Virtual Cook

SMART E-DELIVERY ROBOT SHARING SYSTEM

A work submitted in partial fulfillment of the requirements for the degree of
Bachelor of Science in Computer Science

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Certificate of Approval

It is certified that the work presented in this Project titled

VIRTUAL COOK
SMART E-DELIVERY ROBOT SHARING SYSTEM

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Under my supervision and that in my opinion, is fully adequate, in scope and quality, for the degree of BS in Computer Science.

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Sehrish Talat

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Definition of Terms, Acronyms and Abbreviations

Term	Description
Android App	Application Development
IOT	Internet of Things

Table of Contents

1. Introduction

1.1 Purpose of Document

The aim of introducing **Virtual Cook** is to get rid of more wastage of time that are consumed in cooking purposes as well as it overcomes the problem of slow delivery of food.

Mostly People face problems while cooking meal at home, when you have fewer ingredients available and want to cook, deliver, purchase and sell something great it's the app for you.

The **Virtual Cook** is a ride solution to solve the problems occurs in cooking and delivering purposes. Just like other cooking apps, it will advise the recipe of cooking food, but,

not tell you the ingredients. In facts, this virtual cook app will first ask the users about the available ingredients and will come up with a dish that can be made with those ingredients on its own, by which you people can sell, purchase and deliver that dish as well, so that the user won't have to rush for the other additives.

Beside this, **Virtual Cook** would be a great financial benefits for the industrial people, as well as house living ladies that she can cook and sell something great online by living at their homes for those people who doesn't have much time to prepare meal and also wish to eat home-made-meal**.** So for those candidate ease the **Virtual Cook** provide **Robot** that would provide the deliver functionality at their doorsteps.

People will simply have to install an application on their cell phones to get recipe information either to sell that cooked meal or to buy it by access the available delivery **Robot** at the nearest office. Robot would be placed at a specific office from where the seller may access their availability through application. Any seller who want to deliver something to the buyer just have to call the robot from the nearest office through application. Once the robot is allocated to that seller for a fixed period he has to return it within this time frame. He will use this service within Sargodha area only.

1.2 Project Scope

Virtual Cook is bascially a robot sharing system. The objective of presenting this Robot is to ease for the people who want to cook and deliver something great so App will first ask the users about the available ingredients and will come up with a dish that can be made with those ingredients.Smart e-delivering robot surely will be the best choice of busy person

as it enables them to eat homemade meal of their own choice like others and thus Robot will deliver them meal at their doorstep.

Technology in this is simple, efficient and cost effective Arduino, android application & other electronic components are used to precise the control system. Smart e-delivering robot can be control by using smartphone controlling device is also used as alternative of smartphone. In Smart e-delivering robot GPS systems are embedded to track its location. Along with it DC motor is used for making it moveable. Micro controllers are also used to control speed of motor. Bluetooth module is used which communicates with smartphone to move the robot using android app.

- Limitations of this app is that:

  - The system consists of enabled GPS that would deliver the recipe at closer location, far places delivery won't be under consideration. App allowed deliver functionality only inside the closer location area.
  - My system will perform the functionality of delivering process within a day.
  - Payment would be taken through account, cash payment won't allowed.

1.3 Innovation in project

Innovation is basically intruding fresh concepts to the project. It is a collaborative process where people contribute to implement new ideas for a successful project completion. Additional features included in the project can be called its innovation.

The smart E-delivering robot brings an innovation by controlling the movement of the robot by android application as well. As the market provides the electronic robot for about more than 1lac so another fact regarding innovation of this project is that we are going to use a simple, less expensive robot to convert it into Smart e-delivering robot so that it can be bought in a reasonable price. Furthermore with the help of this results will be more accurate and faster as compared to any other approach

1.4 Applicability in Real Life

Applicability involves that our project is able to be applied in real life. It also defines the areas and limitations where the project can be executed successfully. It mainly refers to implementing the project to be used by the customers.

This project is specifically designed to implement it in area of Sargodha. It would be used by the people of Sargodha so that they can conveniently cook, deliver and purchase their desired meal at their doorstep without taking the help of some ones. After being implemented in this city, we are planning to supply this smart e-delivering robot all over the country in less expenses.

1.5 Complexity

Complexity of a project comprises of the complexity of the whole system used in the project. It adds to the working of the system and what sort of data is being used and in what ways our system is dealing with it. When it comes to deal the complexity it involves the construction of hardware and software ecosystem which provides a maintained system.

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2. Design Considerations

The project entitled "**VIRTUAL COOK**" is a combination of **IoT** and **Android** base logic.

Two phases are involved to design this project objective:

- **Android-based**

  In this project we make an android application that helps others in cooking purposes as well as the delivering purposes via **Robot.** Application would control the robot. People will simply have to install an application on their cell phones to access the available robot at the nearest office. **Robot** would be placed at a specific office from where the people may access their availability through application. We develop this application in **Java language** using a software **android studio**.

  Following step involved in this Phase:-

  1) **Developed feature used within application e.g. GPS tracking functionality.**

2) **Establish a connection between application and chips [2] used in the IOT phase. 3) Graphical user interface for an application**

When any candidate comes, he /she must have to register him/herself on app, **Virtual Cook** will serve them with all information including ingredients, their amount as well as the tutorial for making that recipe. But if he/she is needed to cook the specific recipe this virtual cook app will first ask the users about the available ingredients and will come up with a dish that can be made with those ingredients on its own. In this way, you people can cook, deliver and purchase that dish. So that one can put their dish on app and other can purchase it, according to their will. Buyer has to search whether my wishing recipe are available on this app or not? If the dish is available user check location if the dish is available in between the closer location places, he/she would check the rating of the chefs that would be close to that location and contact via massage to that chef who has high rating among all and thus sellers call the robot, put their dish inside it. The Robot deliver the food to the correct destination and thus the seller has to return back the robot to the office

We develop this phase of application in **Java** language using software **Android Studio**

Following step involved in this Phase: -

- **Home page Activity**
- **Virtual Spinner Activity**
- **Recipe Box Activity**
- **Shopping List Activity**
- **Setting Activity**

IOT based

In this project, we used:

- **Chips** that are connected with our android application.

  For coding in chips, we will use Arduino IDE Software. Chips are placed on Robot which will perform some specific function.
- **Camera [3]** is to be applied in Robot which track the location of the buyer to the seller
- **Sensors [4]** are to be applied that control the cart system.

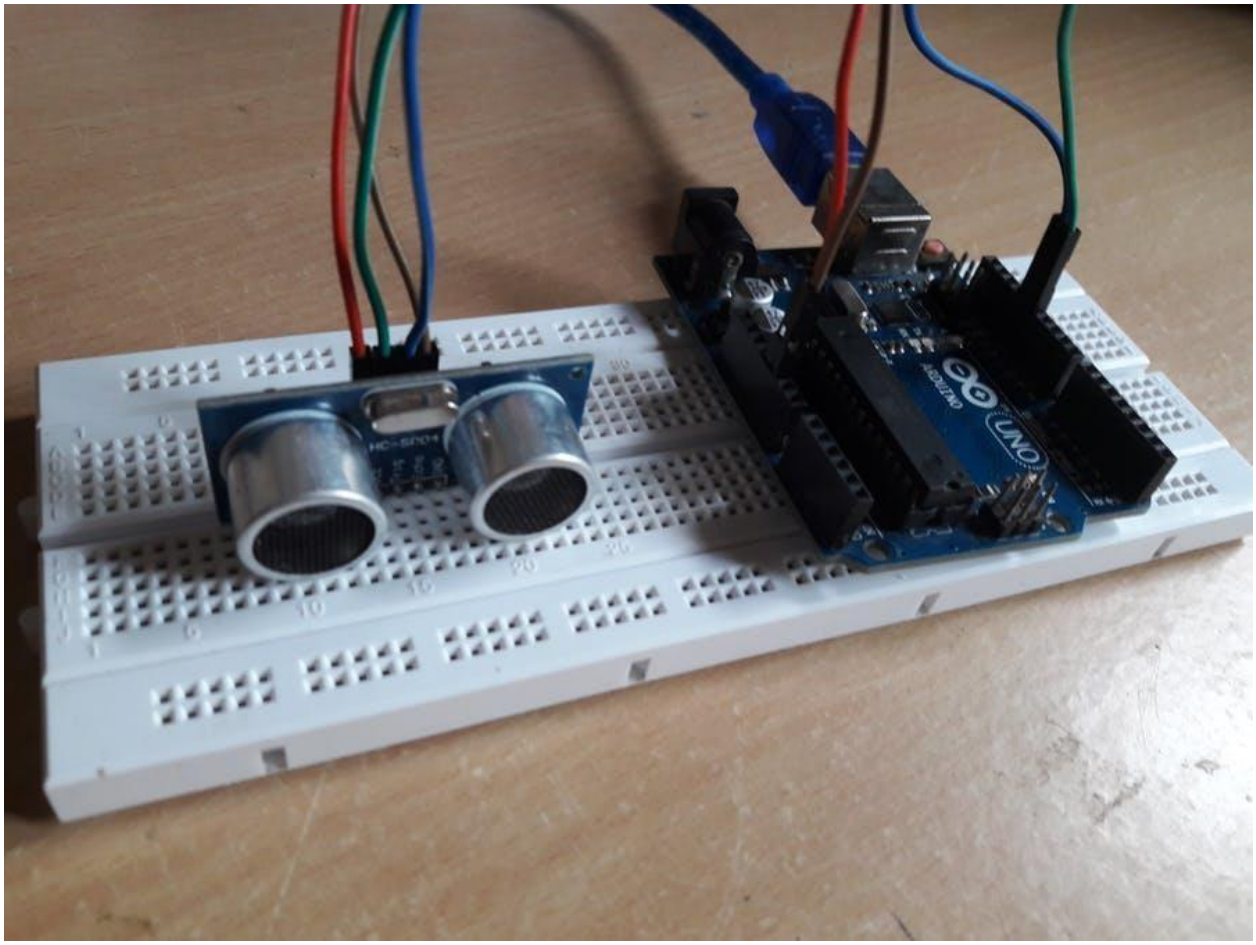


Figure 2-1 High-level concept diagram

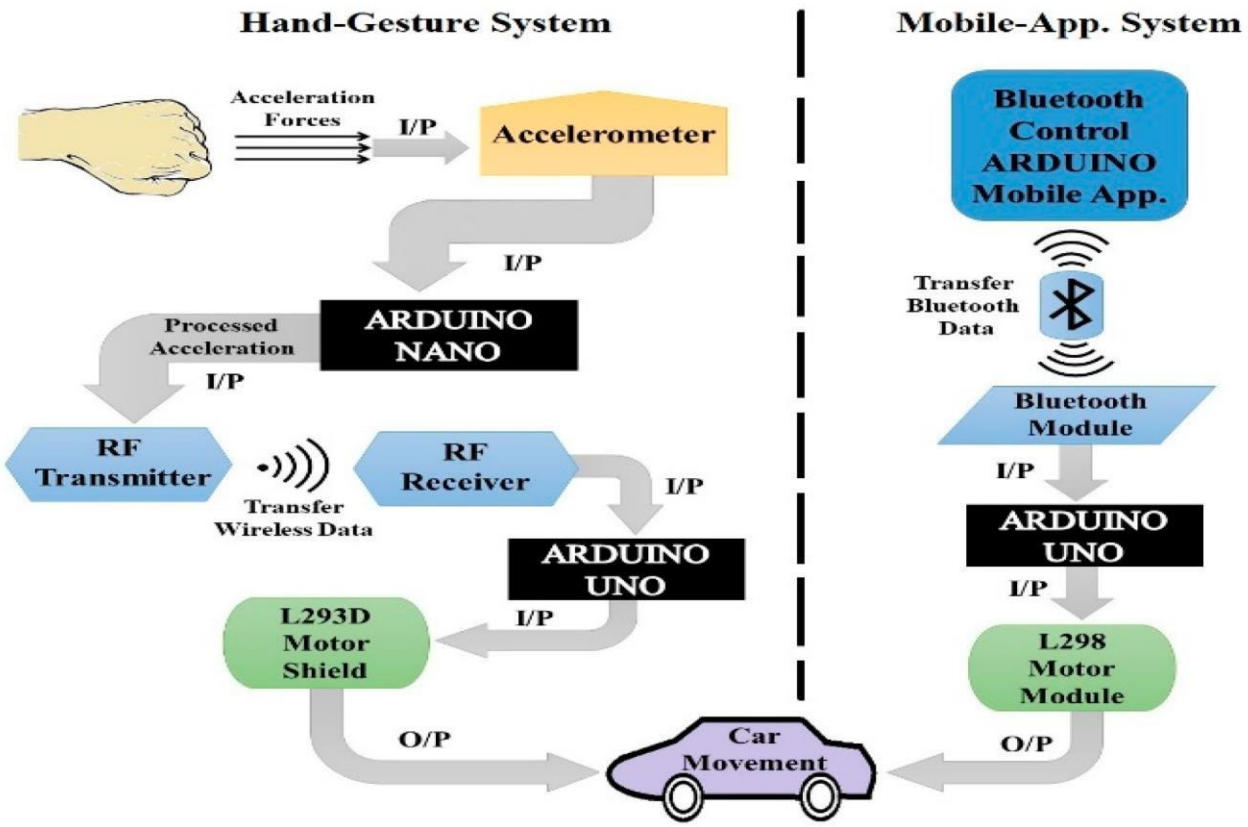
3. System Architecture

Hardware Required			
Serial	**Hardware name**	**Quantity**	**Description**
1	**Arduino Camera VGA CMOS Camera Sensor Module**	1	**Arduino Camera VGA CMOS Camera Sensor Module** is a low-cost image sensor, This camera will be used at delivering robot from where the robot escape from the hindrance in between the way.
2	**Node MCU V3 ESP8266 Based WIFI Development Board**	4	Board is a fast-leading edge low-cost WIFI technology. It is an integrated unit with all available resources on board. Node MCU also called microcontroller. There will a five microcontroller in our project. 1. Main gate microcontroller. 2. Staff parking microcontroller. 3. Student parking microcontroller. 4. Parking gate microcontroller.
3	**Nema17 STEPPER MOTOR**	4	motors will be used in robot
4	**IR Infrared Obstacle Avoidance Sensor**	3	These infrared sensors will be used in robot for sensing left, right, front directions. These sensor will be used to sense either the slots are free or not.
5	**HC SR04 HC-SR04 Ultrasonic Sensor**	2	HC SR04 HC-SR04 Ultrasonic Sensor also called HC-SR04 Ultrasonic Range Finder. Ultrasonic Sensor module HC-SR04 provides 2cm – 400cm noncontact measurement function, the ranging accuracy can reach to 3mm. The modules include ultrasonic transmitters, receiver and control circuit.
7	**5mm Red LED Light Emitting Diode**	12	When slot available it show the color green. If slot not available it shows the color red.

8	**wires**	4 dozen	Wires will be used to connect hardware with each other physically.

Software Required

Serial no	Software	Task to be implemented
1	**Android studio**	Android Studio is the official integrated development environment (IDE) for Android application development. It is based on the IntelliJ IDEA, a Java integrated development environment for software, and incorporates its code editing and developer tools. We will use it to design the interface of our application. It also used to connect application with database. We will also use it for image process coding in python.
2	**SQL Database**	SQL database will be used to store the table's information.
3	**Arduino IDE**	Arduino is defined as an open-source electronics platform which consists two parts: hardware and software. In the first part, Arduino boards (hardware) are capable to read the inputs of physical quantity such as light variation by using light sensor, movement changes by means of movement sensors, recognition of vocal variation using Bluetooth application. Secondly, it turns it into an output. We will use it for coding to connect hardware parts with each other that they will communicate with each other.



Virtual Cook provide **Robot** that would provide the delivery functionality at people's doorsteps.

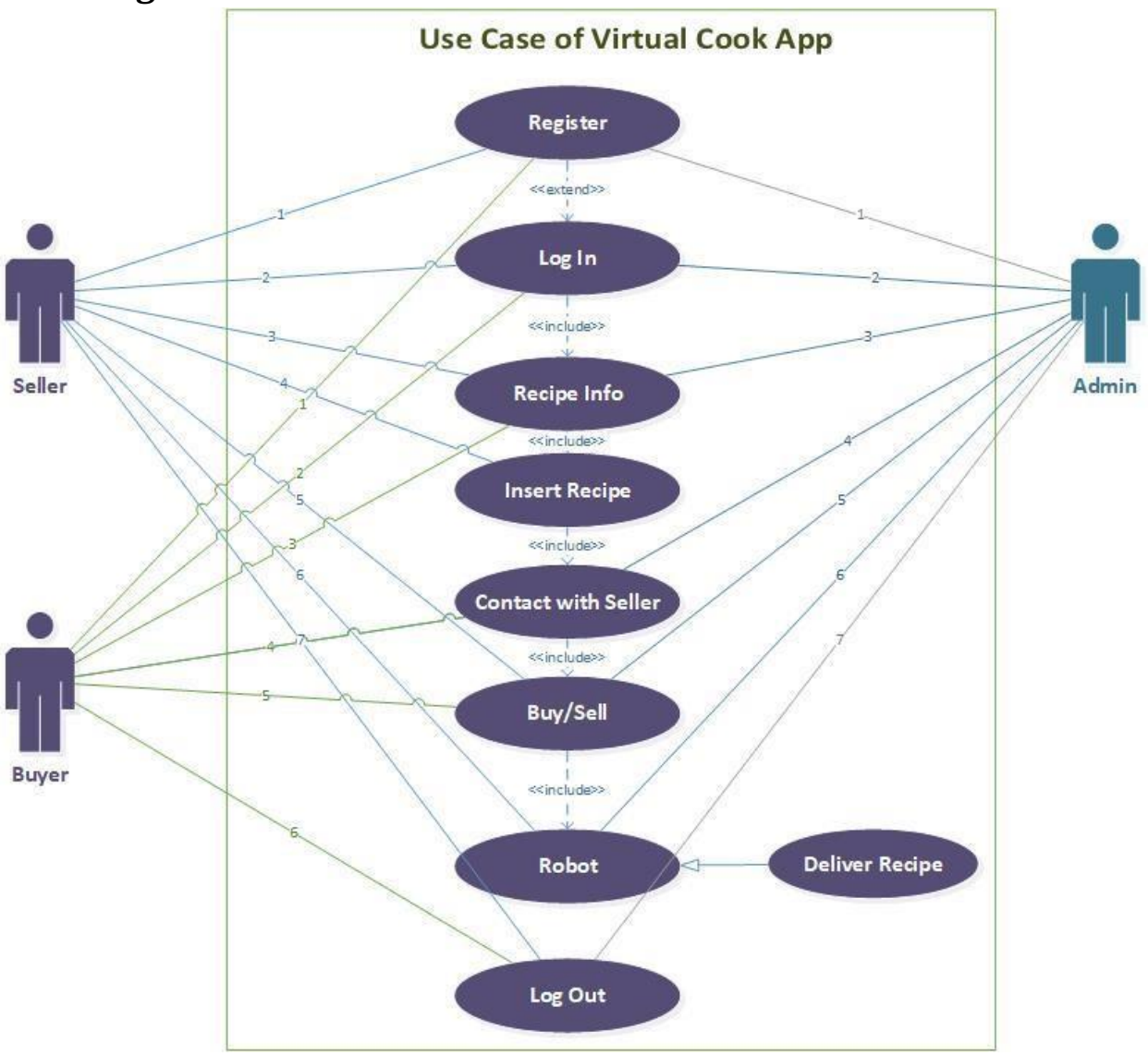
- They can buy the food by using delivery robot at their nearest office.
- Robot would be placed at a specific office from where the seller may access their availability through application **Sensors**
- The sensors can detect the hurdles.
- An alarm start ringing when a hurdle occur. **Camera**
- The camera is also used in the robot to see the hurdle.

2.3.2. Software Requirement

Sr.No	component	Description
1	Software used in project	Arduino, Android studio

Table 3: The Table of Components

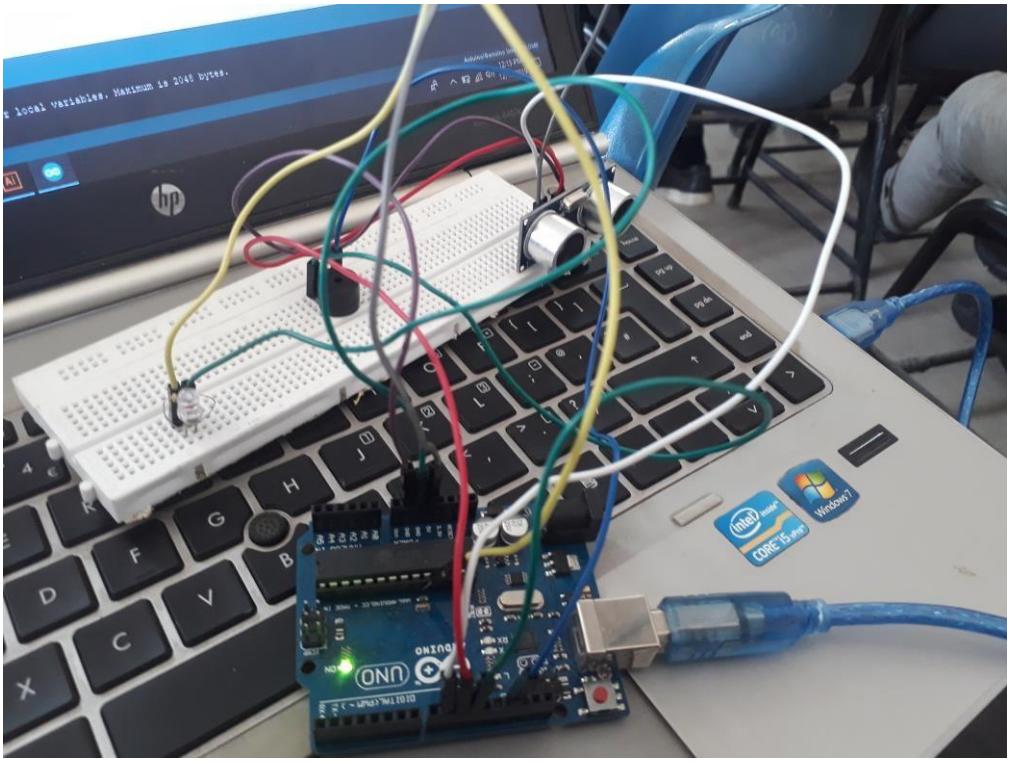
3.1.1 Use case Diagram of Virtual Cook :



3.2 Sub-System / Component / Module Level Architecture

3.2.1 Sensors Management:

In-ground sensors that monitor and report soil moisture levels. Must be connected directly to the central control unit and must be placed in the ground in close proximity to an irrigation zone.



4. Design Strategies

An automatic irrigation control system has been designed to facilitate the automatic supply of adequate of water from a reservoir to field or domestic crops in all agricultural seasons. One of the objectives of this work is to see how human control could be removed from irrigation and also to optimize the use of water in the process. The method employed is to continuously monitor the soil moisture level to decide whether irrigation is needed, and how much water is needed in the soil. A pumping mechanism is used to deliver the needed amount of water to the soil.

4.1 Strategy 1

Home page activity having all recipes information along with tutorial.

4.2 Strategy 2

Virtual Spinner activity including a spinner of ingredients by which the app will first ask the users about the available ingredients, ask the available time in which the user can cook recipe easily and then there will come up with a dish that can be made with those ingredients within a specific time.

4.3 Strategy 3

In **Recipe Box activity**, it would be a box, where the user store their wish list and can use it later in future so that the user won't have to search same dish-type and ingredients again and again.

4.4 Strategy 4

The another important feature is **Shopping List**, all the ingredients are mentioned over there that would have been used in user's recipe, if the user doesn't have all necessary ingredient as such that some are missing among them so in this way, user can save those missing ingredients in their Shopping List and can purchase those ingredients from the shop as well.

4.5 Strategy 5

The last one is setting activity where the user can logout from app and can also change other functionality i.e. language functionality.

4.6 Strategy 6

Upcoming Hindrance Alerts

The sensor utilizes to avoid hindrance on the way. However, this method is only useful when robot is actually facing a hindrance. A hindrance alert feature could alert the user so that they can turn away the robot from the hindrance. We use this feature in future work.

4.7 Strategy 7

Resource and Schedule Analysis

The resource requirements necessary for android and arduino have been evaluated to determine the outcome of completion.

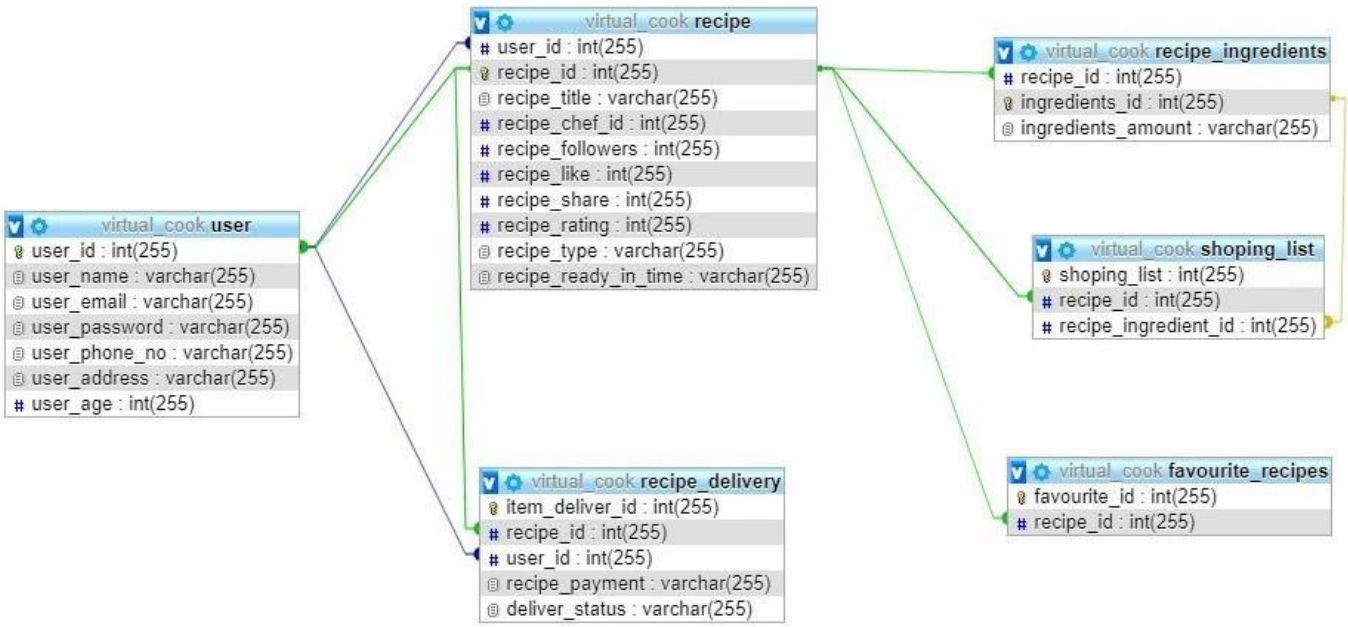
For scheduling analysis we determined our project characteristics like

- Android •
- Arduino

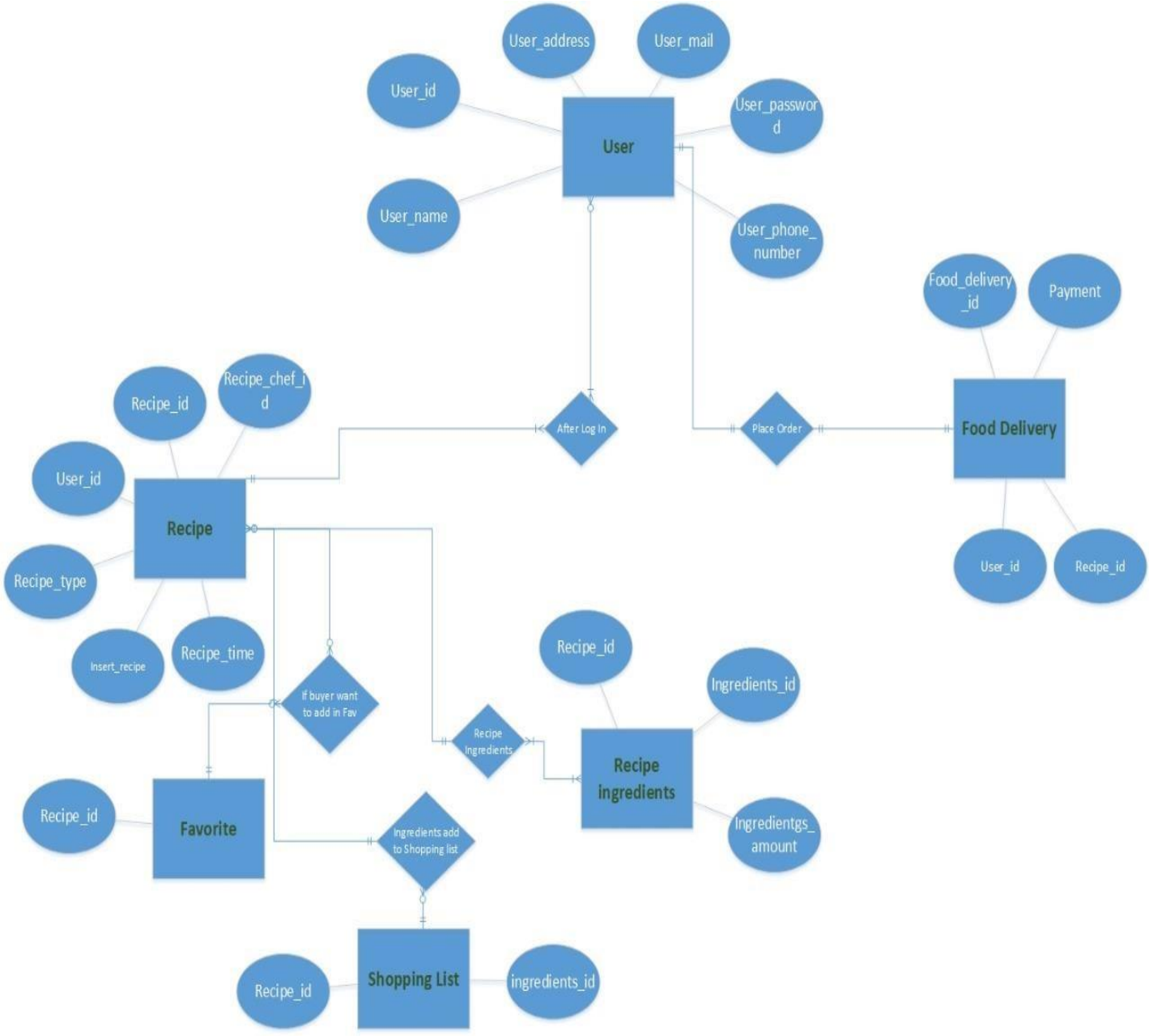
5. Detailed System Design

Database Design for Virtual Cook System

5.1 ERD Diagram of Virtual Cook:



5.2 Entity-Relationship Model of Virtual Cook:



Normalization

First normal form

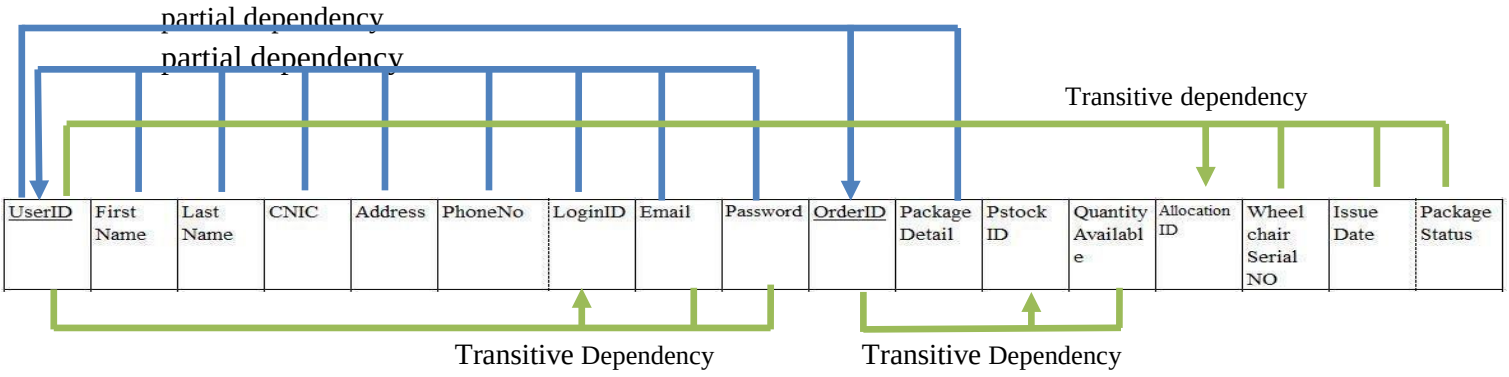
A relation is in **first normal form (1NF)** if the following two constraints both apply:

1. There are no multivalued attributes in the relation.
2. A primary key has been defined, which uniquely identifies each row in the relation.

Both conditions have been satisfied as there are no multivalued attributes in table and a composite key user_id and recipe_id has been defined so it is in first normal form.

UserID	First Name	Last Name	CNIC	Address	PhoneNo	LoginID	Email	Password	OrderID	Package Detail	Pstock ID	Quantity Availabl e	Allocation ID	Wheel chair Serial NO	Issue Date	Package Status

Dependencies



Second normal form

In 2nd NF we remove partial dependency.

RECIPE

OrderID	UserID	PackageDetail

Transitive dependency

UserID	First Name	Last Name	CNIC	Address	PhoneNo	LoginID	Email	Password

Transitive dependency

UserID	RecipeID	RecipeDetail	Pstock ID	Recipe Ingredinets	Allocation ID	Recipe ID	Issue Date	Package Status

Transitive dependency

Third normal form

In 3rd NF, we remove transitive dependency.

USER

UserID	FirstName	LastName	CNIC	Address	Phone No

RECIPE

OrderID	UserID	RecipeDetail

RECIPE_INGREDIENTS

PstockID	OrderID	QuantityAvailable

RECIPE_DELIVERY

PstockID	QuantityAvailable	AllocationID	Recipe_id	IssueDate	PackageStatus

FAVOURITE_RECIPE

PstockID	Recipe_ingredients	AllocationID	Recipe_ID	IssueDate	PackageStatus

SHOPING_LIST

PstockID	OrderID	QuantityAvailable

6. References

Ref. No.	Document Title	Date of Release/ Publication	Document Source
AICS-17-Proposal	Project Proposal	Oct 23, 2020	D:\Drive D\Sehrish Talat
AICS-17SRS	Software Requirement Specification	Jan 06, 2020	D:\Drive D\Sehrish Talat