A major project midterm report on

Chaurasi Byanjan

a canteen management system

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Submittd By:
Aasma Sharma (15780)
Denish Gurung (15755)
Sanjaya Shrestha (15761)

Submitted To:
Ramu Pandey

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Department of Software Engineering
NEPAL COLLEGE OF INFORMATION AND TECHNOLOGY
Balkumari, Lalitpur

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ABSTRACT

Many organizations provide Canteen as an additional subsidized facility to their customers as a welfare measure. The usage of the canteen by the customers depends on many factors like centralized food distribution center with swift and simplicity in operations. CMS design provides a user friendly system that facilitates quick and efficient operations to cover larger section of employees within a specified time.CMS is paperless and has almost cashless transactions. This system is also compatible in an environment where multiple caterers operate in a closed environment or at multiple locations. The purpose of the project is to reduce the manual work for managing the Food, Items, Orders. Nowadays,people don't have much time to spend in canteen by just there and waiting for the waiter to take their order. Many customers visit the canteen during their lunch break and recess so they have limited time to eat and return to their working place. So this software helps them to save time and order food whenever they want without calling the waiter again and again with the help of QR code.Customer can scan the QrCode and order the food instantly from the food menu, with total amount of bill calculation.

Keywords: Canteen, System, Database, Management,QR code

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1. INTRODUCTION

This is the era of information technology. Science has taken and is taking great strides in this field, which has result in making human's life more comfortable and easier. Today, computers have become necessity of everyone's life like food ,water and air. More efficient computers are incented and more advanced software are developed in order to make many complex process fast and easy. Each and every sector in this age is being computerized with the development of technology. So, by introducing this smart menu driven system our goal is to provide a computerized framework for managing each transactional issues which in turn will reduce time and errors with the proper management of canteen activities. This system facilitates overall management of schools, colleges,restaurant and organizations premise cafeteria that includes food menu as well as their price and the order of people and keeps this records in database.This system manages information about food,order,canteen. In this system the customers dont need to call the waiter again and again for their order because they can access the menu via the QR code in their phone and can order what they want including the quantity ,customer can also view the ingredients of the food and customize the ingredients of the food .Customer order information will be send to the manager and the manager will notify in the kitchen .the chef will respond the notification of the manager by cancelling or taking the order by the availability of the ingredients and will include time that it will take to serve. Management can edit the price of the item and add or delete the food item. This is how the system will work. Overall this system helps the customers and the management to get what they want in short period of time and without doing a lot of hustle. In addition we are also adding the features of integrated map showing the hotels and restaurant using this system. So that customer can find their nearby restaurant and choose to go. Another features we have is recommendation system which is based on the newest item added and customers feedbacks as rating. Plus we are also having the implicit recommendation as the most ordered foods from the overall stats. Using Chaurasi Byanjan will be fruitful to the users and restaurants both. As restaurants can get the data of their customers and know about the stats of users, frequent users and cutomize their menu as per the stocks and day. Users can take advantages of get offers and discount personally due to their no of visits to the restaurants. The app keeps track of the food ordered by the customers and recommends the food likely to eat by customers. The app is helpful for restaurant as it replace the burden of having many waiters and specially in occasions when the customers are high, the waiters will not be sufficient for taking orders and delivering foods. For a customer also, the app will help them to keep track of their fooding habbits.

1.1 PROBLEM STATEMENT

It is seen that customers need to wait long for the menu and they might dont get what they want due to the waiter mistake . For example: well,waiters may heard something different than the item that customer said then that would be a great mistake. This system avoids these kinds of errors beacause . Thus, either for schools, colleges or any other organizations, our project helps to reduce these types of problems. A canteen with proper management facilities customers with proper services allowing the transactional issues to be performed in much easier and satisfactory way. Well there might also arise conflict during payment phase which will be solved by our system because it allows online payment. It becomes difficult to find the nearest best restaurant and hotels, for a person due to information overloaded and sometimes with no information. We have to go in search for good restaurant.Technology like google map can show the relevant info about the restaurant. But the availability of quality foods, customer feedbacks are still lacking. What kind of foods are available, veg, nonveg, vegan etc, we remain confused. Some restaurants do have a attraction like a food delivery robots. Such features are not highlighted enough, to urge a person to visit restaurants. Many times when we visit restaurants we are dissatisfied with the services but rarely we can give the feedbacks and rating to the restaurants. Collecting those feedbacks and converting to feedforward can really helps a business/restaurant grow and increase the customer satisfaction. But a proper system is lacking which connects a restaurat to the customer, where they can communicate about their problems and inconvience. In Nepali society, we remain confused for what to eat, after long discussion we order the same MO:MO and Chowmin, we forget the market trend, we forget to taste something new. A recommendation system is needed, as mostly we eat foods advised by the friends or on discount offers. So recommendation is lacking as their no other factors which helps us to choose the food to eat. On various occasions, restaurant gives offers and discounts, but cutomers remain unknown about such, only when paying the bill, they will know about the offers, If customers knows about the offers and discounts previously, they can make a plan to visit the restaurants. A good application addressing afforementioned problems is much required in market. As their are many such applications but none seems to provide a good solution to these things.

1.2   PROJECT OVERVIEW

This project focuses on creating a smart city, where restaurant and hotels goes paperless and digitized. This way people can be benefitted once they are aware of this. Digitizing the tradionally approcah of ordering foods in hotels is one of the fundamentals of this project makes it possible. Customers or peoples need hotels and restaurant for proper rest and proper lunch and restaurants need a good no of customers for sustaining their business. The project helps to connect them and make a good information flow among them. As this project also integrates the google map which shows the nearest hotels to the person location so as per their choice they can decide where to go. As the market needs this kinds of application It have high expectation of increasing in numbers.

1.3   PROJECT OBJECTIVES

The main objective of cms is listed below

- To develop a common platform for connecting hotels/restaurants and customers, customers can place their order in samrt way and restaurants can manage the orders and customize their food menu.

- To develop a system which keeps records of all the orders given by the cutomers to the manager.

- To develop a admin panel for customizing the hotel menu, adding offers, discounts.

- Boosting the restaurants offers and connect restaurant customers

- To help people choosing their favourite foods as per their iterest via recommendations.

- To integrate map which shows the nearest hotels

- provide authenticated login system to enter to the personalized dashboard

1.4   SIGNIFICANCE OF THE STUDY

QRCode system, there are many practices or effort focusing on digitizing the menu of restraunts, hotels by using different hardware systems but investing on hardware to develop system seems to be costly and chances of technical failure is also high so service providers are likely to be demotivated in using hardwares so the approach of QrCode system is likely to reduce the cost for investing in hardwares. Digitizing the menu system is one of the needed issues. As many service providers are using printed meny system which are torn out and updated. Digitizing such menu can be cost effective and updated regularly as per the season and time. The traditional way of serving food creates a problem of misunderstanding and conflicts. Digitizing menu will also helps on choosing the food, We generally lose our time in discus- sion of what to eat, embedding a personalized recommendation system will helpful on choosing food. Tracking the food history of person can help to predict the likely food or related food. Integrating online payment system, payment method had also remained tradional rarely the change is happening, digitizing payment system is also much needed, It helps in saving time and easy to handle any no of customers. Chatbot, there are simple questions, sometimes we needed like location of washroom, halls, buildings, rooms. Embedding a chatting system is also necessary to reply these simple questions.

1.5   SCOPE AND LIMITATIONS

The main scope is to modernize the canteen with the help of new technologies . The application is especially targeted to the restaurant,school canteen ,bank canteen who don't want to spend more time for ordering.

- Be updated or notified with the offers and discounts provided by the hotels and restaurants.

- Perfect platform for a hotel and restaurant business to promote their business by attracting peoples.

- Connect hotel and restaurants with the customers in one place where they can share their feedbacks and reviews.

- Having the customers data, hotel and restaurant can expect the no of customers and the high demand foods as per the season and occasion.

Project seems to have a good addressing of ongoing problems about the connection between the customers and restaurants, It do have some limitation which might be quite critical at times. Some limitations of this project are:

- Customer can order only by accessing the QR code.

- Customers can't change the whole ingredients of the food.

- The recommendation system works in 3 factors only which will be not efficient for proper recommendations as the changing customer preferences, seasonal foods and unsimalirity of the food qualities.

2. LITERATURE REVIEW

This section consists the literature study on the similar existing project in the market, Our project is looking forward to define all the possible services, so that there is an intelligent system for customer to use.

2.1 REVIEW

As market competition intensifies, many restaurants began to use information technology to change the service models and business models. On this basis, the wireless ordering system came with the tide of fashion. We see many projects done using Arduino, micro-controller etc. But our concept of this project helps the both parties on saving their time and money. Saving restaurant operating cost, service efficiency, deepen customers.

2.2 QRCODE

Qr Code [Quick Response Code] is a kind of barcode which consists a matrix of dots, which can be scanned with the QR scanner or smartphone camera.After scanned, the software on the device converts the dots into numbers of string of character. All the Qr code have a aquare shape and include three square outlines in the top-left, top-right, and bottom-left. These squares defines the orientation of the code.Qr Codes are two dimensional, they do contain significantly more data than the one dimensional UPC. A 33X33 (version 4) Qr Code contains 640 bits or 114 alphanumeric characters. A 177X177 (version 40) QR Code can store up to 23,638 bits or 4,296 characters.

2.3 GOOGLE MAP API

Google allows google maps api to integrate into the websites and mobile applications. By using api it is possible to embed google map to our projects. It is even easier to use google map as it is integrated to the angular as angular google maps.

2.4 EXISTING SOLUTION

Wireless Menu Ordering[1]: As the name suggest it is also the similar application serving the same purpose, to make the hotel work go paperless and increase service

efficiency. It implements touchscreen based wireless menu ordering for restaurants implemented in most of the advanced restaurants. There have been encountered many minor problems that need to be eradicated with much efficiency. **PROS**

- It replaces the tradional approach of food ordering system

- It keeps records of daily transaction

CONS

Some of the minor problems are enlisted below:

- High use of power supply, Due to touch screen and Graphical LCD to select and display the selected food and needs continuous supply

- Expensive on investing hardwares, as it needed a single setup per table.

Taken into consideration above mentioned problems, we bring out the new concept to enhance the digitization of menu system. QRCode based menu digitization system with features of online payment. Since this is a web based service the ability of handling multiple customers and queueing the orders saves time maintain FCFS methods. Having thus system is a smart choice for everyone.

Canteen Management System[2]: This is a mobile aplication limited to single canteen/hotels. When users are within the range they can access their menu and make orders.The app is limited for one canteen only. So users cannot use it often. DUe to high use of technology, the restaurants are motivated to develop their own applications and websites for online orderings.

PROS

- Users can place orders remotely, and use home delivery services.

- Remote table reservation can be made, specific to one hotel is helpful.

CONS

- User is limited to one hotel only, but user preferences will be from multiple hotels.

- Multiple hotels need multiple application to serve.

Online ordering system: Many websites and mobile applications like, Bhojdeals, Foodmario, Bhoklagyo, Foodmandu, 911 express are in operations where a user can place their order from favourite restaurant. The data obtained by these applications are not provided to restaurants they are third party agents.

Toas POS One of the most popular solutions in the restaurant management software category is Toast POS. In this article, we'll tackle the pros and cons of Toast POS to help you understand if the product matches the needs of your restaurant processes. Toast POS is an all-around restaurant management and a point-of-sale system that streamline your restaurants operations. **PROS**

- All-in-one restaurant management solution

- Efficiency in running restaurant processes due to embeded multiple features

- It is available for a franchise restaurant or restaurant group to increase profitability

CONS

- Due to high volume environments system may face a potential lags

- Due to highly rich features, mastering all cotrols and features takes time

- Due to potentially losing internet connection, during transaction may create problem

- UI doesn't looks as modern so customers may not impressed because of it.

CAKE CAKE from sysco is an integrated POS, online ordering and guest management tools, especially created to aids restaurants, cafes and bars. It can manage waitlisting so that customers won't have to wlak away.

PROS

- Integration of Guest Manager and Online ordering system helps both customer and staff for automating their task.

- It shows the data of the visitors waitlist, viewing guest history, and optimizing the reservation process.

- Customers can make the online reservation through the mobile application

CONS

- Expensive to implements, due to rich in sevrvices it is quite expensive than others

- It monetize all the activities of the restaurants online which is likely to be affected offiline.

- Challenging to implement the system as it is new in market and consists of lots features which hampers the business days.

- It handles all the restaurants tasks generating large amount of data, so the cost of hosting the data will be higher.

2.5 SOLUTIONS OFFERED TO THE EXISTING DEFICIENCIES

Chaurasi Byanjan is looking forward to digitize the food ordering system in hotels and restaurants. Using the integrated google map which highlights the nearest hotels and restaurant to the user location. The application will be light enough for a user to download and can be used for any hotels collaborating with our project. So only one fooding app helps a user to track its all activities. The embeded smart recommendations system helps user to choose their food. The app will keep the records of user preferences and notifies the user about the dine-in deals, discounts, offers from different hotels and restaurants.

The app will gather the latest information about the hotels and notifies to customers. The accesibility of the admin panel helps a restaurant manager to manage the food menu, adding special offers, Daily menu, discounts etc. It will help to customize the menu and keep the item suspended if not in list.

QR Code concept highly decreases the budget of implementation, It is highly flexible to use. Generating QR Code is also easier, as we had embeded it in admin UI so installation can be made by restaurant self, Scaling is also easier as maager can add and delete the tables with no extra investments.

3. METHODOLOGY

This section describes the methodology that have been followed during the development of the project. We used the following methodologies for the application, knwoledge and skills, tools and techniques to a broad rage of activities in order to meet the requirements of our projects. The following contents describes the detailed information about the software development process, project approach and tools we used for our project.

3.1 SOFTWARE DEVELOPMENT WORKFLOW

The project has been developed as per the agile methodology of software development as depicted in Figure 1. The reason for choosing this model is the lack of sufficient time duration for agile and iterative methods, as well as very low chances of the changes of requirements in the process of development.
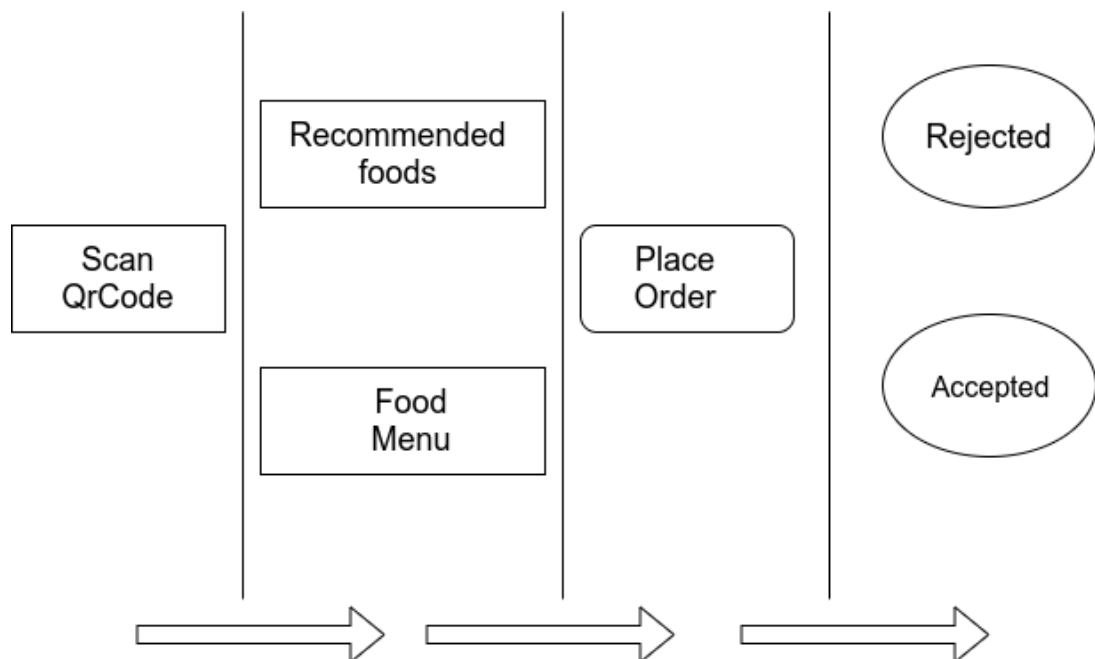
Figure 1: project workflow

Customer should connect to the wifi in order to enter into the system, The web service is hosted locally within in the restraunt local server or limited to restraunt wireless connection. When the customer is connected to wifi then, he/she can scan the QRCode placed in table/spot specified and unique to eachother, When they scan the qrcode, it is like check in to the spot and spot is reserved unless they checkout manually or by manager. After scanning, user is redirected to the menu system provided as web platform. Customer can now order their food which will be submitted to manager.

3.2   SOFTWARE DEVELOPMENT LIFE CYCLE

Among the various software development life cycle we are using the Agile Method-ology as it is flexible and easy to implement. It mainly focus on the deliverables of product. It seems to be very effective to implement for our software development

3.3   AGILE METHODOLOGY

Agile methodology is highly effective method of software development. Since it fo-cuses more on individuals and interactions instead of processes and tools. Working software is more impor- tant than comphrensive documentation. Process should re-sponds change rather than following plan. Agile methodology helps to deliver cus-tomer satisfaction by delivering valuable software continuously. It always accepts change of requirements how early or late in the project. It helps to deliver software within a shorter timescale. Sprint system in agile is proved to be highly effective as it regularize the developemnt speed and helps to accomplish projects in time.
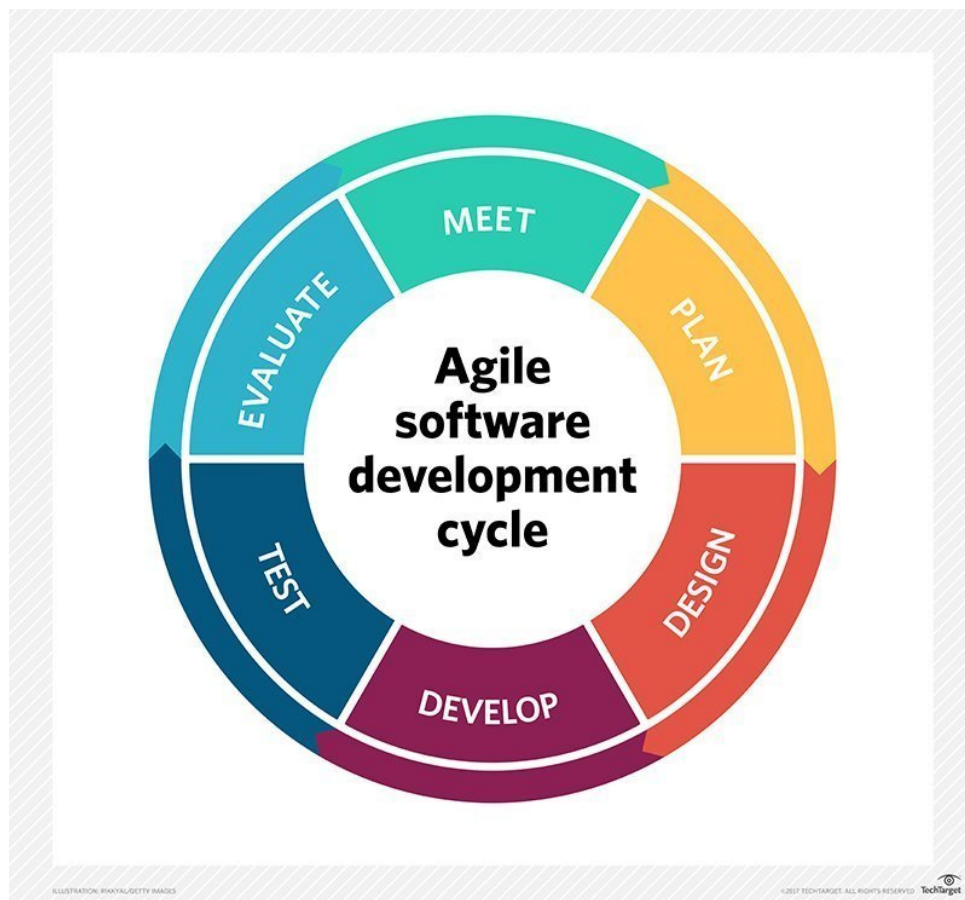
Figure 2: Agile methodology

3.3.1   SCRUM

Scrum is a management framework with abilities to control and manage the iterations and increments. It is lightweight and can be used for various engineering practices. Sprint have consistent duration throughout the development effort.

During the sprint: No changes are that would effect the Sprint Goal. Quality goals do not decrease Scope may be clarified and re-negotiated between the Product Owner and Development Team as more is learned. Each sprint has a goal of what to be built, design and flexible plan that will guide developing it, and results the product increment. There are 4 formal events that scrum prescribes.

- **Sprint Planning:** Sprint planning illustrates about to plan to complete the part of system. Sprint planning involves to elaborate the task to complete within that sprint. It is like to write the backlog of project particularly for a sprint.
  Sprint Planning answers the following questions:

  - What can be delivered in the increment resulting from the upcoming Sprint?

  - How will the work needed to deliver the increment can be achieved?

  The works are selected from the product backlog and brought to sprint backlog. The work on the sprint backlog is a forcast not the commitment. The container is sprint is a time box, not the worked planned for the sprint. The sprint goal is the objective aspected to meet by the end of the sprint through the implemetation of the backlog. It also provides the guidance to the development team.

- **Daily Scrum:** It is a daily meeting between project partners or co-workers, to explain about the status of the assigned task to the co-worker and scrum master, who keeps track of the ongoing project and sprint. The daily scrum is a event for the development team to synchronize activities and create a plan for next 24 hrs, It is held everyday of the sprint, this optimizes the team collaboration and performance by inspecting the work since last daily scrum and forecasting the upcoming sprint work. The Development Team uses Daily Scrum to inspect progress of the Sprint Goal and to inspect how progress is going towards completing the work in the Sprint Backlog Basically it answers 3 question

  1. What was done yesterday, to meet the sprint goal?

  2. What was done today, to meet the sprint goal

  3. What are the roadblock preventing to meet sprint goal

- **Sprint Review:** It is carried out once the Sprint has been done.It is meant to inspect the increment and adapt the product backlog if it is necessary. It is

held at the end, for inspecting the increment and adapt the Product Backlog if needed. The scrum team and stakeholders collaborate about what was done in the sprint.

The sprint review includes the following elements:

- Attended includes Scrum Team and key stakeholders

- Product Owner explains what Product Backlog items have been Done and not been Done.

- The Development Team discusses what went well during sprint, what problems ran into it, how the problems were solved.

- The Development team demonstrates the work that it has Done.

- Product Owner discusses the Product Backlog as it stands.

- The entire group collaborates on what to be done next and provides valuable input to subsequent Sprint Planning.

- **Sprint Retrospective:** This is a chance for scrum team to carry out an inspection of what has been done and develop a plan for improvements with the next sprint. It is done before the sprint planning begins and after sprint retrospective. It occurs after the Sprint Review and before the next Sprint Planning.

  - What went well in the Sprint?

  - What could be improved?

  - What will we commit to improve in the next Sprint?

    By the end, The scrum team should have identified improvements that should be implemented in the next Sprint.This will be a adaptation to the inspection of the scrum team itself.
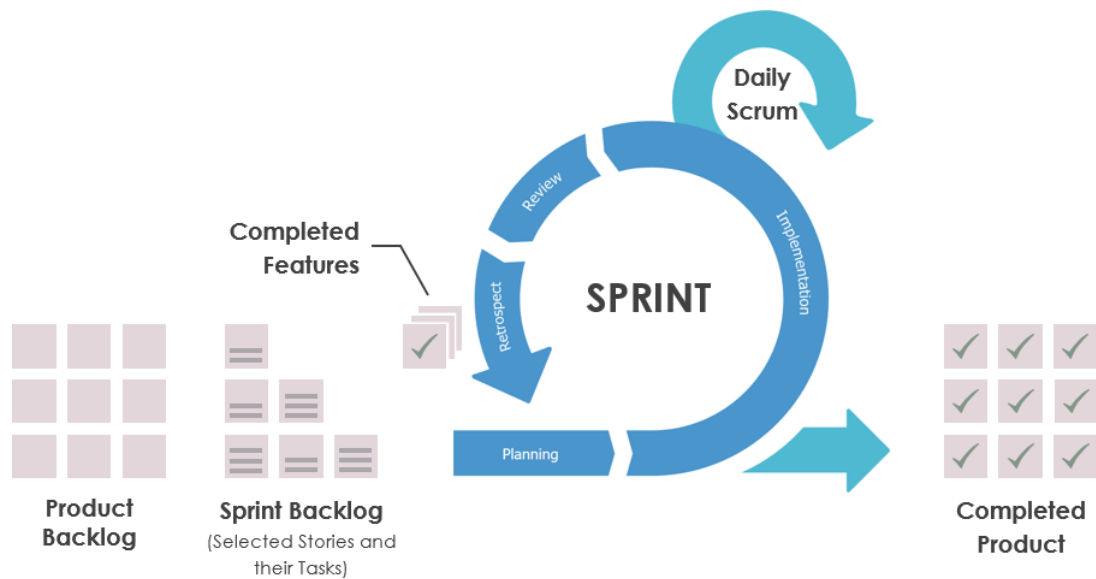
Figure 3: Scrum Sprint

3.4   Scrum Team

Scrum team consists of Product Owner, Development Team and Scrum Master. Scrum teams are self oraganising and functional rather than being directed by external.

Product Owner:

Product Owner acts as a sokesman for the customer and defines features of the product based on the backlog item. He should prioritize these features according to the time and profitablity.

Scrum Master

He is resposible for making sure a Scrum teams lives by values and practices of Scrum, and for removing any impediments to the progress of the team.

Scrum Team

It is the group of people developing the product. There is no personal responsibility in Scrum. The whole team fails or succeeds as a single entity.

3.5   How We DID it?

3.5.1   Scrum Roles

Poduct Owner Ramu Pandey, Supervisor of this project was the product owner of this project, and acted as spokesman for Chaurasi Byanjan.

Scrum Master

All team member wanted to try being a scrum master, So the role went to all members at least for one sprint.

Scrum Team:

There were no specific roles we took on in our team, bit members tended to stick to the modules they developed and tried to became experts in their areas. We ensured that every task was reviewed by other team members.

4.   MILESTONES

4.1   SPRINT 1

The first sprint we had no contact with the product owner and due to this we we decided to do some research in areas we knew would come in handy,and some basic design and illustrating concepts.This sprint lasts for 2 weeks. We brainstorms on our idea and tried to sketch some scopes and projects backlogs.

Task Completed in this sprint:

- Brain storming on projects and configuring the possible project features.

- Basic design prototypes was created, for conceptualizing the idea.

- Researched for other similar products and tried to figure their pros and cons

Table 1: Retro meeting of sprint 1

What went well	What did't went well?	What to do next?
Project development initiated	Product Owner was not assigned	Prepared time schedule for development
Brainstormed about project idea	Daily Scrum meeting was not possible	Time scheduled for meeting
Researched about the project		Assginment of Supervisor

Table 2: Scrum Board of Sprint 2

TO DO	DOING	DONE
Design Project Architecture	Project Research	
Technologies finalization	Feasibility Study	Project Name decided
Task division	Study of Project Complexity	Project repo created on gitlab
Requirements Analysis		Scrum board created in Trello
UML diagram designing		
Discussion for Development strategy		

Retrospective meeting:

4.2   SPRINT 2

This was the first real sprint and the first time we had meeting with our product owner. The duration of this sprint was about 3 weeks due to the vaccation of Dashain. We had many discussions about the projects, proposed features and project estimation. The project backlogs was created, with proposed necessary features.

Table 3: Retro meeting of sprint 2

What went well	What did't went well?	What to do next?
Project development continued	Problems on deciding technology	Needs to learn mobile app development
Guidance from supervisor was helpful	Daily Scrum meeting was not possible	Time scheduled for meeting updated
Development workflow started		

4.3   SPRINT 3

The third sprit also lasted for 3 weeks and devoted to extend our project prototypes. The actual coding was carried out on this sprint, The backend was started with rest api for connecting admin panel and user UI.

Table 4: Scrum Board of Sprint 3

TO DO	DOING	DONE
Design Project Backend Architecture	Log In page design UI	
User backend and Admin panel backend	Rest Api integration	
User login and admin panel login	Backend development of login	
User sign up	Backend development of sign up	
Qr code scanner		
Qr code generator		
Data Collection of restaurant		
Restaurant Menu data collection		
Admin panel dashboard design		

Table 5: Retro meeting of sprint 3

What went well	What did't went well?	What to do next?
Backend development ongoing	Problems on connecting to backend	Ui development should be completed
Project development speed was quite good		API testing should be done
Guidance for api development		

Table 6: Scrum Board of Sprint 4

TO DO	DOING	DONE
Angular map integration	En	
Qrcode backend	Rest Api integration	
Food Menu customization with CRUD	Backend development of login	
Saving the QrCode generated	Backend development of sign up	
Testing of LogIn and SignUp Recommendation system		

Table 7: Retro meeting of sprint 4

What went well	What did't went well?	What to do next?
Halfway through the project	Problems on Angular components	Ui development should be completed
Project developed as expected		API testing should be done
Guidance development		

4.4 SPRINT 4

The time frame of this sprint was two weeks due to shortage of the time. In the beginnig of this sprint we decided to do more work than usual since all other sprint completed with little to do. We ended the sprint with the cluster which couldnot run the program properly, the program consists of bugs which was later fixed. Somehow we got to develop a working app with minimum features, a MVP.

Table 8: Technologies used

Subject	Technology
Backend Database	MySql
REST API Service	Django REST Framework
Android Client	Native Script
UI	Angular 7
Api Documentation	Swagger
Google map	Angular google map
Documentation	LaTeX
HTML, Bootstrap	UI designing

Table 9: Tools used

Tools	Purpose
VsCode	Frontend development
Pycharm	Backend development
API testing	Postman
Code hosting	Gitlab
Project Management	Trello

4.5 TOOLS AND TECHNOLOGY USED

Table 9 consists of the major technologies that are proposed to be used during development and deployment of the application. They are briefly described in the subsections that follow.

4.5.1 MySQL

MySQL is one of the most widely used relational database management system (RDBMS). The major reason for us to choose this database is that it is completely open source. Some of the established tech corporates like Facebook, Twitter, Youtube etc. use

MySQL. It also has very good user base and the usage is easier thanks to comprehensive documentation and support.

4.5.2 Django REST Framework

Django REST framework is an open source framework for building Web APIs. The framework provides features like authentication, tokenization, session handling, serialization, etc. for users to build API in short amount of time. The language used is Python.

4.5.3 Angular

Angular is a platform for building mobile and desktop web applications. Angular is an open source framework for building mobile applications using Javascript language. In addition to the usage of widely used language like Javascript, Due to use of the typescript it is more easier to learn and build.

4.5.4 Native Script

Native script is a platform to built a truly native mobile app using a web framework like Angular, Vue. It also has cross platform support so that both Android and iOS applications can be built using same code base.

4.5.5 LaTeX

LaTeX is widely used documentation preparation system for preparation of scientific documents, books and technical papers. It uses plain text for formatting unlike other document creation systems. The source code is compiled by a compeller to generate the printable/viewable document.

5. REQUIREMENT ANALYSIS

Requirement analysis: encompasses those tasks that determine the needs tof the project or a product, taking account of conflicting and complex requirements. It is the early stage activity of a product development which consists of all activities concerned with development, analyzing, documenting, validating and managing system. The requirement analysis of the product to be developed was done before everything else during the project. During this phase, our team worked together to find out what features were expected of the product to be developed. It was also helpful to filter what is important and what is not important features to be added in the application. The requirements were widely classified into two categories: functional and non functional requirements. Functional requirements are those requirements which define a system or a component by the functions it should perform. Non functional requirements are those which describe quality attributes in a system.

The most widely used tool during the requirement analysis phase in our project was the user story and diagrams. The project team members first described the actions a user would perform on the system during a particular scenario, and then it was converted to diagrammatic form

5.1 SYSTEM REQUIREMENT SPECIFICATION

5.1.1 Functional Requirements

Implementing agile methodology for software development, initially we went through writing user story, illustrating important functional requirements.

Customer

- Customer can create account using their gmail, facebook link.

- Customer can scan QR-CODE

- Customer can view menu

- Customer can view food, ingredients, price, cooking-time, image

- Customer can place order with food qty, customize ordering, packaging, serving

- Customer can view their order history

- Customer can view discount, offers, provided by restraunt

- Customer can cancel the order

- Customer can pay online bills

- Customer can divide bills per friend

- Customer can give feedbacks, rating

- Customer can view recommended foods

Manager

- Manager can add food menu, price

- Manager can offer discounts

- Manager can view order details

- Manager can reject order place in queue

- Manager can view table status

- Manager can view user check in, check out

- Manager can view food qty, ingredients qty

- Manager can view order history, summarize daily selling

- Manager can give discounts to person

- Manager can add food qty for kitchen

- Manager can place ordering item for kitchen]

5.1.2 Non Functioal Requirements

Non functional requirement also plays an important role in sucess of application. As the end users are public peoples we need a strong UI for impression and otherlooks, accesibility.

- The application should be user friendly

- Proper working tools for efficient development and testing

- Application needs to operate peoperly with proper response

- Application should have high performance with good responsiveness, scalability, uability, reliability, security, modifiability and maintainability.

5.2   Input Requirements

Data Required
The data to be input are:

- User Information: This contains the user info, full name, username, password and email.

- Restaurant: This consists relevant info of restaurant like location, name, time, username, password.

Source of data

- The information will be given by user themselves with their preferences for recommendation.

- The data of restaurant will be initially supplied by our team, which later can be updated by the restaurant.

5.3   Input List and Validation

The user input for each,are categorized on the basis of entry by the user. They are tabulated below and along with data description, validation and length which is helpful for designing.

5.4   OUTPUT REQUIREMENTS

Output Objectives:
The user requires the following output from the system:

1. Nearest Restaurant around the user location

2. Recommended foods for user

3. Offers and Discounts from various restaurants

Table 10: User Details

S.N	INPUT	DATA TYPE	LENGTH	DESCRIPTION
1	Fullname	Character	255 characters	for full name of users
2	Username	Character	255 character	It is the username of the user
3	Email	Email	255 character	For mailing user
4	Password	Character	20 character	Password of the user for system log in

5.5   SECURITY REQUIREMENTS

Users and Restaurant managers are required to sign up and then only get the access to their dashboard. Each user can have their personal data/record. They can modify their data and preferneces. Therefore each user have their own username and password to login to the system.Password are saved in database which are hashed by django rest authentication mechanism, which will keep the system secured.

Table 11: Restaurant Details

S.N	INPUT	DATA TYPE	LENGTH	PURPOSE
1	Username	Character	255 character	Username for system log in
2	Password	Character	255 character	Password for system log in
3	Name	Character	255 character	Public name of restaurant
4	Address	Character	255 character	Address of the restaurant
5	Latitude	Float	Standard	Latitude co-ordinate of the restaurant
6	Longitude	Float	Standard	Longitude co-ordinate of the restaurant location
7	Information	Character	255 character	Short description of the restaurant

6. SYSTEM DESIGN AND UML MODELS

The designing is based according to the system requirements. We tried our best for illustrating all the user requirements of the system.

6.1 ARCHITECTURE SKELETON

The system architecture of 'Chaurasi Byanjan' is a three tier architecture system which includes a presentation tier, an application tier and Data tier. The followig diagram roughly sketch the architecture of the system.
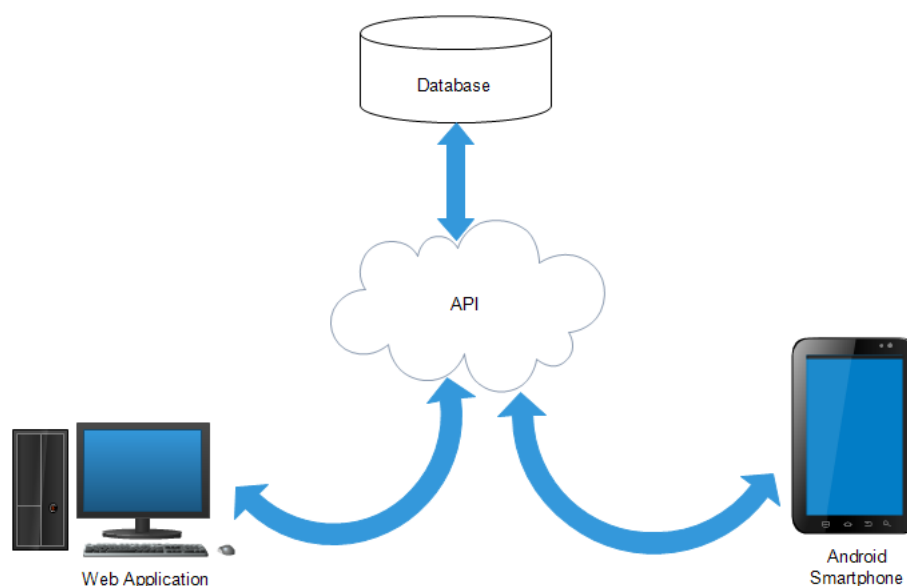

Figure 4: System Architecture

Presentation Tier: It is a UI through which users can interact with our system. Sign in/ Sign up pages restrict unauthorized users to use the application and UI, for display of the recommended foods and Google Map for the location of the nearest restaurants and hotels.

Application Tier: It consists of our logical operations and data access of the project application User can update their data, place the order and search the food in menu, which are proceesed in this tier. Use of APIs such as Google Map, Facebook and other material Design libraries are included in Application Tier of the project. **Data Tier:** It is our Database where information are stored and retrieved upon user and system request.It also includes other third party databases which are accessed with the call of provided API function calls.

6.2   USE CASE DIAGRAM

A usecase diagram represents the overall system activity in a single diagram with the user and their possible actions.
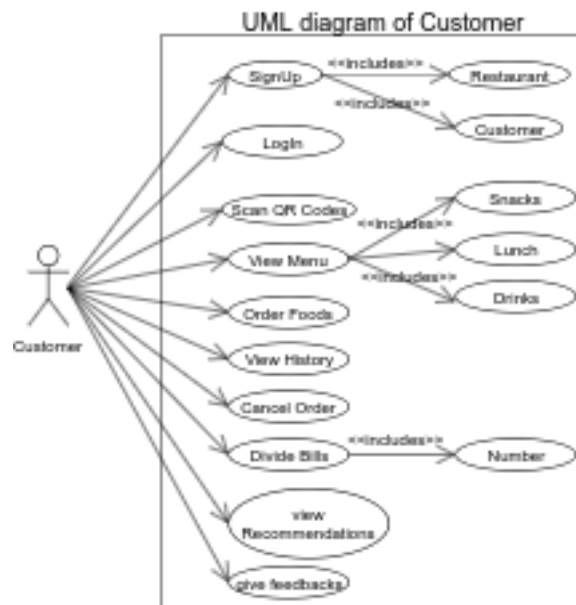

Figure 5: usecase diagram of customer

6.2.1   Use Cases

Table 12: Sign In use case

Name	Sign IN
Actor	Customer, Managers
Precondition	Users are not Signed IN
Description	- Application users type his/her username and password. - Application users click Signin Button - Application users are signed in If application users enter invalid username and password, then they are restricted to use the application and asked to enter the valid credentials
Postcondition	Users are now signed in and can use the app.

6.3   Schema Diagram

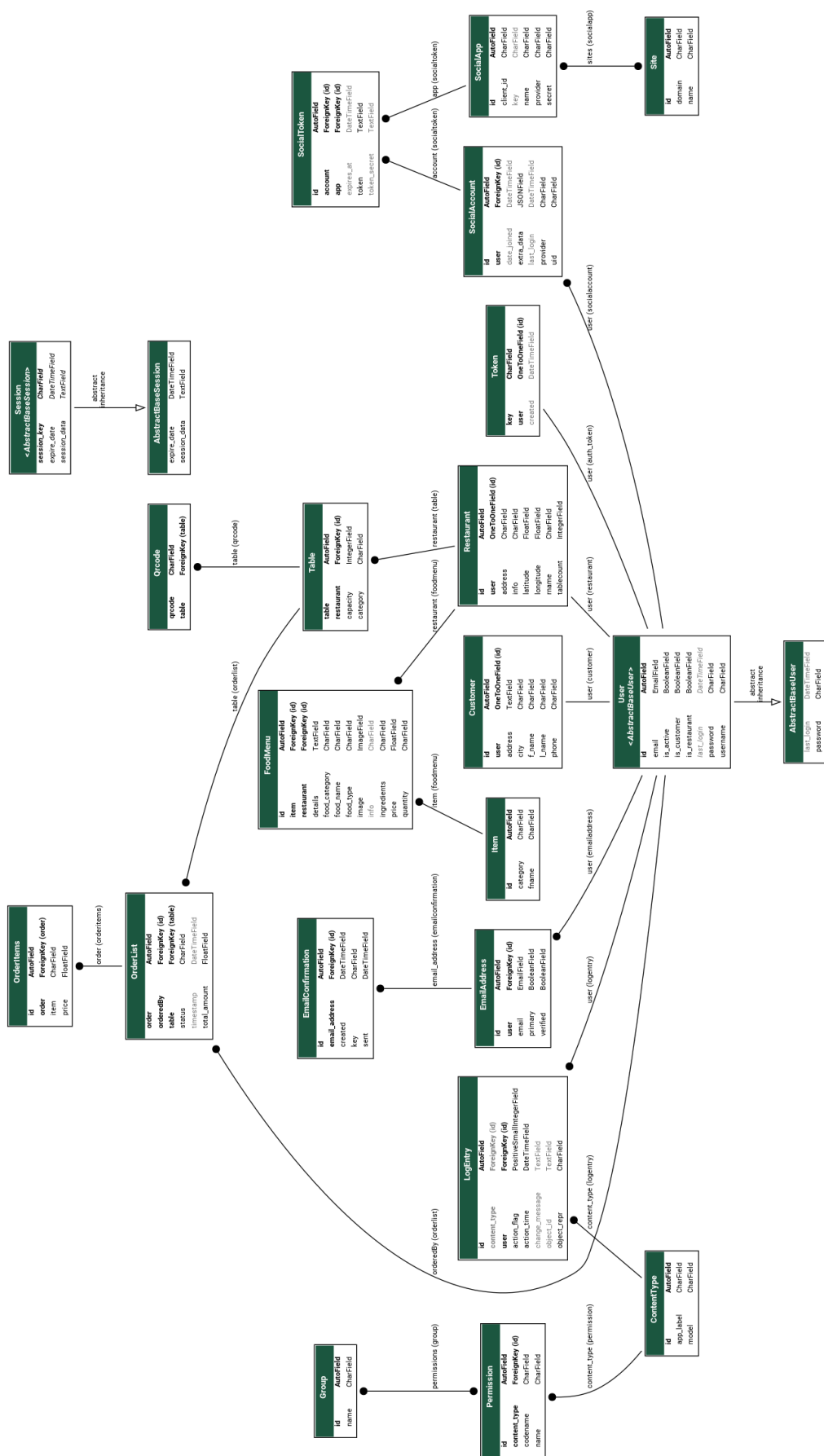The following class diagram illustrates the database schema used for the application.

Figure 6: Schema used in backend database

The database used for the API backend in the project is MySQL. Since the mobile applications do not access the data directly from the database, the API server is responsible for fetching the data in accordance to the API query and send it to the mobile device.

6.4 Data Collection

Our team has collected data about the various restaurants and hotels (the data include the location, the photos, latitude, longitude, how to get to that place etc.

The following figure shows a sample of data collected by our team.

	name	address	latitude	longitude	image_url
1	name	address	latitude	longitude	image_url
2	Nepal Tara Halal Food Restaurant	Narsingh Chowk Marg, Kathmandu 44	27.7208724	85.3027656	https://www.google.com/maps/uv?h
3	Kathmandu Steak House Restaurant	Chaksibari Marg, Kathmandu 44600	27.7208106	85.3011962	https://www.google.com/maps/uv?h
4	The Ship Restaurant Bar & Lounge	Amrit Marg, Kathmandu 44600	27.7225901	85.3062459	https://www.google.com/maps/uv?h
5	REEF Restaurant and Lounge Bar	5F, A1 Business complex, Thamel Ma	27.7220831	85.3062459	https://www.google.com/maps/uv?h
6	Roadhouse Cafe	Chaksibari, Thamel, Kathmandu 4460	27.7211791	85.3011962	https://www.google.com/maps/uv?h
7	Thamel House Restaurant	Thamel Marg 1, Kathmandu 44600	27.722553	85.3062459	https://www.google.com/maps/uv?h
8	Places Restaurant & Bar	Saat Ghumti Marg, Kathmandu 44600	27.7219642	85.3055736	
9	Friends Restaurant	Mandala St, Kathmandu 44600	27.7217803	85.3055736	
10	Villa Everest Korean Restaurant	Amrit Marg, Kathmandu 44600	27.7224845	85.3062459	
11	Hankook Sarang korean Restaurant	J P, Road, Kathmandu 44100	27.7212194	85.3055736	https://www.google.com/maps/uv?h
12	Yin Yang Restaurant	J.P. Road, Kathmandu 44600	27.7213325	85.3055736	https://www.google.com/maps/uv?h
13	La Dolce Vita Italian Restaurant & Bar	Chaksibari Marg, Kathmandu 44600	27.7216248	85.3055736	https://www.google.com/maps/uv?h
14	Mezze by Roadhouse	Mercantile Plaza, Durbar Marg, Kathm	27.7190106	85.3036966	
15	Sapporo Japanese Restaurant Kathmar	Anamika Marg Baluwatar opposite Ru	27.7274846	85.3014426	
16	Loving Heart Vegan Restaurant	Z Street, Kathmandu 44600	27.7222297	85.3034939	
17	Nepali Chulo Authentic Restaurant and l	Lazimpat , Behind Hotel Gangjong, Ka	27.7234558	85.3061528	
18	Trisara	Lazimpat Rd, Kathmandu 44600	27.7225356	85.3043271	
19	OR2K	Mandala Street, Kathmandu 44600	27.7214379	85.3055736	
20	Melrose Restaurant & Bar	Amrit Marg 350, Kathmandu 44600	27.7208053	85.3027656	
21	Classic Mo:Mo	265 R R Building, Narayan Chaur, Na:	27.7217368	85.3073835	

Figure 7: Model of data collection

6.5 BACKEND API

The API endpoints for creating, updating, reading and deleting the data from all of the tables shown in Figure 8 have already been created. The following table shows the syntax of different endpoints of the API.

The following figure shows an instance of API request and response.

menu

Figure 8: api documentation

7. RESULTS AND DISCUSSION

Due to time limitation we could only achieve a working frontend part of admin panel and mobile application. The backend part of manipulating data is completed. The business part of recommendation engine and we are collecting reference data to train the model.

8. DELIVERABLES

The following will be the major deliverables that produced at the end of this project.

8.1 RESTFUL API SERVICE

There will be a running instance of RESTful API service developed and deployed at the end of the project. This API will be responsible for communicating between the client applications and the central database server.

8.2 ANDROID CLIENT APPLICATION

The application will be developed integrating all the features proposed earlier. The users will be able to use the application to scan QR codes at different table which will return them the menu of respective retaurants. An interactive map will be integrated with the application that shows the location of nearest restaurants and hotels, using this service. The application will also be integrated with social networking platforms like Facebook, Twitter, Instagram etc. so the people can share with friends about the application.

9.   PROJECT TASK AND TIME SCHEDULE

The working time period for the project is three months with two months gap in be-
tween. The project will be completed by the end of the spring semester as per the
requirements of the university. The major task division among the team members is
mentioned in Table 13.

Table 13: Division of tasks among project team members

Team Member	Assigned Tasks
Sanjaya Shrestha	Mobile app development API Development
Aasma Sharma	Admin panel UI Data Collection
Denish Gurung	Project Documentation Graphics Design

The time schedule of the project is illustrated in Figure 9.

Figure 9: gantt chart

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