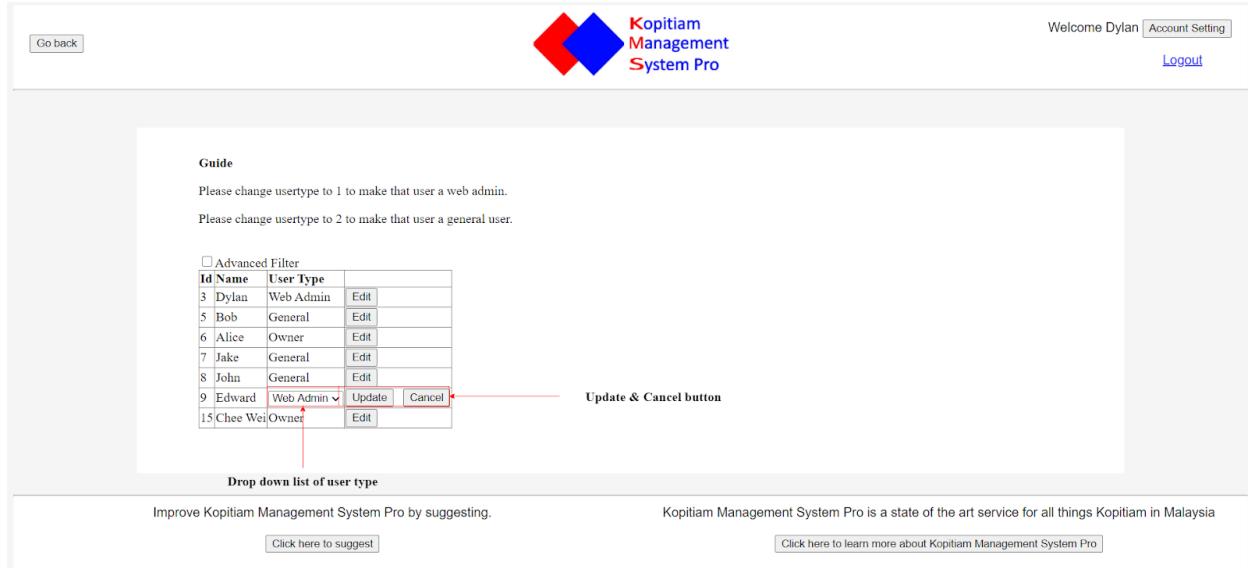


The screenshot shows a user interface for managing users. At the top right, there are links for "Welcome Dylan", "Account Setting", and "Logout". On the left, a "Go back" button is visible. In the center, there is a logo for "Kopitiam Management System Pro" featuring red and blue diamonds. Below the logo is a table titled "User Type" with columns for "Id", "Name", and "User Type". The "User Type" column contains several "Edit" buttons, one of which is highlighted with a red box and a red arrow pointing to it, labeled "Edit button used to edit user type". The table data is as follows:

Id	Name	User Type
3	Dylan	Web Admin
5	Bob	General
6	Alice	Owner
7	Jake	General
8	John	General
9	Edward	General
15	Chee Wei	Owner

Below the table, there is a "Guide" section with instructions: "Please change usertype to 1 to make that user a web admin." and "Please change usertype to 2 to make that user a general user." At the bottom of the page, there are links for "Click here to suggest", "Click here to learn more about Kopitiam Management System Pro", and a footer message: "Kopitiam Management System Pro is a state of the art service for all things Kopitiam in Malaysia".

Admin can change the type of user such as Web Admin, Kopitiam Owner and General at the make general user admin page.



This screenshot shows the same user interface as the previous one, but with a different focus. A red arrow points to a dropdown menu in the "User Type" column of the last row (Chee Wei). Another red arrow points to the "Update" and "Cancel" buttons at the bottom right of the table, labeled "Update & Cancel button". The table data is identical to the previous screenshot.

Admin need to click on the “Edit” button to edit the user type and choose the user type in the dropdown list.

[Go back](#)



Welcome Dylan [Account Setting](#)
[Logout](#)

Guide

Please change usertype to 1 to make that user a web admin.

Please change usertype to 2 to make that user a general user.

Advanced Filter

Id	Name	User Type	Action
3	Dylan	Web Admin	Edit
5	Bob	General	Edit
6	Alice	Owner	Edit
7	Jake	General	Edit
8	John	General	Edit
9	Edward	Owner	Edit
15	Chee Wei	Owner	Edit

User Type has been changed successful

Update successful

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The user type of that person will change while the admin clicks on the “Update” button.

Manage Kopitiams

The screenshot shows a web-based management system for kopitiams. At the top right, there are links for "Welcome Dylan", "Account Setting", and "Logout". The main area displays a table of kopitiams with the following columns: Id, Name, State, Address, Operation Hours, Operation Week, Halal Status, Image, Edit, Stalls, and Owner. Red arrows point from the "Edit", "Select", and "Remove" buttons in the last three columns to their respective labels above the table.

Id	Name	State	Address	Operation Hours	Operation Week	Halal Status	Image	Edit	Stalls	Owner	
41	Sin Nam Huat	Johor	22, Jalan Gooair, 11500	From 12:00 To 15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	Yes	In Business		Edit	Select	Remove
42	Sin Teong Nam	Johor	29, Jalan Teong, 44500	From 18:00 To 22:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	No	In Business		Edit	Select	Remove
43	818 Best Coffee Shop	Johor	818, Jalan Coffee, 83477	From 09:00 To 12:00	Wednesday, Thursday, Friday, Saturday, Sunday	Yes	In Business		Edit	Select	Remove
44	Keat Seng	Kedah	78, Jalan Keat, 83478	From 12:00 To 24:00	Monday, Wednesday, Thursday, Friday, Saturday, Sunday	No	In Business		Edit	Select	Remove

Click on the “Manage Kopitiams” button, system will prompt admin to the manage kopitiam page. Admin can edit kopitiam, view the stall and reviews of the kopitiam by clicking on the “Select” button and remove the kopitiam.

Edit

Please update the following particulars:
Kopitiam ID: 42 Disown Kopitiam

Name:

State:

Address:

Operation Hours: to

Opening Days:

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

Halal:

- No
- Yes

Status:

- In Business
- Closed Down

Picture: No file chosen

Note: Our website has filter system that need time to verify your image is relevant if updating image

Admin can edit the information of the kopitiam by clicking on the “Edit” button beside the kopitiam. Done editing can click on the “Update” button to update the latest information.

Go back

Welcome Dylan [Account Setting](#) [Logout](#)

Kopitiam Management System Pro

The Operation Week has been changed successful

Your Kopitiam: Filter

<u>ID</u>	<u>Name</u>	<u>State</u>	<u>Address</u>	<u>Operation Hours</u>	<u>Operation Week</u>	<u>Halal Status</u>	<u>Image</u>	<u>Edit</u>	<u>Stalls</u>	<u>Owner</u>
41	Sin Nam Huat	Johor	22, Jalan Gooair, 11500	From 12:00 To 15:00	Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	Yes In Business		<input type="button" value="Edit"/> <input type="button" value="Select"/> <input type="button" value="Remove"/>		
42	Sin Teong Nam	Johor	29, Jalan Teong, 44500	From 18:00 To 22:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	No In Business		<input type="button" value="Edit"/> <input type="button" value="Select"/> <input type="button" value="Remove"/>		
43	818 Best Coffee Shop	Johor	818, Jalan Coffee, 83477	From 09:00 To 12:00	Wednesday, Thursday, Friday, Saturday, Sunday	Yes In Business		<input type="button" value="Edit"/> <input type="button" value="Select"/> <input type="button" value="Remove"/>		
44	Keat Seng	Kedah	78, Jalan Keat, 83478	From 12:00 To 24:00	Monday, Wednesday, Thursday, Friday, Saturday, Sunday	No In Business		<input type="button" value="Edit"/> <input type="button" value="Select"/> <input type="button" value="Remove"/>		

The Sin Teong Nam kopitiam had successful updated opening days from Monday to Sunday.

View Kopitiam Reviews, Stalls & Stall Reviews of the Kopitiam

Go back

Welcome Dylan Account Setting Logout

Kopitiam Management System Pro

Kopitiam Name: Sin Teong Nam		Kopitiam Reviews																	
Add Stall		Operation Hours	Operation Days																
ID	Name	Food	FoodCategory																
10	Penang Wan Tan Mee	From 18:00 To 22:00	Wan Tan Mee Noodle																
			Image																
		Edit	Review																
Review For Your Kopitiam: <table border="1"> <thead> <tr> <th>Name</th> <th>Comment</th> <th>Date</th> <th>Overall Rating</th> <th>Food</th> <th>Hygiene</th> <th>Service</th> <th>Value</th> </tr> </thead> <tbody> <tr> <td>Bob</td> <td>Food is nice !!!</td> <td>23-08-2020</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> <td>5</td> </tr> </tbody> </table>				Name	Comment	Date	Overall Rating	Food	Hygiene	Service	Value	Bob	Food is nice !!!	23-08-2020	5	5	5	5	5
Name	Comment	Date	Overall Rating	Food	Hygiene	Service	Value												
Bob	Food is nice !!!	23-08-2020	5	5	5	5	5												

Review button
Edit button

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Admin click on the “Select” button will prompt to manage the stall page. The list of stalls and kopitiam review will show to the admin.

Go back

Welcome Dylan Account Setting Logout

Kopitiam Management System Pro

Please update the following particulars:

Stall ID: 10 [Remove Stall](#)

Name: Penang Wan Tan Mee

Food: All Category Wan Tan Mee

Operation Hours: 16:00 to 22:00

Opening Days:

- Monday
- Tuesday
- Wednesday
- Thursday
- Friday
- Saturday
- Sunday

Picture: [Choose File](#) No file chosen

[Update](#) [Cancel](#)

[Go back](#)Welcome Dylan [Account Setting](#)[Logout](#)

Operation days has been changed succesful

Kopitiam Name:Sin Teong Nam [Kopitiam Reviews](#)[Add Stall](#)

Id	Name	Operation Hours	Operation Days	Food	FoodCategory	Image	Edit	Review
10	Penang Wan Tan Mee	From 18:00 To 22:00	Monday,Tuesday,Wednesday,Thursday,Friday,Saturday,Sunday	Wan Tan Mee	Noodle		Select	Review

Review For Your Kopitiam:

Name	Comment	Date	Overall Rating	Food	Hygiene	Service	Value
Bob	Food is nice ! ! !	23-08-2020	5	5	5	5	5

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[Click here to suggest!](#)[Click here to learn more about Kopitiam Management System Pro](#)

Admin can edit the stall information by clicking on the “Select” button beside the stall image. While done editing, the admin needs to click on the “Update” button. Admin also can remove the stall at the edit stall page by clicking on the button “Remove Stall”.

General Suggestions

Checkbox used to select suggestions

These are general suggestions suggested by users that has not been read.

To mark a suggestion as "read", click on "edit" and then on "update"

View all suggestions

Id	Username	Comment	Date	Status	Select
3	Bob	Test	03/07/2020	Unread	<input checked="" type="checkbox"/>
34	Bob	The user interface can make more beautiful.	23-08-2020	Unread	<input type="checkbox"/>

Select All suggestions button, Invert Selection button & Clear Selection button

Select All **Invert Selection** **Clear Selection**

Mark as Read **Mark as Unread** **Cancel**

Improve Kopitiam Management System Pro by suggesting.

[Click here to suggest](#)

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Mark Suggestion as Read button, Mark Suggestions as Unread button & Cancel button

Admin can click on the button “Review General Suggestions” on the admin portal page to prompt to review the general suggestion page. In the review general suggestions page, a list of suggestions suggested by the user will show to admin. Admin can select the suggestion by click on the checkbox beside the suggestion and take action such as mark as read, mark as unread and cancel.

Select All suggestions button, Invert Selection button & Clear Selection button

Select All **Invert Selection** **Clear Selection**

Mark as Read **Mark as Unread** **Cancel**

These are general suggestions suggested by users that has not been read.

To mark a suggestion as "read", click on "edit" and then on "update"

View all suggestions

Id	Username	Comment	Date	Status	Select
3	Bob	Test	03/07/2020	Unread	<input checked="" type="checkbox"/>
34	Bob	The user interface can make more beautiful.	23-08-2020	Unread	<input type="checkbox"/>

Suggestions successfully marked as read. The people who suggested the suggestion has been notified via email that their suggestion(s) has been approved.

Mark as Read **Mark as Unread** **Cancel**

Improve Kopitiam Management System Pro by suggesting.

[Click here to suggest](#)

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[Click here to learn more about Kopitiam Management System Pro](#)

Suggestions that approve or read by admin, system will show to admin a message that notify admin the people who suggest that suggestion had been notified and sent email to notice that people about his or her suggestion has been approved.

Review Kopitiam Suggestions



The screenshot shows a web-based application titled "Kopitiam Management System Pro". At the top right, there are links for "Welcome Dylan", "Account Setting", and "Logout". On the left, there is a "Go back" button. The main content area displays a table titled "List of pending kopitiam suggestions". The table includes a "View all suggestions" link at the top. The columns are labeled: Id, UserId, StateId, Name, OpHourSt, OpHourEn, OpDayOfWeek, Date, Halal, Status, Address, Image, and Select. There are three rows of data:

Id	UserId	StateId	Name	OpHourSt	OpHourEn	OpDayOfWeek	Date	Halal	Status	Address	Image	Select
29	3	1	Golden City	15:00	21:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	18-08-2020	0	Pending	Jalan Ayer Itam		<input type="checkbox"/>
30	3	1	Da Jiexi Cafe	15:00	21:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday	18-08-2020	1	Pending	Jalan Ayer Itam		<input type="checkbox"/>
31	3	1	Restoran Ee Tong	15:00	21:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	18-08-2020	0	Pending	Jalan Zoo		<input type="checkbox"/>

By clicking on the “Review Kopitiam Suggestions” button, a pending list of kopitiam suggestions will show to admin.

36	3	9	Fatt Kee	12:00	24:00	Monday, Tuesday, Wednesday, Thursday, Friday, Sunday	18-08-2020	0	Pending	Jalan Paya Terubong		<input type="checkbox"/>
37	3	9	Restoran Tunas	12:00	18:00	Monday, Tuesday, Wednesday, Thursday, Sunday	18-08-2020	1	Pending	Jalan Paya Terubong		<input type="checkbox"/>
38	3	9	1997	12:00	15:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	18-08-2020	0	Pending	Jalan Paya Terubong		<input checked="" type="checkbox"/>

1 2 3 4

Approve Selected Kopitiam button, Reject Selected Kopitiam button, Mark Selected Kopitiam as Pending & Cancel

Select All Invert Selection Clear Selection

Select All Kopitiam Suggestions, button, Invert Selection button & Clear Selection button

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Admin can take action on the selected kopitiam by clicking on the checkbox beside the picture of kopitiam. Admin can approve the kopitiam, reject the kopitiam and mark it as pending.

54		Hao Xian Wei	Farlim	19:00	23:00	Monday, Tuesday, Wednesday, Thursday, Friday, Sunday	<input type="button" value="Select"/>
55		1997	Jalan Paya Terubong	12:00	15:00	Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday	<input type="button" value="Select"/>

Approved Kopitiam added to Home Page

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The kopitiam approved by the admin will show at the home page.

Review Stall Suggestions

The screenshot shows the Kopitiam Management System Pro admin portal. At the top right, it says "Welcome Dylan" with "Account Setting" and "Logout" links. The main content area is titled "List of pending kopitiam suggestions: View all suggestions". Below this is a table with columns: Id, UserId, StateId, KopitiamName, Name, OpHourSt, OpHourEn, OpDayOfWeek, FoodId, FoodName, Date, Halal, Status, and Image. A single row is shown: Id 125, UserId 42, StateId Sin Teong Nam, Name Penang Wan Tan Mee, OpHourSt 18:00, OpHourEn 22:00, OpDayOfWeek 20, FoodId 20, FoodName Wan Tan Mee, Date 23-08-2020, Halal 0, Status Pending, and an image thumbnail. Below the table are buttons: "Select All", "Invert Selection", "Clear Selection", "Approve Selected", "Reject Selected", "Mark as Pending", and "Cancel". At the bottom left is a link "Click here to suggest" and at the bottom right is a link "Click here to learn more about Kopitiam Management System Pro".

The button “Review Stall Suggestions” at the admin portal page can prompt admin to review stall suggestions page. The page will show a list of stalls suggested by the user.

This screenshot is similar to the one above, but it highlights the "Select" checkbox for the first stall in the table with a red box and arrow. The rest of the interface is identical, including the table data, buttons, and footer links.

Admin can take action of the stall such as approve, reject and mark as pending.

Kopitiam Id: 42

Name: Sin Teong Nam

State: Johor

Address: 29, Jalan Teong, 44500
[View in Google Map](#)

Opening Hours: 18:00 to 22:00

Days Open: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday

Halal: No

Stalls

Stall Name	Opening Hours	Notes
Penang Wan Tan Mee	18:00 to 22:00	Penang Wan Tan Mee

Approved stall added to kopitiam

Stall missing? Suggest today missing stall(s)

The stall approved by admin will show at the kopitiam where user wish to add the stall.

Send Postcard

Welcome Dylan [Account Setting](#) [Logout](#)

This is a list of user(s) awaiting for their claim of ownership to be approved.

<input type="checkbox"/>	View all suggestions	Id	User Name	Kopitiam Id	Date	Status	Code	Select
<input checked="" type="checkbox"/>		25	Wei	65	27-08-2020	Unread	65-269810	<input checked="" type="checkbox"/>

Checkbox used to select user

Unfortunately, for the time being, we cannot send post card(s). Please instead send an email to the users by selecting from the above rows and then clicking on the send email button.

[Send Email](#) [Send Email button](#)

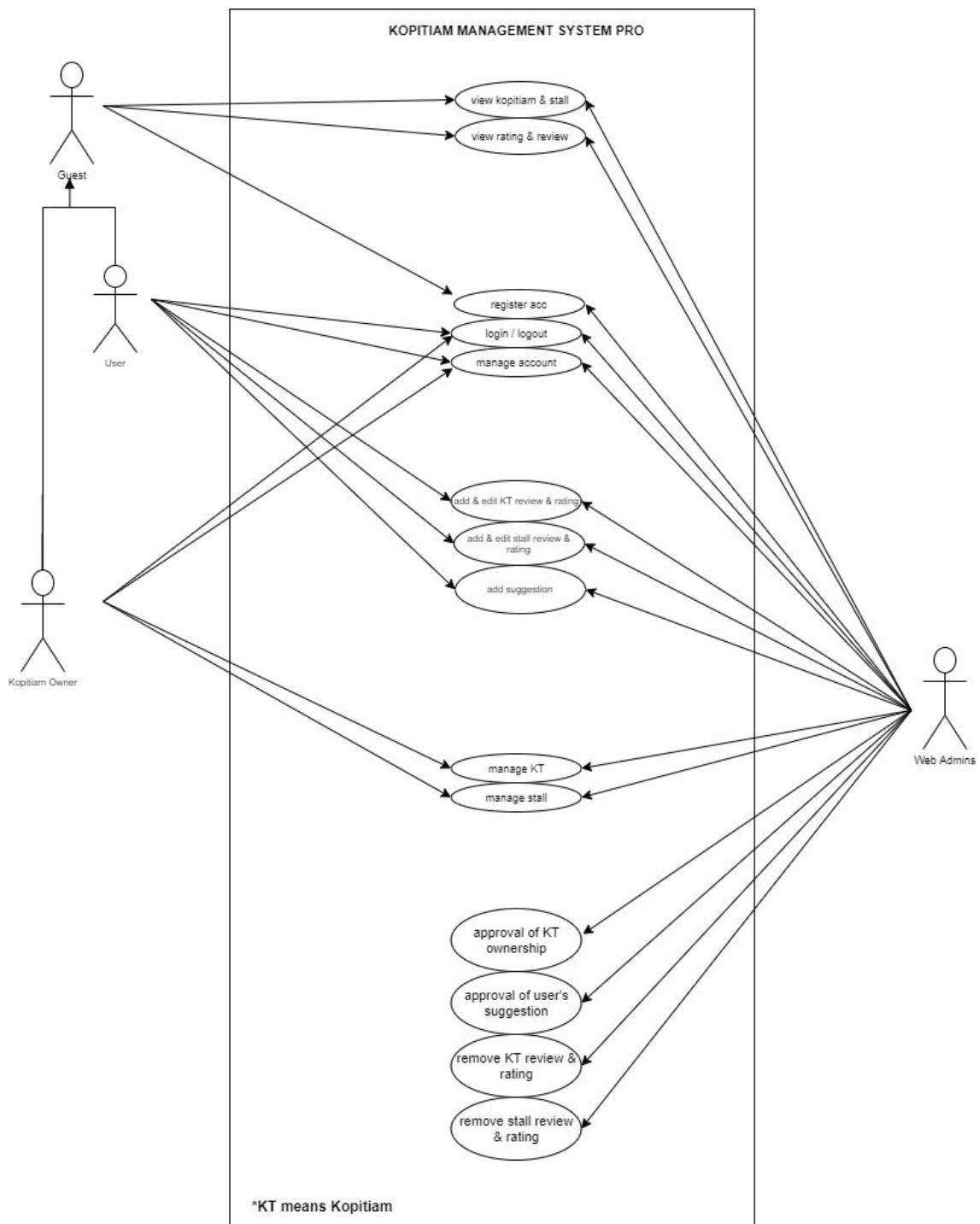
Improve Kopitiam Management System Pro by suggesting. [Click here to suggest](#)

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Admin can send an email to the user who applies to become an owner to a kopitiam. Admin can click on the checkbox to select a user and send email to him or her.

APPENDICES

Appendix A : Use-Case Diagram



Appendix B1 : View kopitiam & stall (Use-Case Description)

USE CASE DESCRIPTION (view kopitiam & stall)

Use Case	View kopitiam & stall
Summary	This use case deals with guest, user and kopitiam owner viewing kopitiam & stall in the system.
Actor	Guest, User ,Kopitiam Owner
Trigger	Users with or without account can still be able to use the system to view kopitiam & stall.
Primary Scenario	<ol style="list-style-type: none"> 1. Users uses the system to view kopitiam & stall. [Alternative: System prompt user to log in to their existing account.] 2. System check for search request made by users. 3. System confirms the search request. [Exceptional: New user without an account in the system.] 4. System displays the search request. 5. The use case terminates.
Alternative Scenario	<p>System prompt user to log in to their existing account</p> <ol style="list-style-type: none"> 1. System searches the database regarding user's information. 2. System confirms with user regarding their details is up-to-date. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>New user without an account in the system</p> <ol style="list-style-type: none"> 1. System indicates that the user does not have any account. 2. System guides user to register a new account. 3. The primary scenario continues from step 4.
Pre-Conditions	<ol style="list-style-type: none"> 1. An existing user or new user has decided to view the kopitiam & stall in system 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Users must be able to view kopitiam and stall in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B2 : View review & rating (Use-Case Description)

USE CASE DESCRIPTION (view rating & review)

Use Case	View rating & review
Summary	This use case deals with guest, user and kopitiam owner viewing rating & review of kopitiam/stall in the system.
Actor	Guest, User, Kopitiam Owner
Trigger	Users with or without account will still be able to use the system to view kopitiam/stall's rating and review
Primary Scenario	<ol style="list-style-type: none"> 1. Users use the system to view kopitiam/stall's rating & review. [Alternative: System prompt user to log in to their existing account.] 2. System check for search request made by users. 3. System confirms the search request. [Exceptional: New user without an account in the system.] 4. System displays the search request. 5. The use case terminates.
Alternative Scenario	System prompt user to log in to their existing account <ol style="list-style-type: none"> 1. System searches the database regarding user's information. 2. System confirms with user regarding their details is up-to-date. 3. The primary scenario continues from step 2.
Exceptional Scenario	New user without an account in the system <ol style="list-style-type: none"> 1. System indicates that the user does not have any account. 2. System guides user to register a new account. 3. The primary scenario continues from step 4.
Pre-Conditions	<ol style="list-style-type: none"> 1. An existing user or new user has decided to view the kopitiam/ stall's rating & review in system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Users must be able to view kopitiam/ stall's rating & review in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B3 : Register account (Use-Case Description)

USE CASE DESCRIPTION (register acc)

Use Case	Register account
Summary	This use case deals with guest, user, kopitiam owner & web admins that enables them to register a new account in the system.
Actor	Guest, User, Kopitiam Owner, Web Admins
Trigger	All types of user can trigger this system to create & register an account based on their respective position.
Primary Scenario	<ol style="list-style-type: none"> 1. Users use the system and tries to create and register an account in the system. [Alternative: System prompt user to fill up all the empty columns as all information is required to proceed.] 2. System checks the information input by the user. [Exceptional: User input information/detail that has duplication or invalid.] 3. System displays the success of creating & registering the account. 4. The use case terminates.
Alternative Scenario	<p>System prompt user to fill up all the empty columns as all information is required to proceed.</p> <ol style="list-style-type: none"> 1. System checks through all the columns for user to input information. 2. System ensures that all columns are filled with information. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>User input information/detail that has duplication or invalid</p> <ol style="list-style-type: none"> 1. System indicates that the user has input invalid information. 2. System prompts user to edit the input with valid information. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. A user has decided to create & register an account in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Users must be able to create & register an account in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B4 : Login/logout (Use-Case Description)

USE CASE DESCRIPTION (login/logout)

Use Case	Login / Logout
Summary	This use case deals with user, kopitiam owner & web admins that allows them to login / logout of their account in the system.
Actor	User, Kopitiam Owner, Web Admins
Trigger	User, Kopitiam Owner & Web Admins can trigger this system to login/logout an account based on their respective position.
Primary Scenario	<ol style="list-style-type: none"> Users uses the system and tries to login/logout an account in the system. [Alternative: System prompt user to fill up the username & password column as it is required to proceed.] System checks the information input by the users. [Exceptional: User login input has invalid username or password.] System displays the success of logging in / logging out of the account. The use case terminates.
Alternative Scenario	<p>System prompt user to fill up all the username & password column as it is required to proceed.</p> <ol style="list-style-type: none"> System checks through all the columns for user to input information. System ensures that all columns are filled with information. The primary scenario continues from step 2.
Exceptional Scenario	<p>User login input has invalid username or password</p> <ol style="list-style-type: none"> System indicates that the user has input invalid information. System prompts user to edit the input with valid information. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> A user has decided to create & register an account in the system. System must have personal Login ID and password. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> User's database must be up-to-date. Users must be able to login/logout their account in the system. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> System is responsive and functioning well. Users are satisfied when using this system. System must be easy to use by users of all age group.

Appendix B5 : Manage account (Use-Case Description)

USE CASE DESCRIPTION (manage account)

Use Case	Manage account
Summary	This use case deals with user, kopitiam owner & web admins that allows them to manage their account in the system.
Actor	User, Kopitiam Owner, Web Admins
Trigger	User, Kopitiam Owner & Web Admins can trigger this system to create & register an account based on their respective position.
Primary Scenario	<ol style="list-style-type: none"> 1. Users use the system and tries to manage their account in the system. [Alternative: System prompt user to fill up all the empty columns as all information is required to proceed.] 2. System checks the information input by the users. [Exceptional: User input information/detail that has duplication or invalid.] 3. System displays the success of editing the account. 4. The use case terminates.
Alternative Scenario	<p>System prompt user to fill up all the empty columns as all information is required to proceed.</p> <ol style="list-style-type: none"> 1. System checks through all the columns for user to input information. 2. System ensures that all columns are filled with information. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>User input information/detail that has duplication or invalid</p> <ol style="list-style-type: none"> 1. System indicates that the user has input invalid information. 2. System prompts user to edit the input with valid information. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. Users has decided to make amendment to their account in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Users must be able to manage their account in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B6 : Add & edit Kopitiam review & rating (Use-Case Description)

USE CASE DESCRIPTION (add & edit KT review & rating)

Use Case	Add & edit Kopitiam review & rating
Summary	This use case deals with user that enables them to add & edit kopitiam review & rating in the system.
Actor	User
Trigger	User can trigger this system to add & edit kopitiam review & rating.
Primary Scenario	<ol style="list-style-type: none"> 1. User uses the system and tries to add & edit review and rating of kopitiam in the system. [Alternative: System prompt user to fill up if either one of the rating or review column is left empty.] 2. System checks the information input by the user. [Exceptional: User input information/detail that has duplication or invalid.] 3. System displays the success of adding or editing the review & rating of the kopitiam. 4. The use case terminates.
Alternative Scenario	<p>System prompt user to fill up if either one of the rating or review column is left empty.</p> <ol style="list-style-type: none"> 1. System checks through all the columns for user to input information. 2. System ensures that all columns are filled with information. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>User input information/detail that has duplication or invalid</p> <ol style="list-style-type: none"> 1. System indicates that the user has input invalid information. 2. System prompts user to edit the input with valid information. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. User has decided to add or edit the review & rating of kopitiam in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. User must be able to add & edit the review & rating of kopitiam in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B7 : Add & edit stall review & rating (Use-Case Description)

USE CASE DESCRIPTION (add & edit stall review & rating)

Use Case	Add & edit stall review & rating
Summary	This use case deals with user that enables them to add & edit stall review & rating in the system.
Actor	User
Trigger	User can trigger this system to add & edit stall review & rating.
Primary Scenario	<ol style="list-style-type: none"> 1. User uses the system and tries to add & edit review and rating of stall in the system. [Alternative: System prompt user to fill up if either one of the rating or review column is left empty.] 2. System checks the information input by the user. [Exceptional: User input information/detail that has duplication or invalid.] 3. System displays the success of adding or editing the review & rating of the stall. 4. The use case terminates.
Alternative Scenario	<p>System prompt user to fill up if either one of the rating or review column is left empty.</p> <ol style="list-style-type: none"> 1. System checks through all the columns for user to input information. 2. System ensures that all columns are filled with information. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>User input information/detail that has duplication or invalid</p> <ol style="list-style-type: none"> 1. System indicates that the user has input invalid information. 2. System prompts user to edit the input with valid information. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. User has decided to add or edit the review & rating of stall in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. User must be able to add & edit review of the stall in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B8 : Add suggestion (Use-Case Description)

USE CASE DESCRIPTION (add suggestion)

Use Case	Add Suggestion
Summary	This use case deals with user that enables them to add suggestion in the system.
Actor	User
Trigger	User can trigger this system to add suggestion.
Primary Scenario	<ol style="list-style-type: none"> 1. User uses the system and tries to add suggestion in the system. [Alternative: System prompt user to fill up if it is left empty.] 2. System checks the information input by the user. [Exceptional: User input contains something offensive or invalid.] 3. System displays the success of adding suggestion into the system. 4. The use case terminates.
Alternative Scenario	<p>System prompt user to fill up if it is left empty.</p> <ol style="list-style-type: none"> 1. System checks through all the columns for user to input information. 2. System ensures that all columns are filled with information. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>User input contains something offensive or invalid</p> <ol style="list-style-type: none"> 1. System indicates that the user has input invalid information. 2. System prompts user to edit the input with valid information. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. User has decided to add suggestion in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. User must be able to add suggestion in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B9 : Manage kopitiam (Use-Case Description)

USE CASE DESCRIPTION (manage KT)

Use Case	Manage kopitiam
Summary	This use case deals with kopitiam owner & web admin that enables them to manage kopitiam in the system.
Actor	Kopitiam Owner, Web Admin
Trigger	Kopitiam owner & Web Admin can trigger this system to manage kopitiam.
Primary Scenario	<ol style="list-style-type: none"> 1. Kopitiam owner & web admin uses the system to manage the kopitiam info such as add, edit & remove kopitiam. [Alternative: System prompt user to add image if there is any picture that they would like to add.] 2. System checks the information input by the kopitiam owner or web admins. [Exceptional: Input contains something irrelevant information.] 3. System displays the success of managing kopitiam. 4. The use case terminates.
Alternative Scenario	System prompt user to add image if there is any picture that they would like to add. <ol style="list-style-type: none"> 1. System checks if there is any image added. 2. System ensures that the image file size does not exceed the limit of file size. 3. The primary scenario continues from step 2.
Exceptional Scenario	Input contains something irrelevant information. <ol style="list-style-type: none"> 1. System indicates that the user has input irrelevant information. 2. System prompts user to edit the input with relevant information. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. Kopitiam owner or Web Admin has decided to manage kopitiam in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Kopitiam owner or Web Admin must be able to manage kopitiam in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B10 : Manage stall (Use-Case Description)

USE CASE DESCRIPTION (manage stall)

Use Case	Manage stall
Summary	This use case deals with Kopitiam owner & web admin that enables them to manage stall in the system.
Actor	Kopitiam Owner, Web Admin
Trigger	Kopitiam owner & Web Admin can trigger this system to manage stall.
Primary Scenario	<ol style="list-style-type: none"> 1. Kopitiam owner & web admin uses the system to manage the stall info such as add, edit & remove stall. [Alternative: System prompt user to add image if there is any picture that they would like to add.] 2. System checks the information input by the kopitiam owner or web admins. [Exceptional: Input contains something irrelevant information.] 3. System displays the success of managing stall. 4. The use case terminates.
Alternative Scenario	System prompt user to add image if there is any picture that they would like to add. <ol style="list-style-type: none"> 1. System checks if there is any image added. 2. System ensures that the image file size does not exceed the limit of file size. 3. The primary scenario continues from step 2.
Exceptional Scenario	Input contains something irrelevant information. <ol style="list-style-type: none"> 1. System indicates that the user has input irrelevant information. 2. System prompts user to edit the input with relevant information. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. Kopitiam owner or Web Admin has decided to manage stall in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Kopitiam owner or Web Admin must be able to manage stall in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B11 : Approval of kopitiam ownership (Use-Case Description)

USE CASE DESCRIPTION (approval of KT ownership)

Use Case	Approval of kopitiam ownership
Summary	This use case deals with Web Admin that enables them to approve the ownership of kopitiam owner in the system.
Actor	Web Admin
Trigger	Web Admin can trigger this system to approve the ownership of kopitiam owner.
Primary Scenario	<ol style="list-style-type: none"> 1. Web admin uses the system to approve the ownership of kopitiam owner. [Alternative: System checks if the kopitiam owner has submitted all the documents needed to get the approval.] 2. System verify the information input by the kopitiam owner. [Exceptional: Document submitted does not meet the requirement.] 3. System displays the success of approving the kopitiam ownership to web admin & kopitiam owner. 4. The use case terminates.
Alternative Scenario	<p>System checks if the kopitiam owner has submitted all the documents needed to get the approval.</p> <ol style="list-style-type: none"> 1. System checks documents are submitted. 2. System ensures that all documents are submitted. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>Documents submitted does not meet the requirement.</p> <ol style="list-style-type: none"> 1. System indicates that the kopitiam owner has submitted documents that does not meet the requirement. 2. System prompts kopitiam owner to submit and fulfil all the needs. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. Web Admin has decided to approve the ownership of kopitiam ownership in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Web Admin must be able to approve the ownership of kopitiam owner in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B12 : Approval of user's suggestion (Use-Case Description)

USE CASE DESCRIPTION (approval of user's suggestion)

Use Case	Approval of user's suggestion
Summary	This use case deals with Web Admin that enables them to approve the user's suggestion in the system.
Actor	Web Admin
Trigger	Web Admin can trigger this system to approve the user's suggestion.
Primary Scenario	<ol style="list-style-type: none"> 1. Web admin uses the system to approve the user's suggestion. [Alternative: System checks if the user has fill up everything in the suggestion form.] 2. System verify the information input by the user. [Exceptional: Suggestion form submitted contains something offensive or irrelevant.] 3. System displays the success of approving the user's suggestion to web admin & user. 4. The use case terminates.
Alternative Scenario	<p>System checks if the user has fill up everything in the suggestion form.</p> <ol style="list-style-type: none"> 1. System checks suggestion form that are submitted by user. 2. System ensures that suggestion form is completely filled up. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>Suggestion form submitted contains something offensive or irrelevant.</p> <ol style="list-style-type: none"> 1. System indicates that the user has submitted suggestion form that contains offensive messages or irrelevant suggestion 2. System prompts user to make changes and re-submit a new suggestion. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. Web Admin has decided to approve the user's suggestion in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Web Admin must be able to approve the user's suggestion in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B13 : Remove kopitiam review & rating (Use-Case Description)

USE CASE DESCRIPTION (remove KT review & rating)

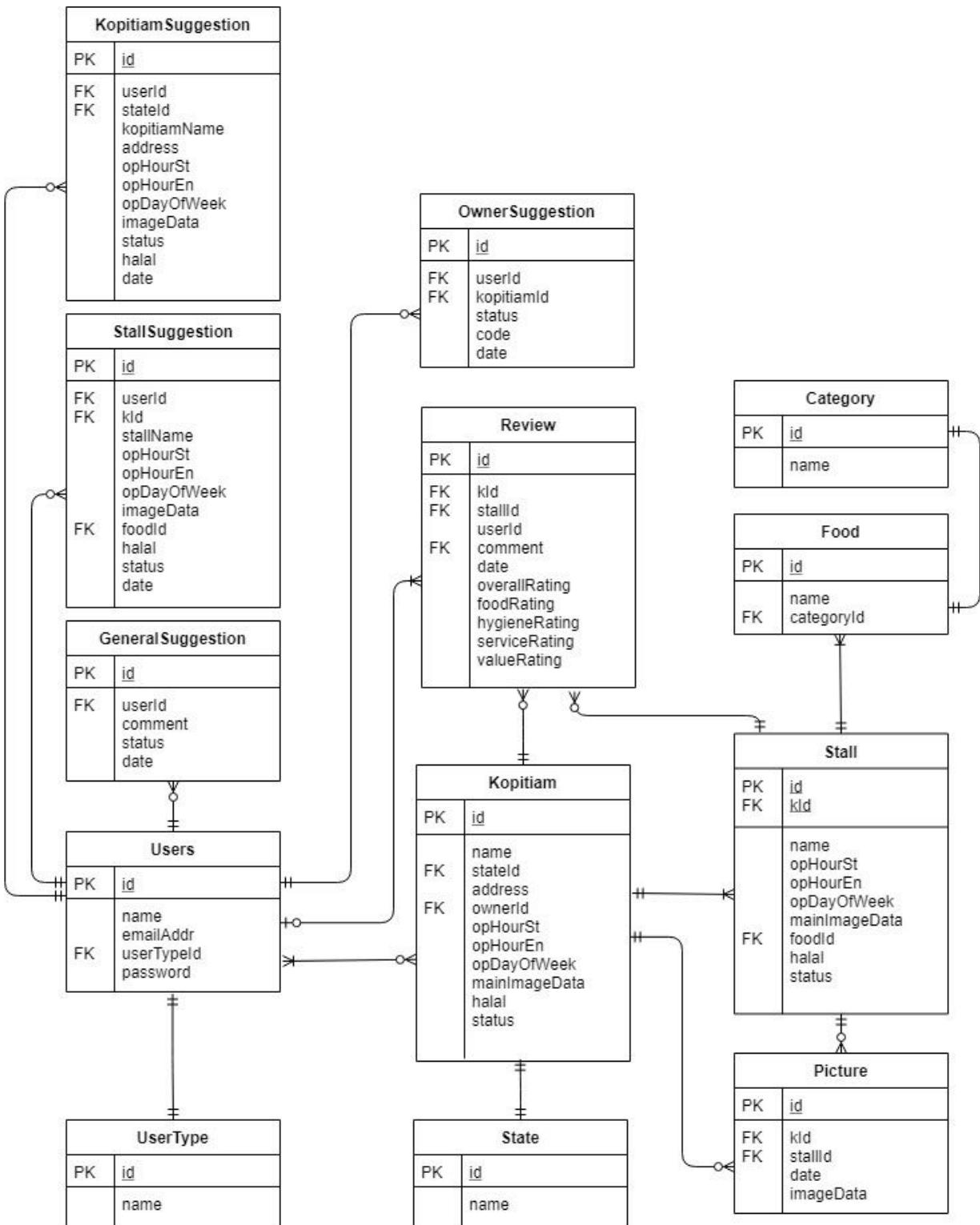
Use Case	Remove kopitiam review & rating
Summary	This use case deals with Web Admin that enables them to remove kopitiam review & rating in the system.
Actor	Web Admin
Trigger	Web Admin can trigger this system to remove kopitiam review & rating given by user.
Primary Scenario	<ol style="list-style-type: none"> 1. Web admin uses the system to remove kopitiam review & rating given by the user. [Alternative: System checks if the user has submitted the review & rating.] 2. System verify the information input by the user in their review & rating. [Exceptional: Review & rating by user is being edited.] 3. System displays the success of removing kopitiam review & rating by user to the web admin. 4. The use case terminates.
Alternative Scenario	<p>System checks if the user has submitted the review & rating.</p> <ol style="list-style-type: none"> 1. System checks review & rating. 2. System ensures that the review & rating are submitted. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>Review & rating by user is being edited.</p> <ol style="list-style-type: none"> 1. System checks the status of the review & rating of kopitiam by user. 2. System then waits for the user to complete their amendments & waiting for web admin's action. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. Web Admin has decided to remove kopitiam review & rating by user in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Web Admin must be able to remove kopitiam review & rating by user in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

Appendix B14 : Remove stall review & rating (Use-Case Description)

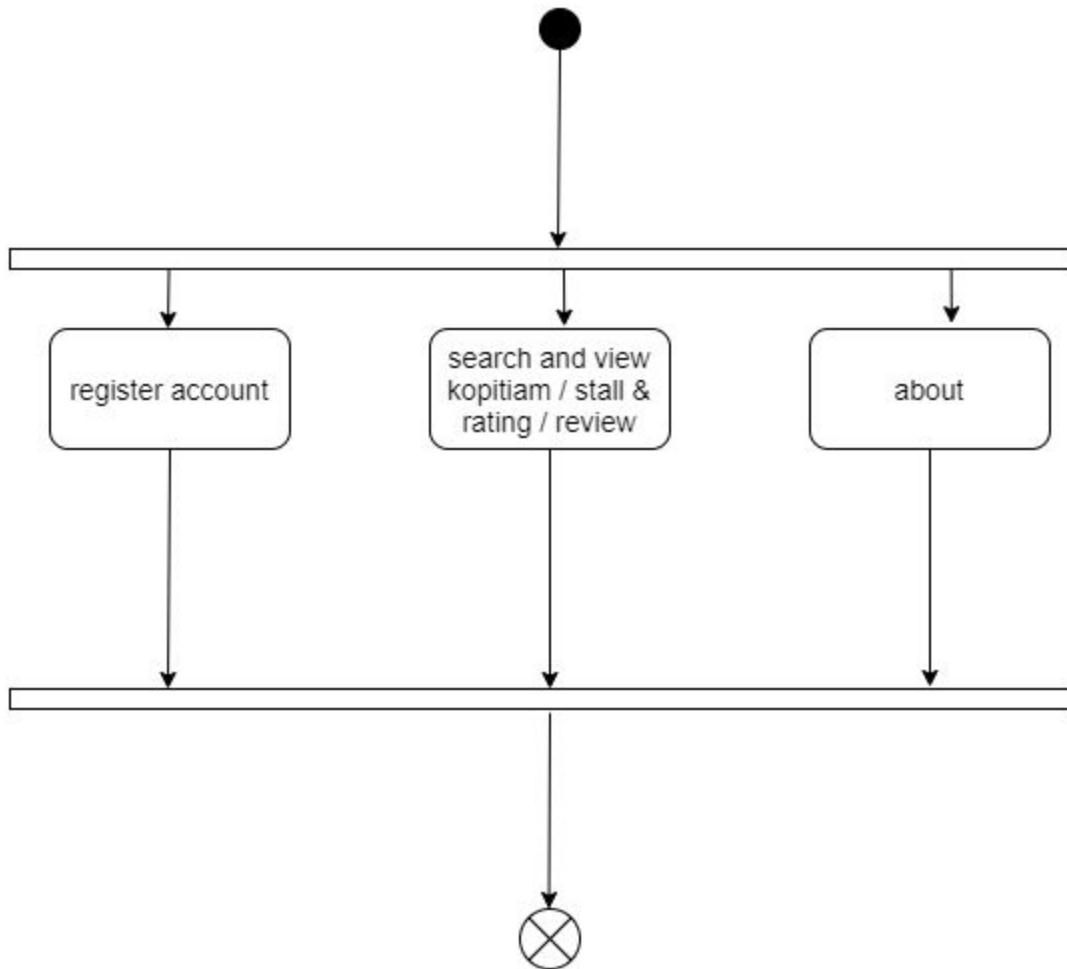
USE CASE DESCRIPTION (remove stall review & rating)

Use Case	Remove stall review & rating
Summary	This use case deals with Web Admin that enables them to remove stall review & rating in the system.
Actor	Web Admin
Trigger	Web Admin can trigger this system to remove stall review & rating given by user.
Primary Scenario	<ol style="list-style-type: none"> 1. Web admin uses the system to remove stall review & rating given by the user. [Alternative: System checks if the user has submitted the review & rating.] 2. System verify the information input by the user in their review & rating. [Exceptional: Review & rating by user is being edited.] 3. System displays the success of removing stall review & rating by user to the web admin. 4. The use case terminates.
Alternative Scenario	<p>System checks if the user has submitted the review & rating.</p> <ol style="list-style-type: none"> 1. System checks review & rating. 2. System ensures that the review & rating are submitted. 3. The primary scenario continues from step 2.
Exceptional Scenario	<p>Review & rating by user is being edited.</p> <ol style="list-style-type: none"> 1. System checks the status of the review & rating of stall by user. 2. System then waits for the user to complete their amendments & waiting for web admin's action. 3. The primary scenario continues from step 3.
Pre-Conditions	<ol style="list-style-type: none"> 1. Web Admin has decided to remove stall review & rating by user in the system. 2. System must have personal Login ID and password. 3. System must be able to guide new user to register a new account.
Post-Conditions	<ol style="list-style-type: none"> 1. User's database must be up-to-date. 2. Web Admin must be able to remove stall review & rating by user in the system. 3. System must be responsive in handling the actions made by users.
Assumptions	<ol style="list-style-type: none"> 1. System is responsive and functioning well. 2. Users are satisfied when using this system. 3. System must be easy to use by users of all age group.

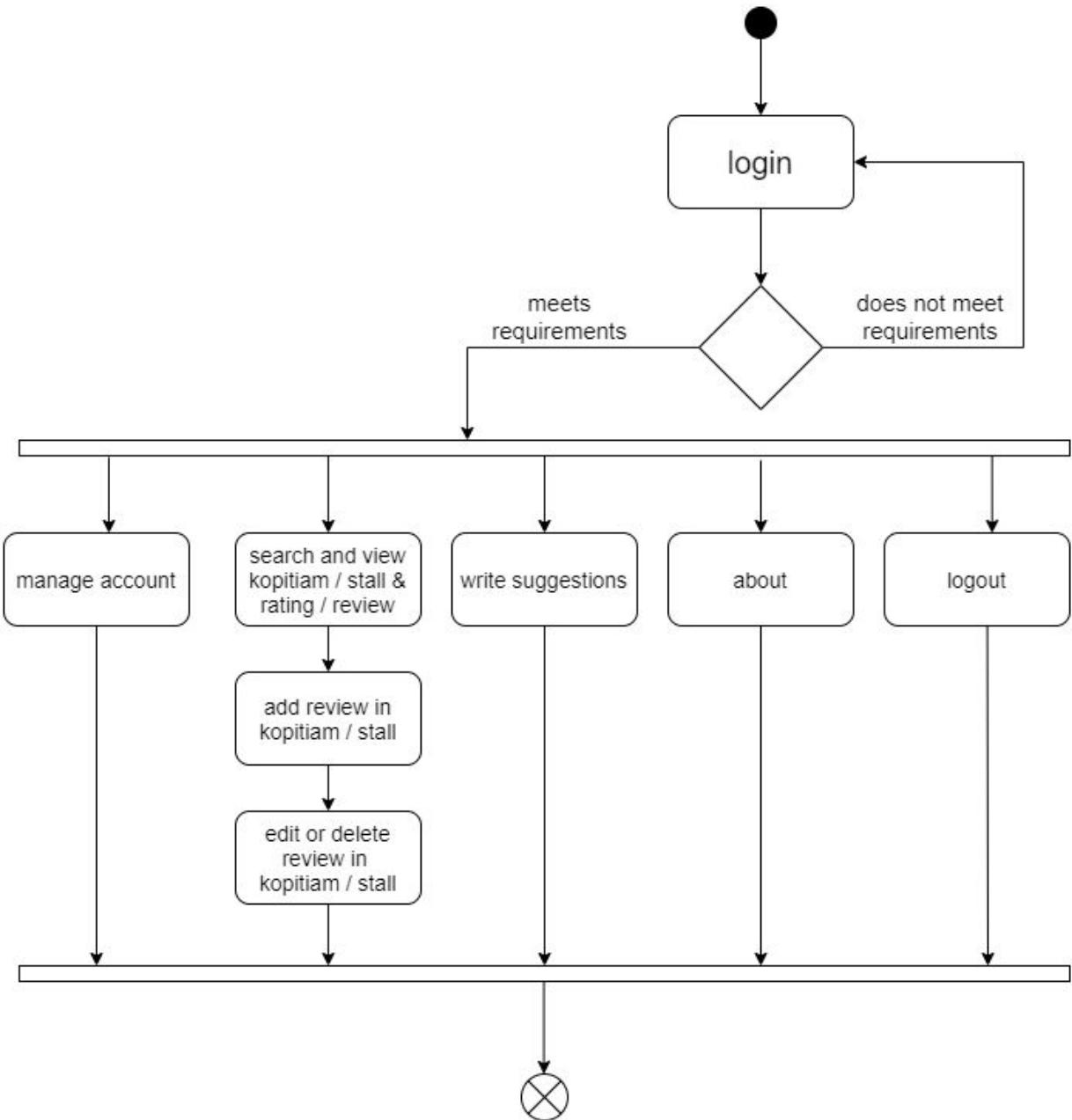
Appendix C : Entity Relationship Diagram (ERD)



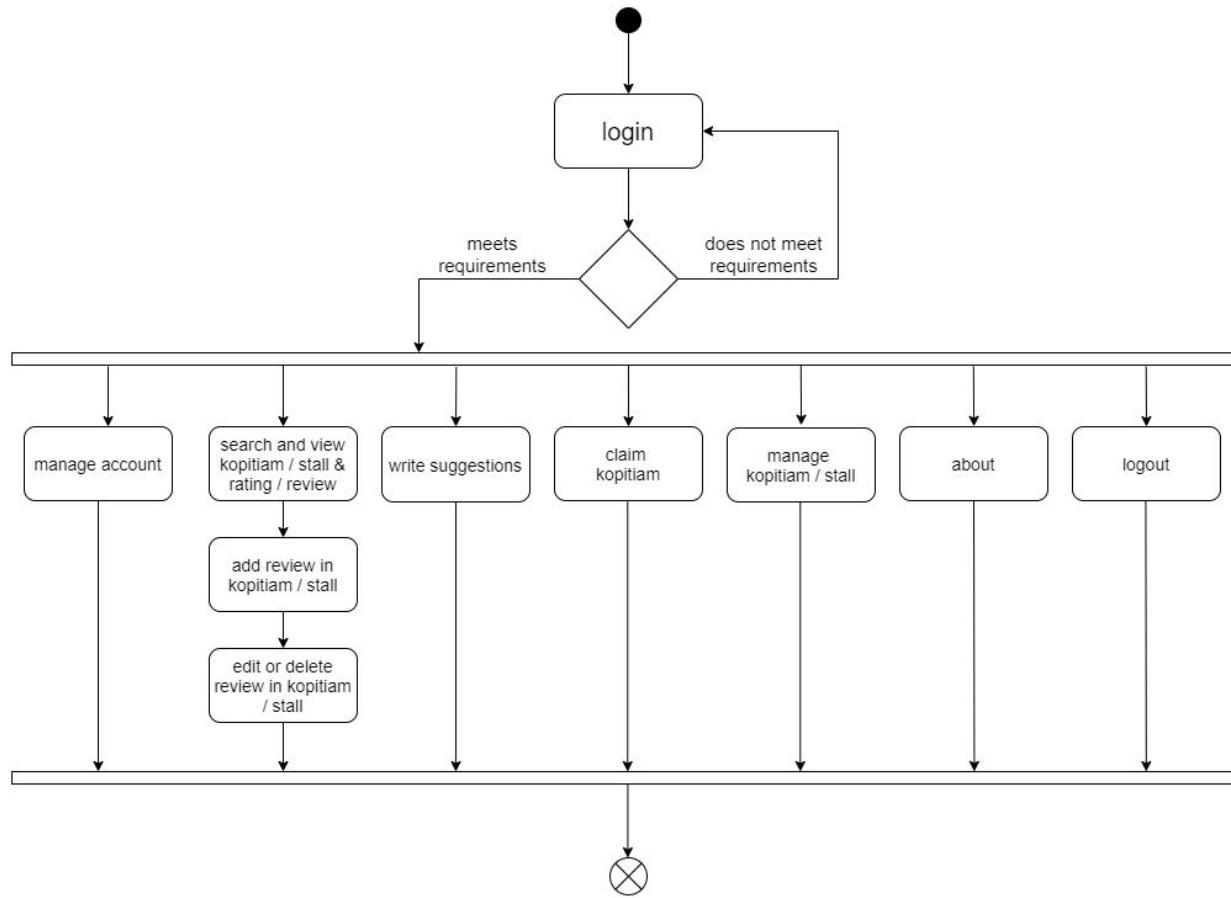
Appendix D1 : Guest Flow Diagram (Activity Diagram)



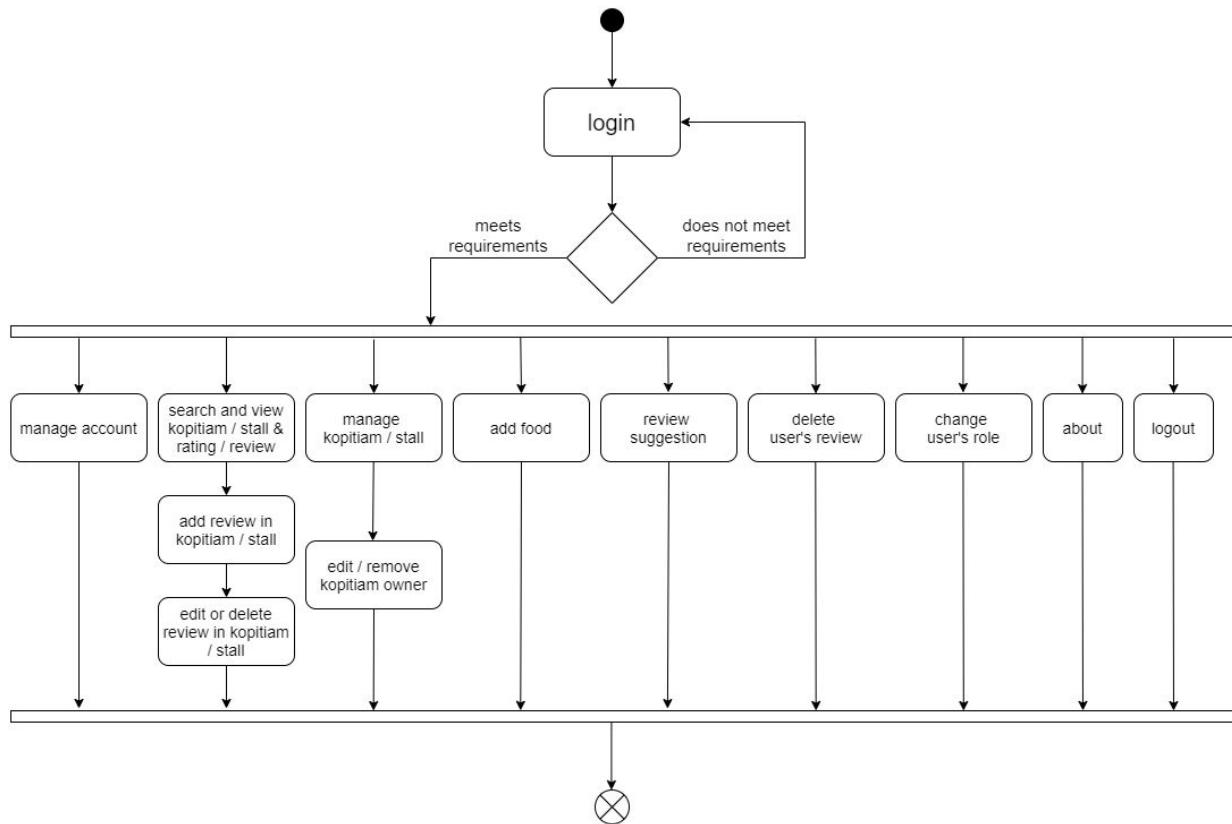
Appendix D2 : Registered User Flow Diagram (Activity Diagram)



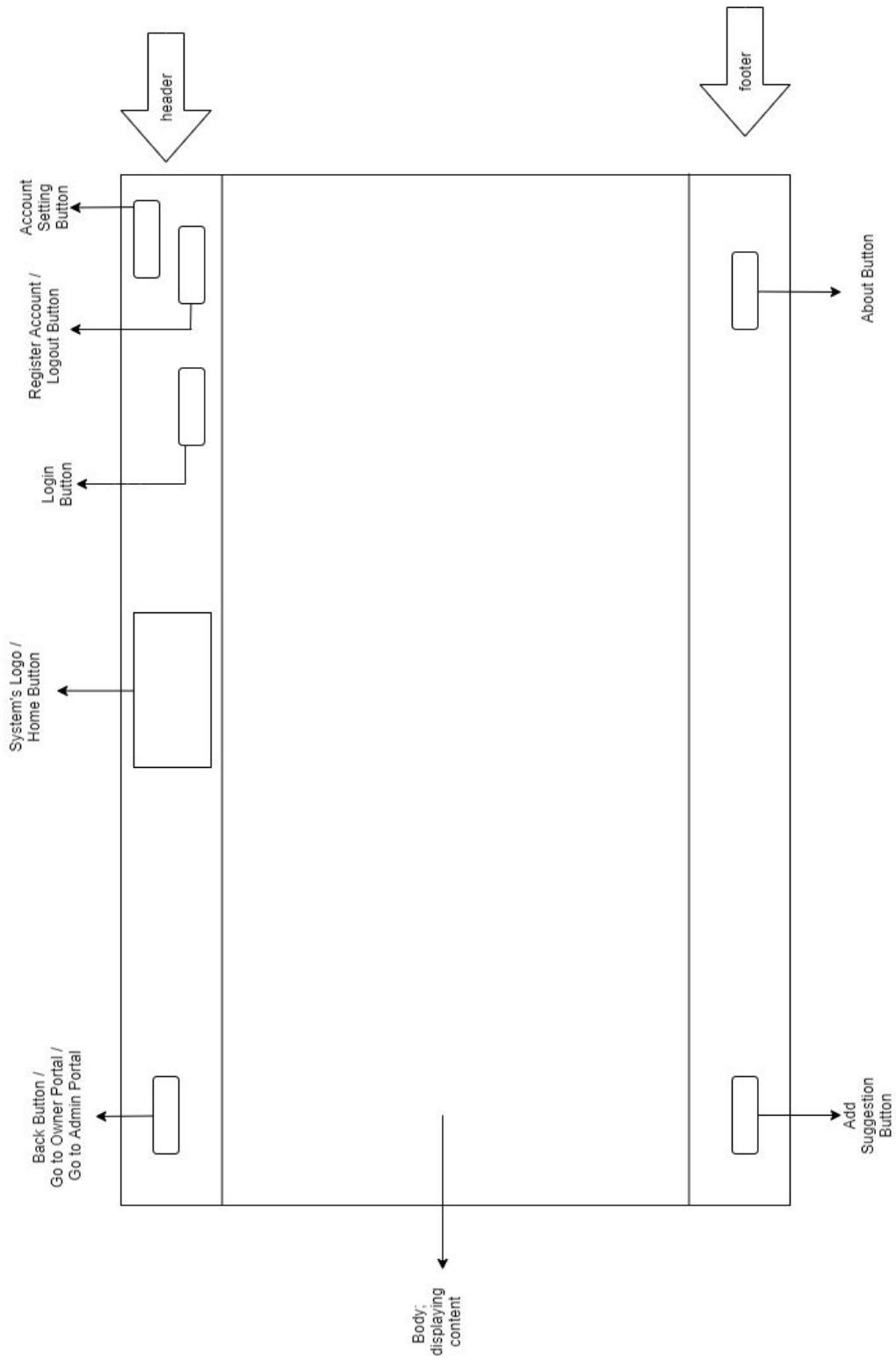
Appendix D3 : Kopitiam Owner Flow Diagram (Activity Diagram)



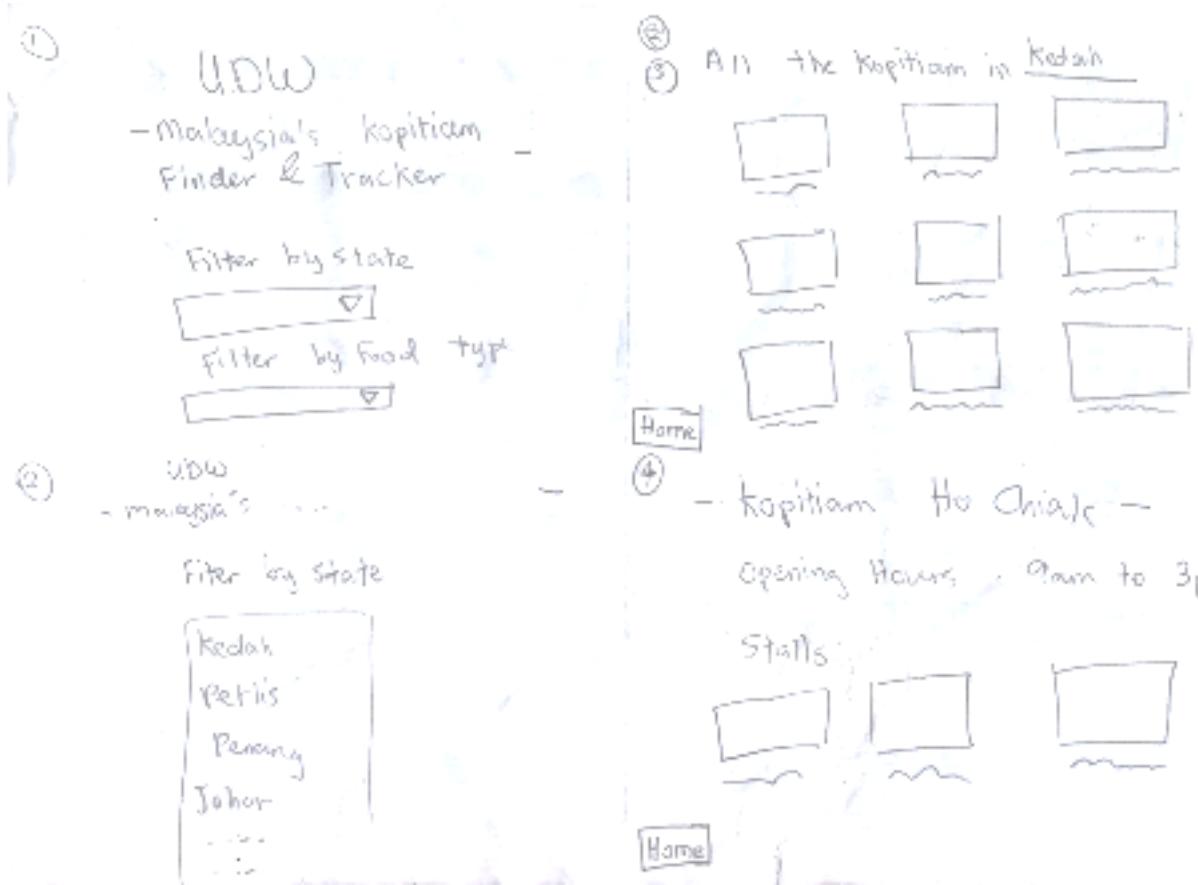
Appendix D4 : Web Admin Flow Diagram (Activity Diagram)



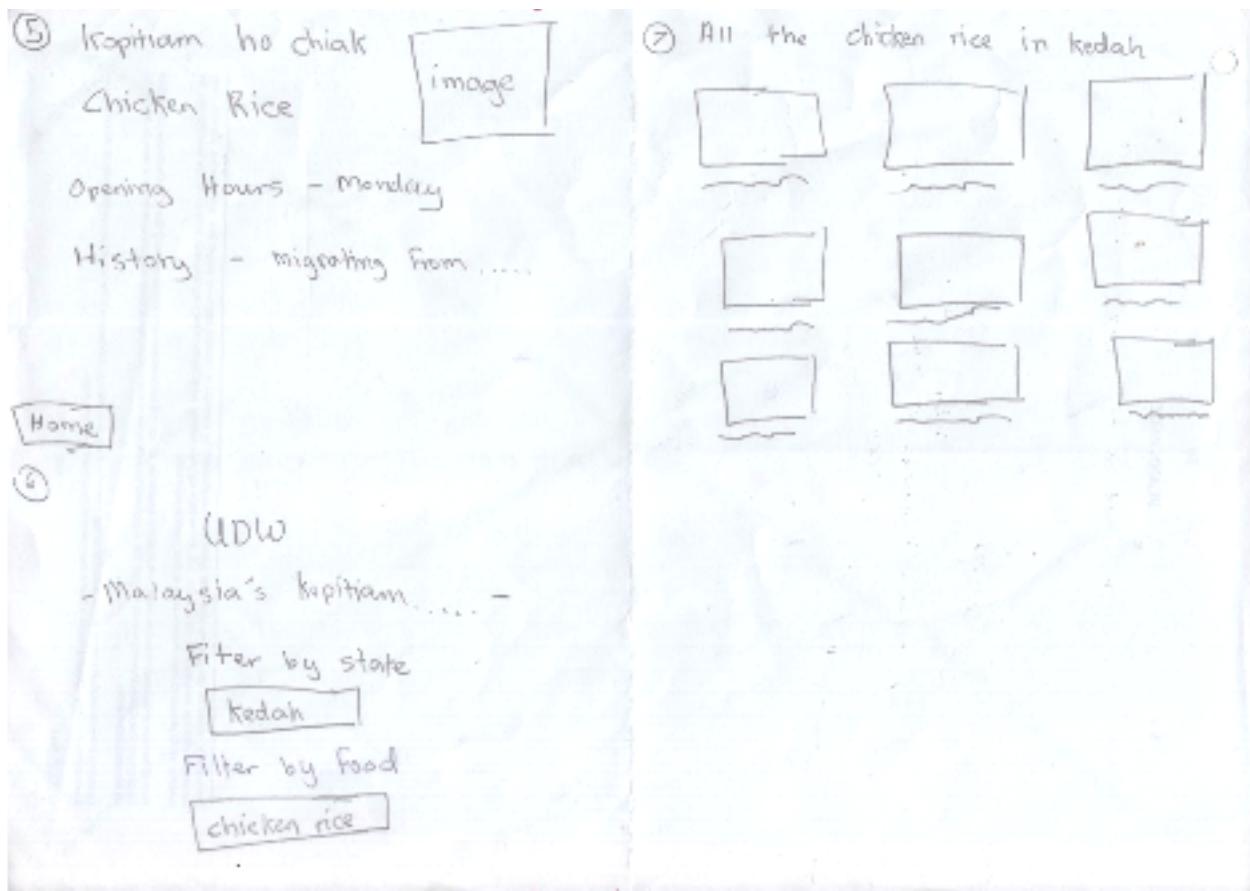
Appendix E : Master Blueprint of Design



Appendix F1 : Paper Prototype Flow



Appendix F2 : Paper Prototype Flow



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