

An aerial photograph of a rural landscape featuring green rice fields, a small pond, and a dense forest. A black rectangular overlay is positioned on the left side of the image, containing the title and a reference number. A white line connects a point in the forest to the top-right corner of the black overlay.

Agriprenuers

2021-090

Team



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Background

- High impact on families with middle to low income.
- Extra source income is always welcomed.
- Entrepreneurship is a high-risk domain.



Figure1: <https://www.pewresearch.org/social-trends/2020/09/24/economic-fallout-from-covid-19-continues-to-hit-lower-income-families-the-hardest/>

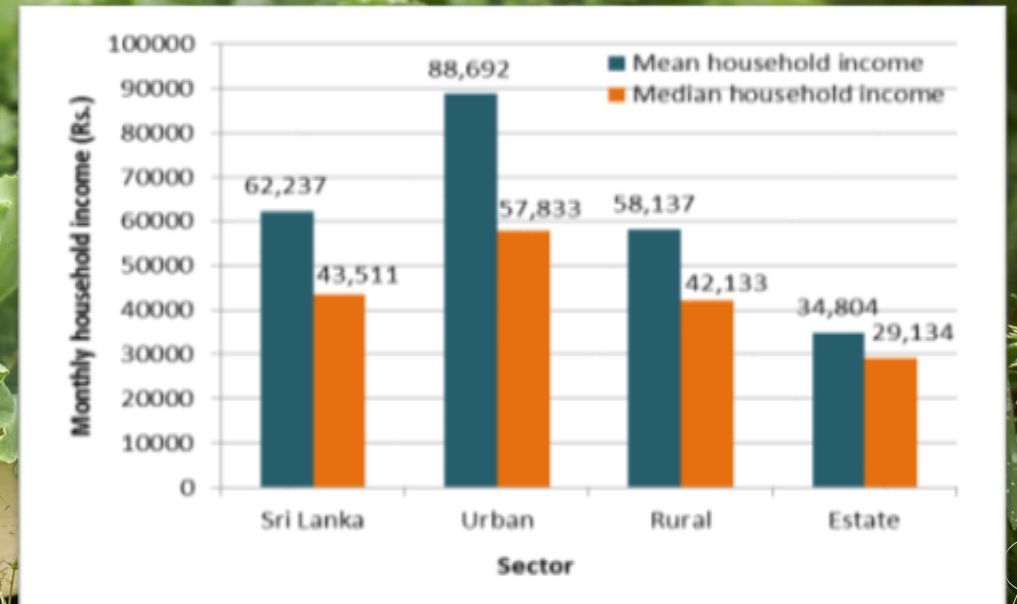
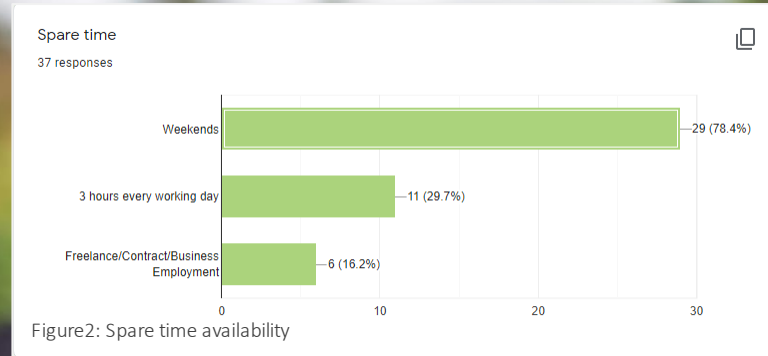
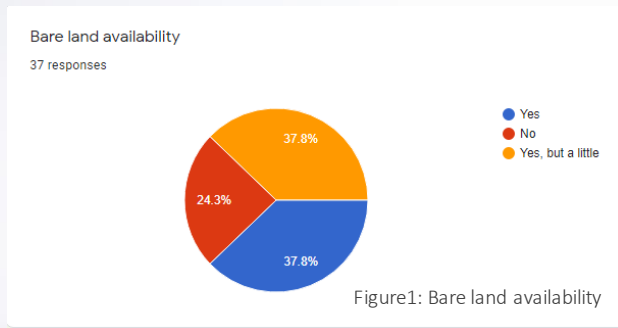


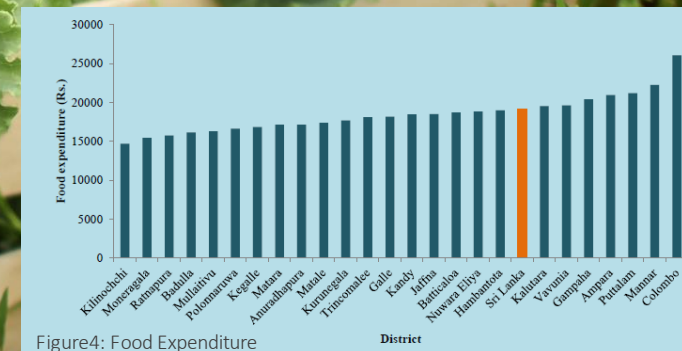
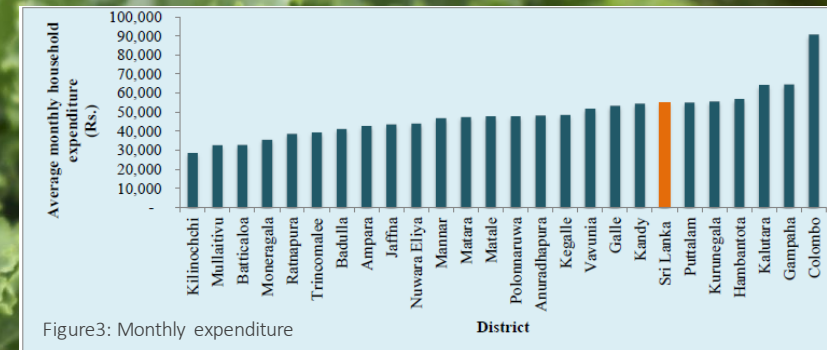
Figure2: Department of Census and Statistics Sri Lanka, 2016



- High risk in Entrepreneurship domain.
- Less motivational strategies to promote entrepreneurship.
- No proper tool to promote entrepreneurship.
- Unavailability of stable values of a success rate figure to motivate a person to be involved in a business.
- Not utilizing bare land in many households, due to lack of time.

Research Problem

- Under Utilizing the scope of the Agriculture Domain in Urban areas
- Less motivation and promotion for entrepreneurship.



Objectives

Main

- Motivational Model for End Users to become self made entrepreneurs.

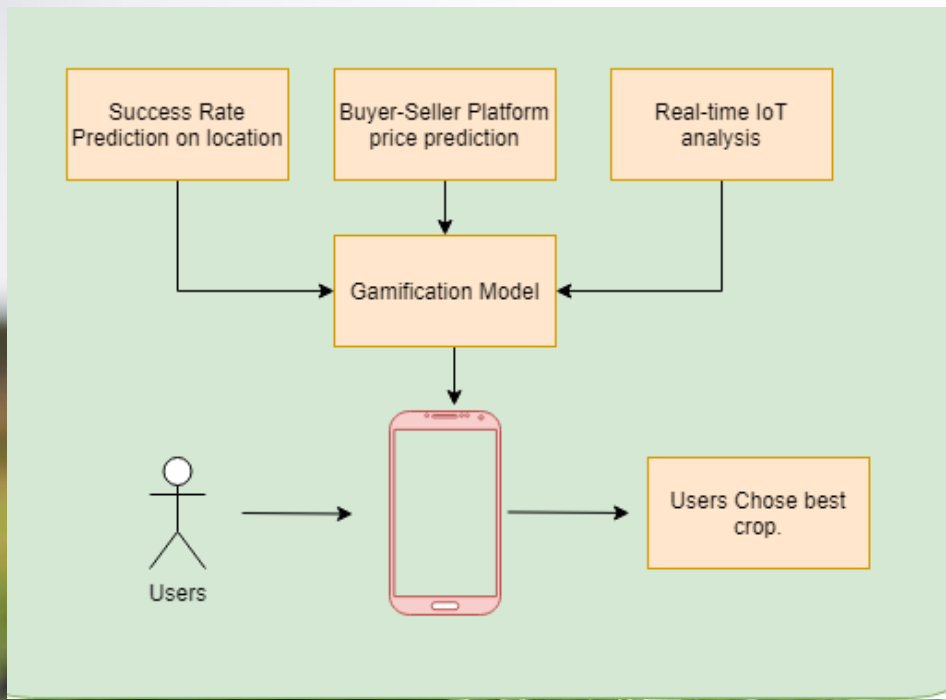
Sub-objectives

- Gamification model.
- Realtime data analysis IoT model.
- Success rate prediction model with location.
- Market Rate prediction model with time.

Other Objectives

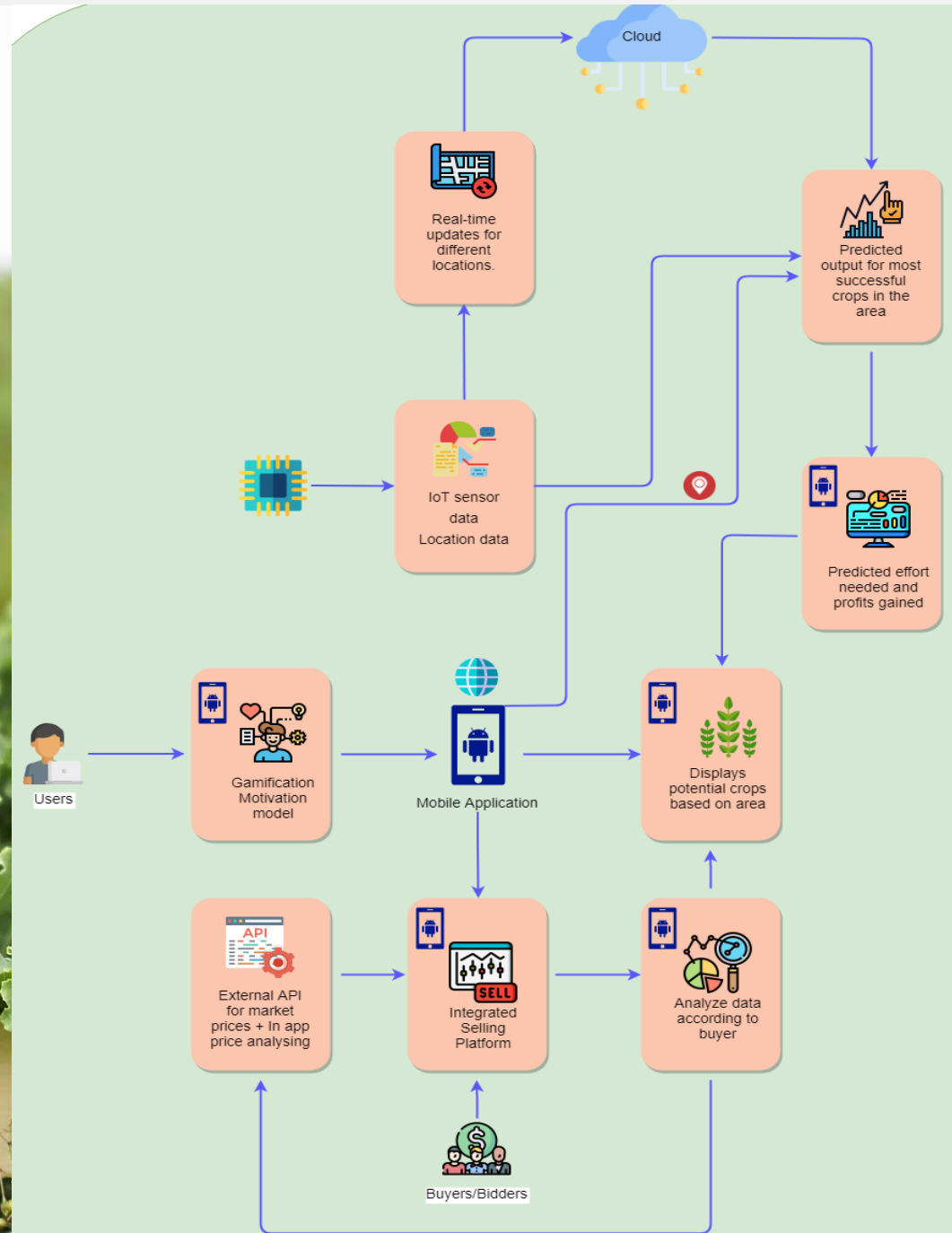
- Social acceptance.
- Regional leaderboard implementation.
- Reward Scheme.
- Auction Platform.
- Robust image processing model.





System Overview Diagram

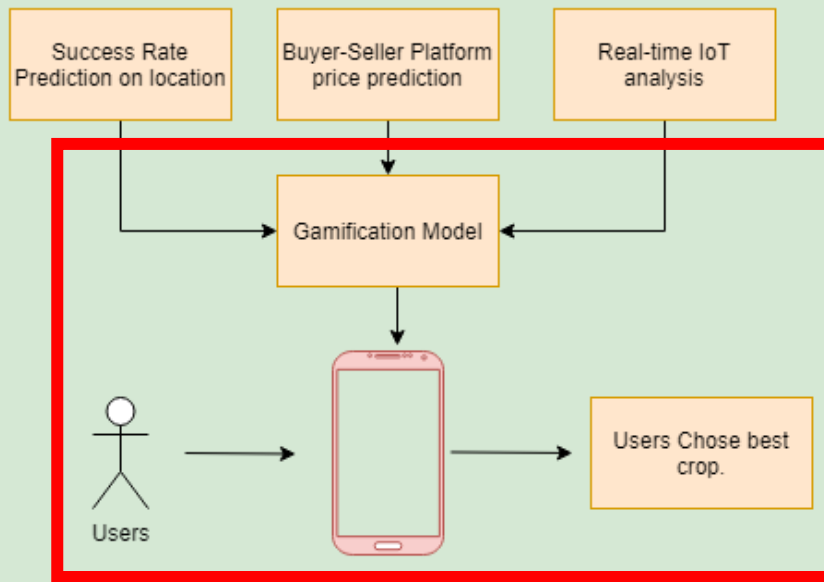
- 2 Prediction Models with the help of Machine Learning
- 1 IoT Analysis Model
- Gamification Model



IT18111170 | Silva S.H.I

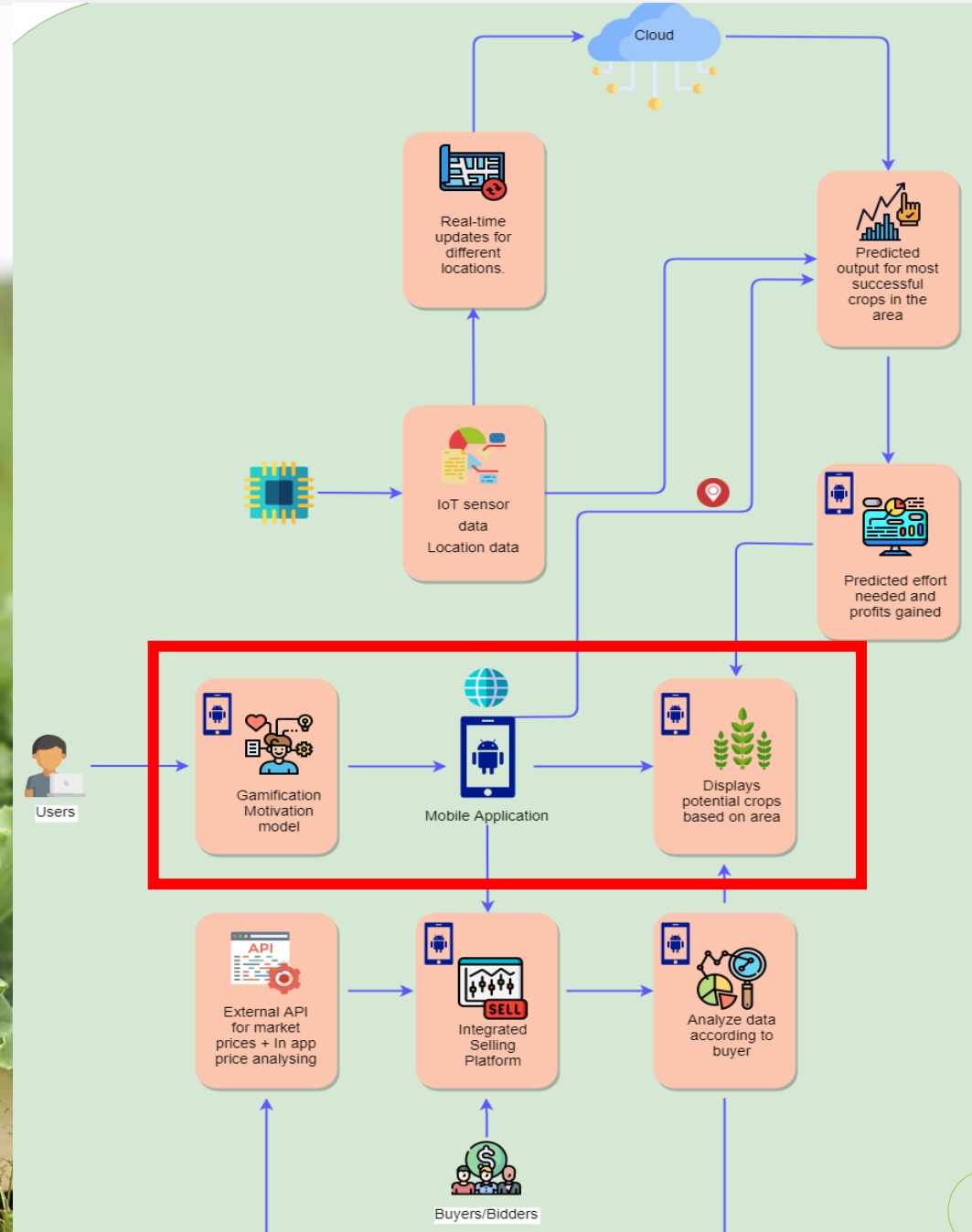
Specialization: Software Engineering





Gamification Motivation Model

- Gamification Model
- Leaderboard & Reward Schema
- Motivational Psychological model



Introduction

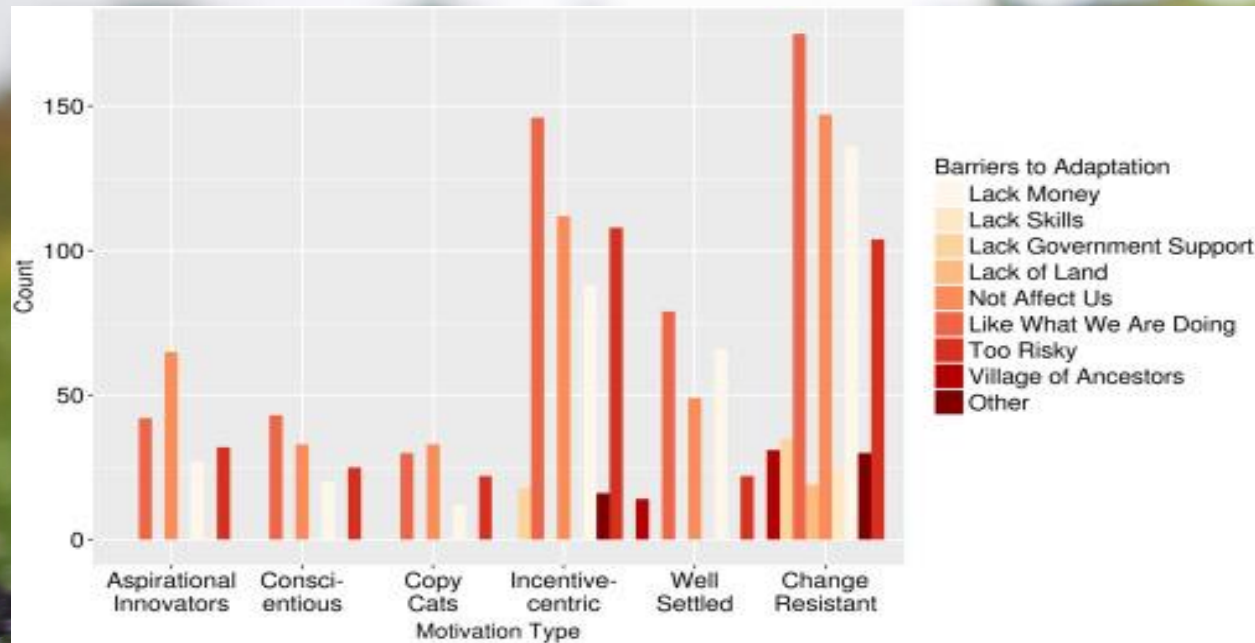


Figure: Motivation type against Barriers to adaption

Background and Research gap

- People are lazy to motivate and become entrepreneurs in agriculture even they are eligible
- Some motivational model in agriculture can be found but Mobile App using Image understanding and processing with psychology aspect are very less.
- Implement Mobile Application with considering the psychology motivational aspects including Gamification reward model.



Main Objective

- Motivate users to become self-made entrepreneurs and sustainable in economy.
- Create gamification model to addict and motivate users

Sub Objective

- Create regional Leaderboard which shows ranks of users based on district
- Create reward model proving discounts on taxes using points for user to addict and motivate.

Research Problem

- There is lack of motivation on Agriculture for individuals to become entrepreneurs. Even if they are eligible

Research Methodology

Technologies, Techniques

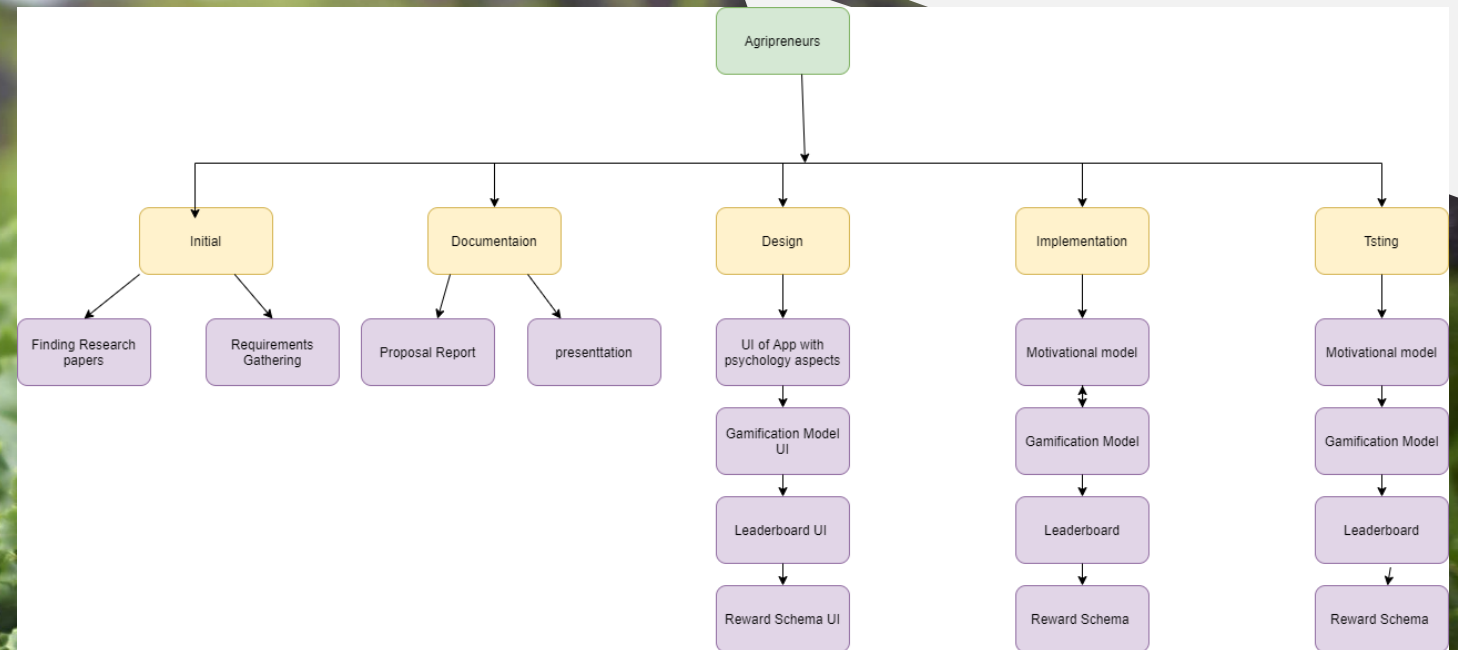
- Mobile App with React native frontend with Python Django framework for Backend
- Used OpenCV library with Python for Image understanding and processing
- Firebase-Database
- Tools- VS code, Emulators

System, Software Requirements

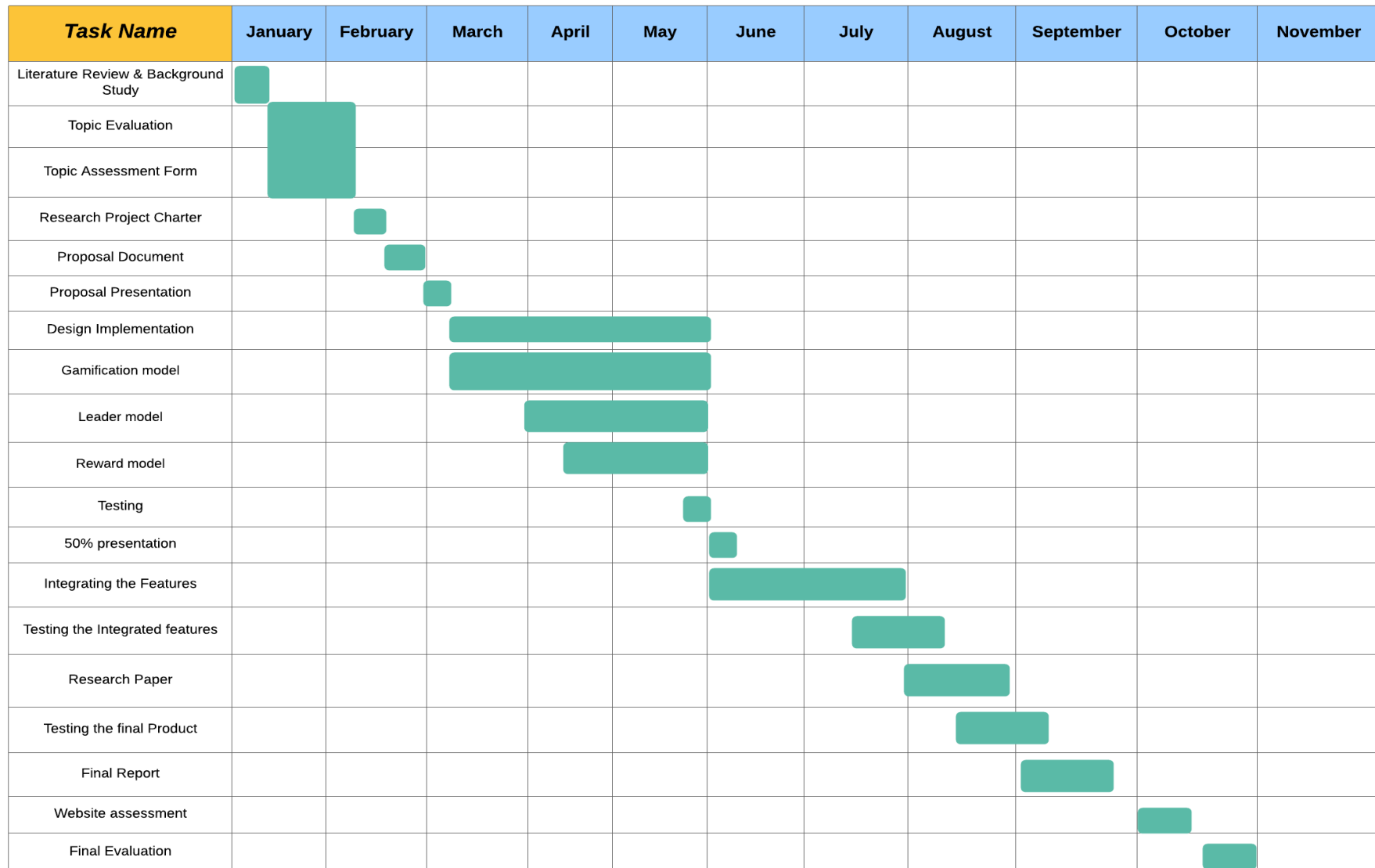
- Smart Phone with camera features and GPS.
- Success rate details of Crops.
- Crops that get highest sales rate in market.
- Non -Functional- Usability Accuracy And performance, Social Acceptance

WBS

- Create homepage, add users, login according to psychological motivational aspects
- Create gamification model with Image understanding and processing where user can interact with images
- Create leaderboard with represent users ranks according to the points they made
- Reward schema for user according to the rank they will get discount taxes of mobile App charges



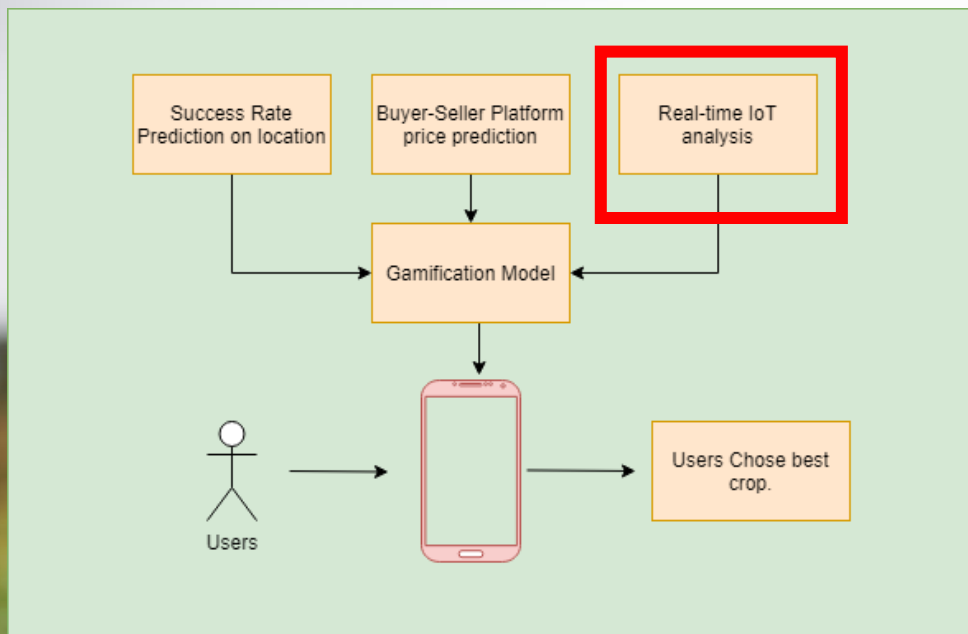
Gantt chart



IT18027334 | Thilekarathna P.D.M

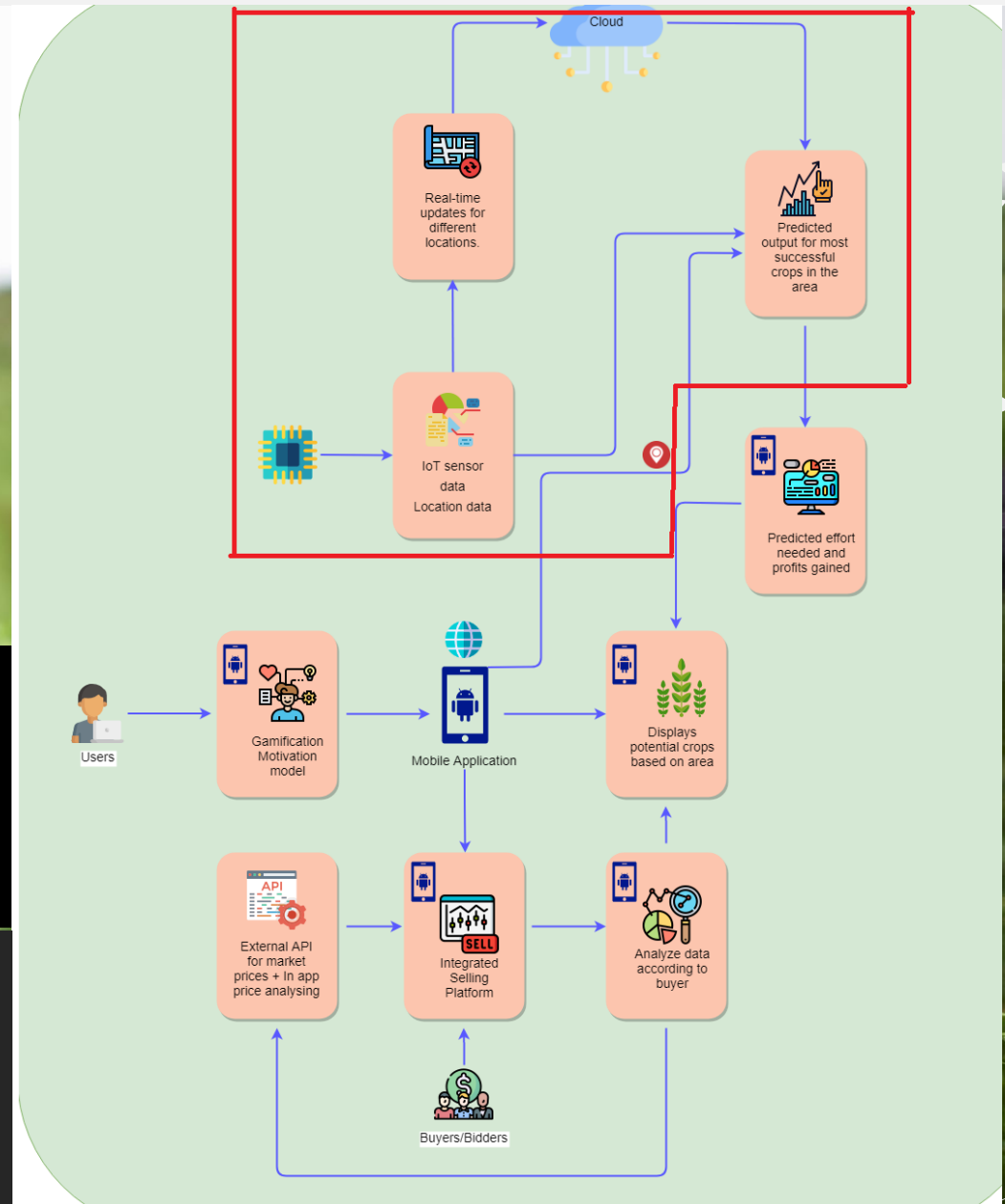
Specialization: Computer Systems & Network
Engineering





IoT based data analysis model

- ✓ Identify suitable areas of the land
- ✓ Data analysis model of the suitable crops to be grown
- ✓ Real time data analysis



INTRODUCTION

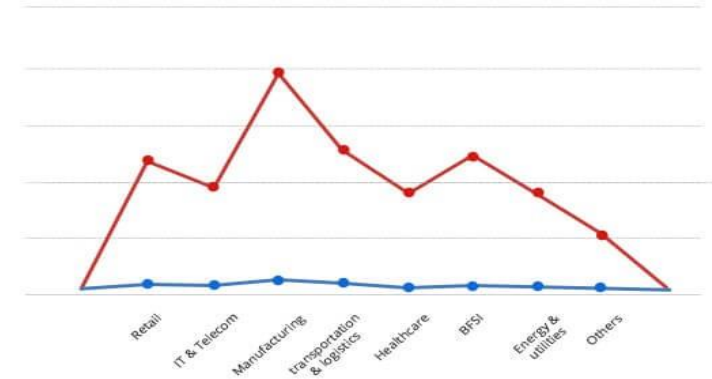
BACKGROUND

IOT APPLICATIONS IN REAL WORLD.....

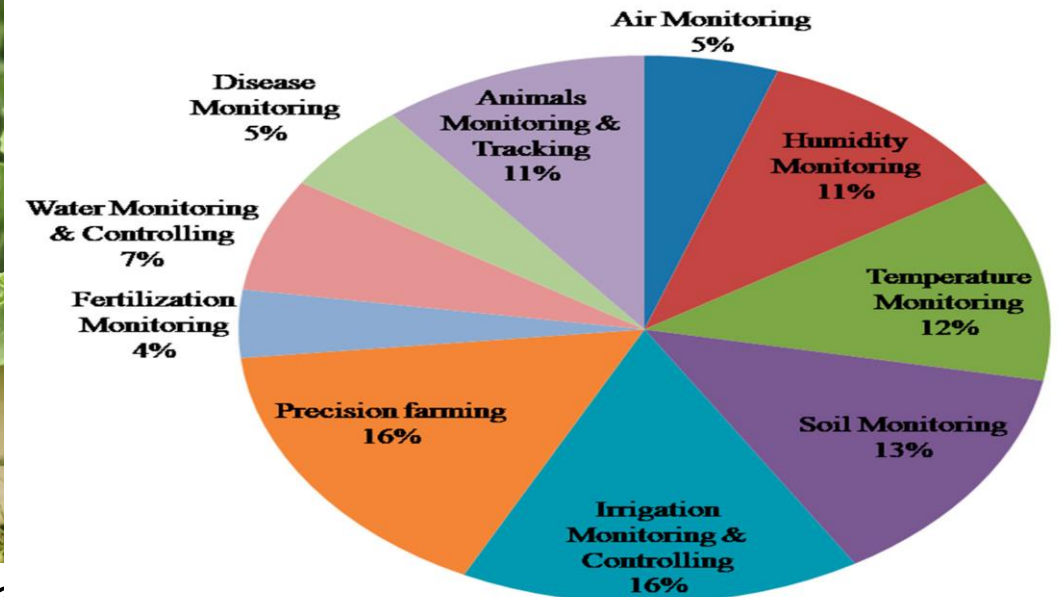
- ✓ Health.
- ✓ Wearables.
- ✓ Traffic monitoring.
- ✓ Agriculture.
- ✓ Hospitality and so on.
- IoT plays a major role in agriculture domain which have ability to feed 9.6 billion populations on the earth by 2050.

GLOBAL IOT MONETIZATION MARKET
BY INDUSTRY VERTICAL

2017 2025



MANUFACTURING hold a dominant position in 2017 and would continue to maintain the lead over the forecast period.



RESEARCH GAP

Already existing systems are utilizing IoT methodologies;

- ✓ New type of devices
- ✓ Enables all smart farms to be connected

BUT LACK OF,

IoT methodology for motivate non- farmers.....

LESS EFFECT = MORE PROFIT

	Mobius using &Cube	Smart Agriculture app	Green Farm- DM	FieldChe ck App	Agripreneurs
Using IoT sensor data to best crop prediction	NO	NO	NO	NO	YES
Real time update	YES	YES	YES	YES	YES
Motivation al model	NO	NO	NO	NO	YES

RESEARCH QUESTION

- How does IoT effect to Motivate People to growing crops?
- How to motivate non-farmers using IoT methodologies?

MAIN OBJECTIVE

- Building a IoT based data analysis model to predict the most suitable crop in the specific bare land

SUB OBJECTIVE

- IoT data analysis model to identify suitable areas of the land.
- Data analysis model to predict the suitable Crops.
- Real time update.

RESEARCH METHODOLOGY

Technologies, Techniques

- NodeMCU development board as the Microcontroller
- Programming language- Python
- Database – Firebase
- Algorithms(seeking..) -LSTM RNN / Linear Programming (LP)

Functional	Non-Functional
Fast and reliable updates	Acceptance from society
High Accuracy	Motivating every user
High Usability	Least Effort needed

System, Software Requirements

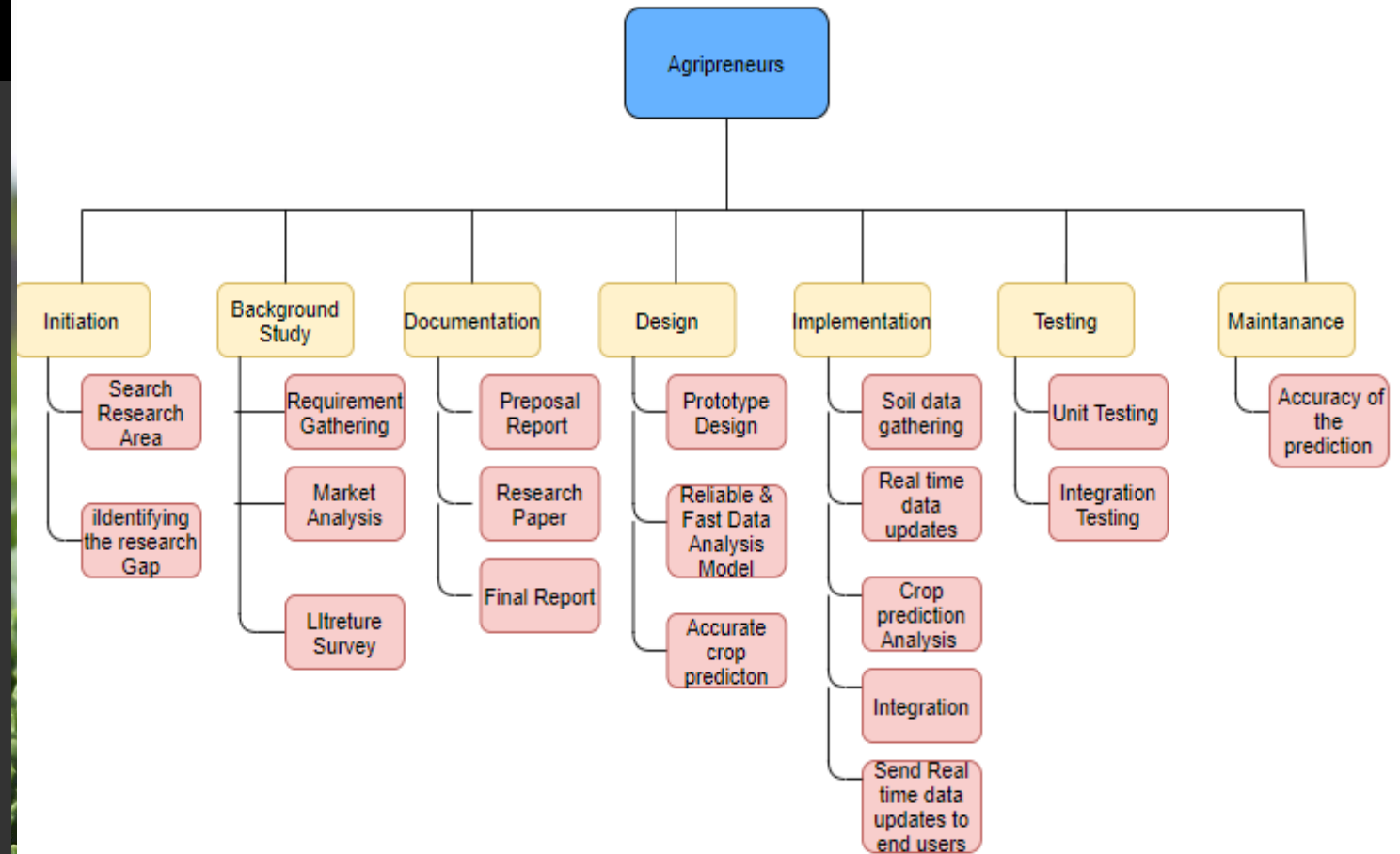
- Network gateway need to be act as an intermediate.
- Humidity and temperature sensors.
- Mobile Application.
- MQTT (standard publish/subscribe protocol)

Data Sources

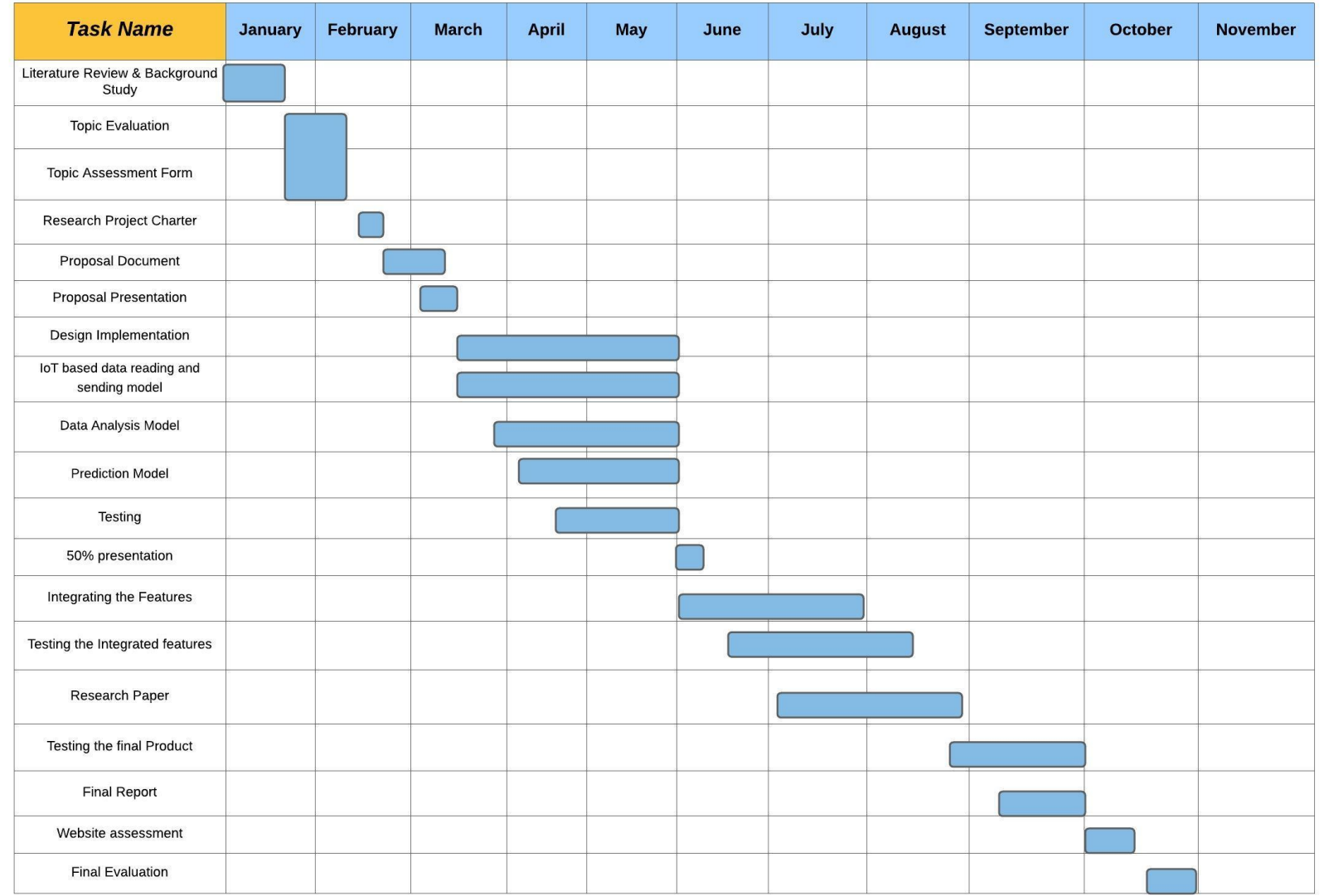
- Open data portal Sri Lanka
- NAICC- Govikam Magazines
- Department of Agriculture Srilanka Website

WORK BREAKDOWN STRUCTURE

- Retrieve soil data from IoT sensors.
- Send the data into cloud environment via network gateway.
- Train a data analysis model to make crop predictions.
- Develop the system to make aware of end users by sending real time data updates.



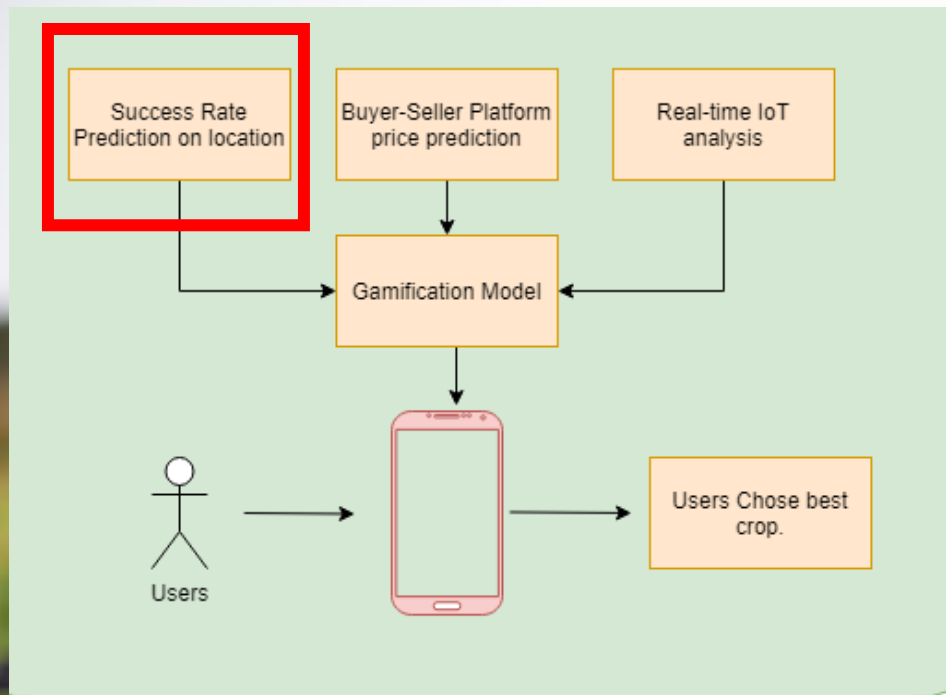
Gantt chart



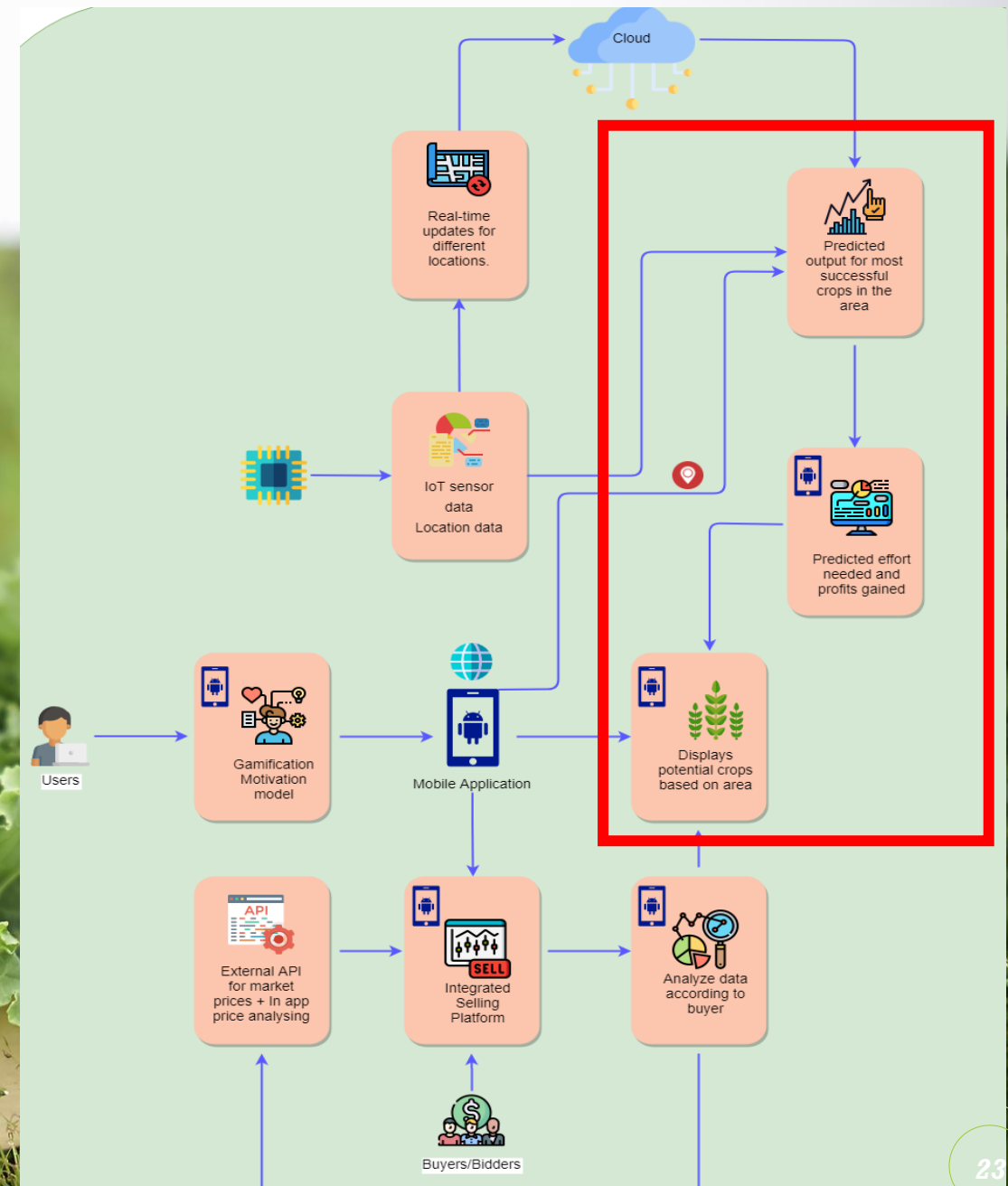
IT18110562 | R.S.W.M.R.L. Rangalla

Specializing : Software Engineering





Prediction of Success Rate Figure



Background

- Prediction machine learning mainly involves in the supervised machine learning domain
- Detect abnormal crop groups due to diseases.
- Machine learning prediction algorithms have been evolving to give more predictive and accurate results.
- Image processing technology had evolved

Research Question

- To build a prediction model, analysis the data of the user's location, IoT data and data within the application.

Research Gap

- **Success rate prediction model** according to data analyzed from the application itself.
- **Success rate prediction model** will predict data according to the location of the user using the application and IoT devices
- Robust image processing model to detect disease and give solution by fertilizers.

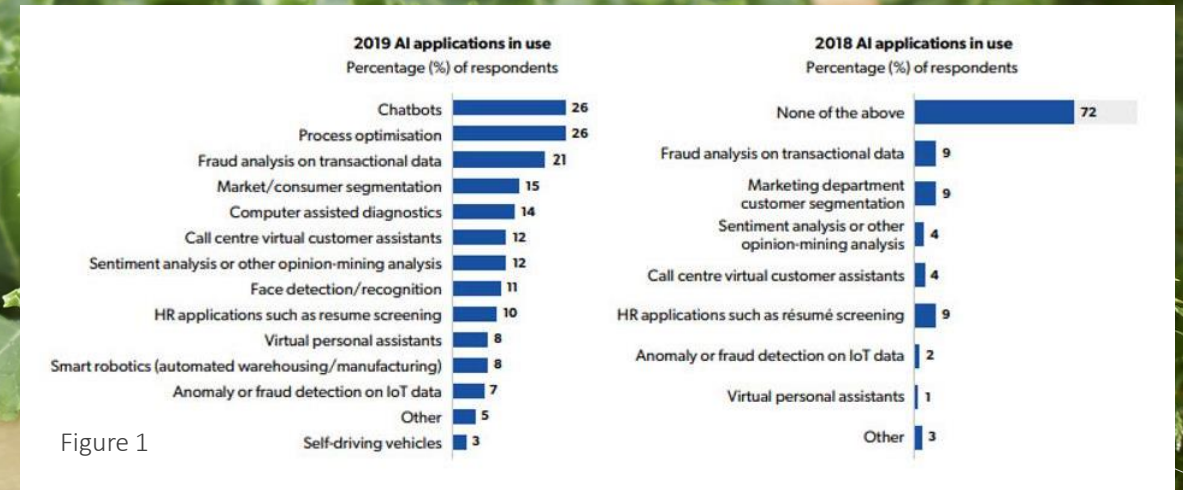
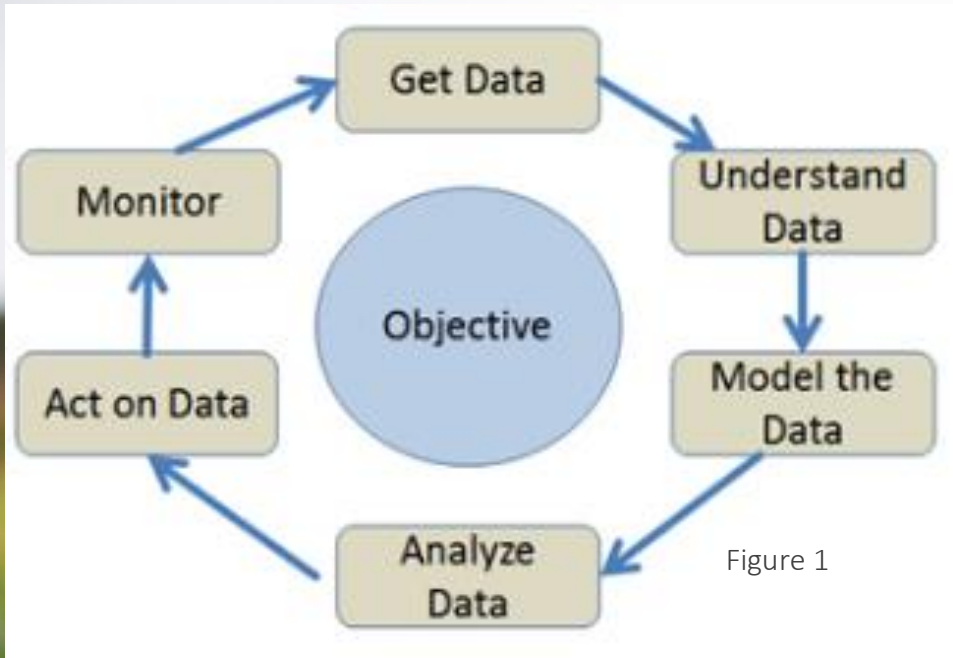


Figure 1



Objectives

- To make a motivational model for end users.
- Using Machine Learning algorithms to provide a Success Rate prediction and Profit prediction.

Sub objectives

- Using classification and regression algorithms.
- Using Multiple Regression analysis algorithms to predict a success figure according to the Location of user.
- Robust image processing model.
- Detect abnormal plants by analysis the uploaded picture.
- Provide appropriate solutions/fertilizers.

Tools and Technologies

Mobile application, to be easily and always accessed by users.

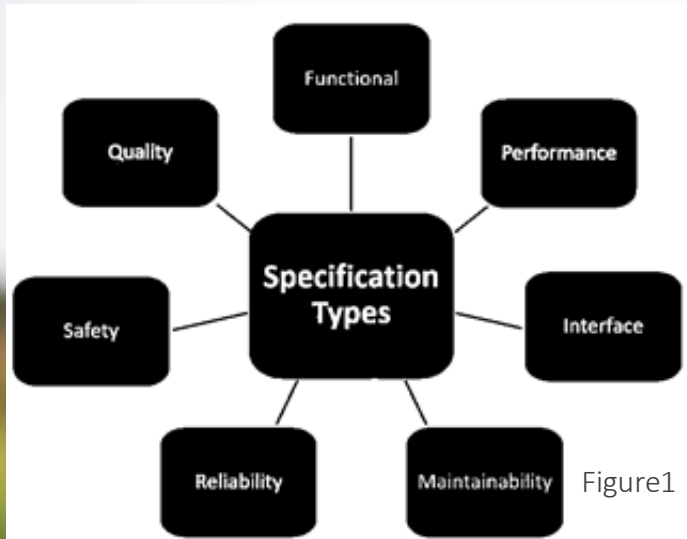
- React Native – FrontEnd
- Python Django Framework – Backend
- Firebase – Database
- OpenCV – Process images

Tools : Visual Studio Code , Emulator

Algorithms

- NB algorithm(Naïve Bayes Algorithms)
- K Nearest Neighbor
- Collaborative Filtering





Functional	Non-Functional
High Reliability	Acceptance from society
High Accuracy	Motivating every user
High Usability	Least Effort needed

Requirements

System Requirements

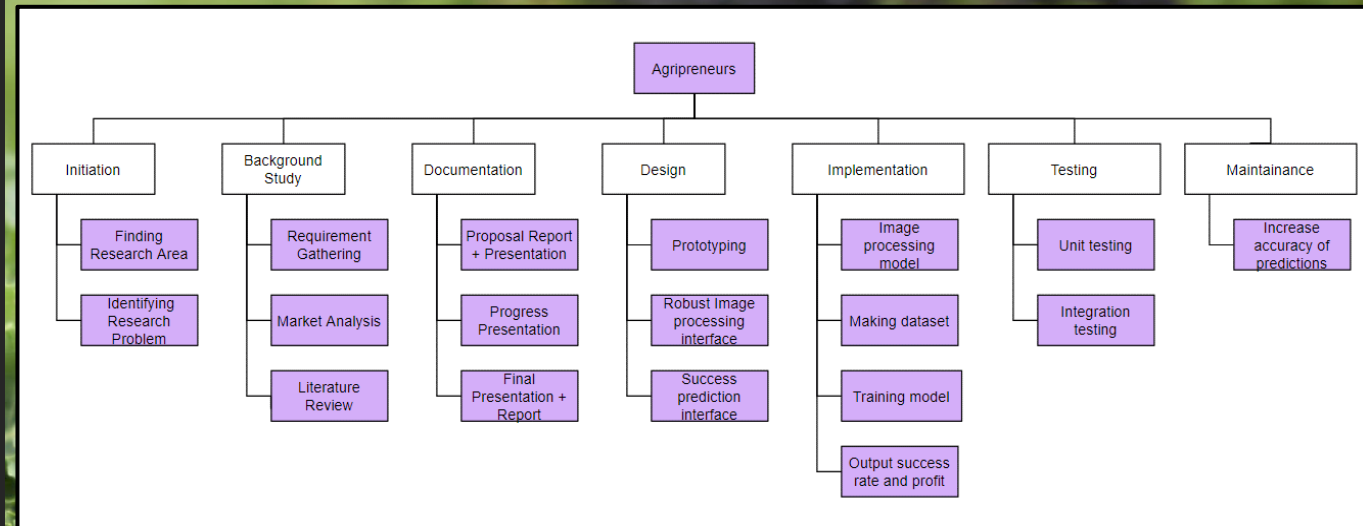
- Internet
- GPS
- Smart Android Phone
- Motivational UI/UX interfaces

Personal Requirements

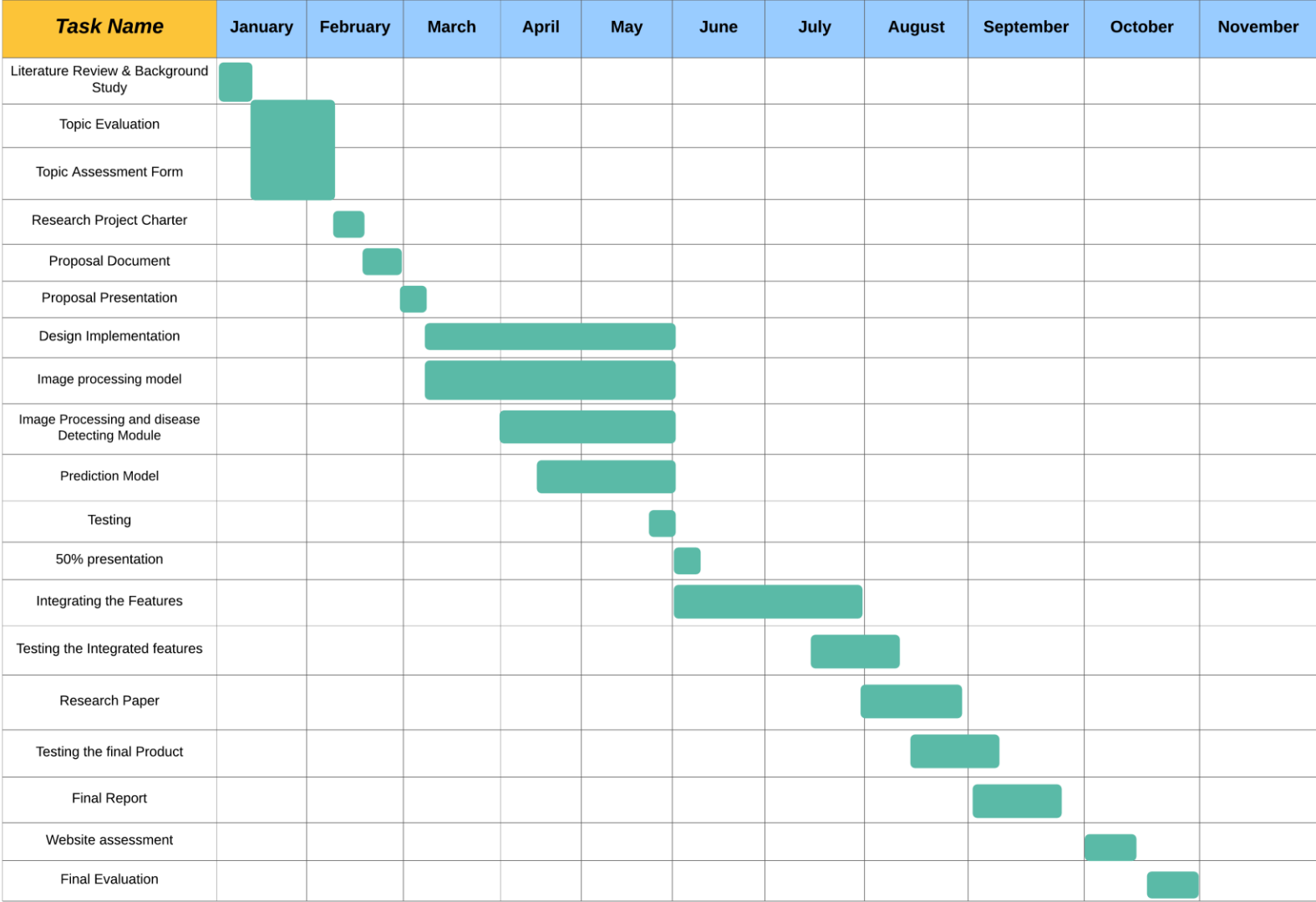
- React Native, Python , SQL databases, OpenCV
- Making clean dataset
- Training machine learning algorithms
- Research on psychology of users.

Work Breakdown Structure

- Develop interactive and high motivational/addictive interfaces with best user experience.
- Develop interface for image processing functionality.
- Develop robust image processing functionality.
- Making dataset for predictive algorithm.
- Training model and testing better algorithms.
- Success figure and profit output



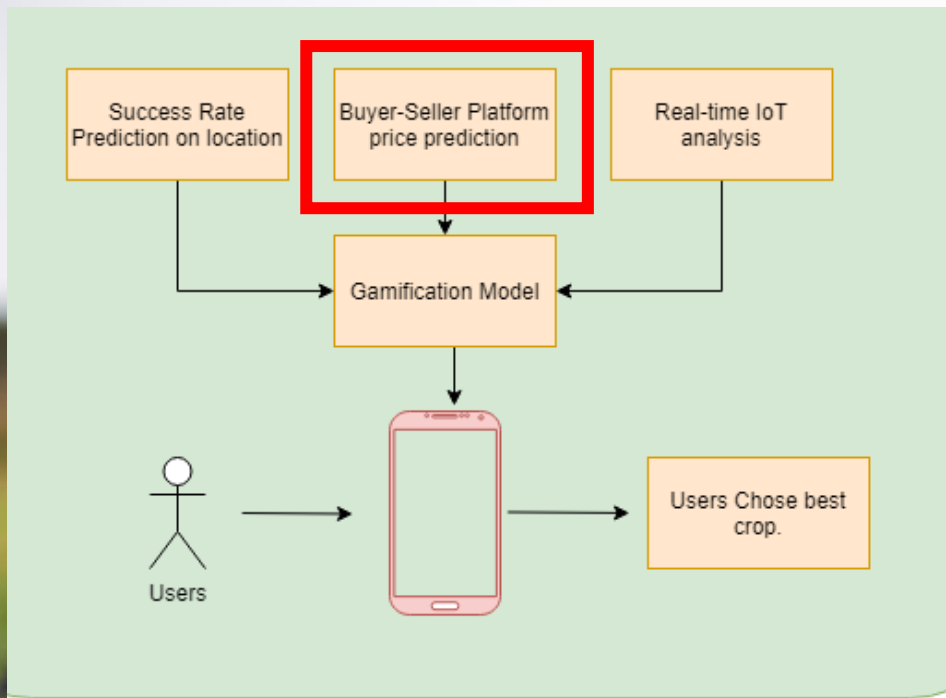
Gantt Chart



IT17023610 | A.G.J.L.P Rajapakse

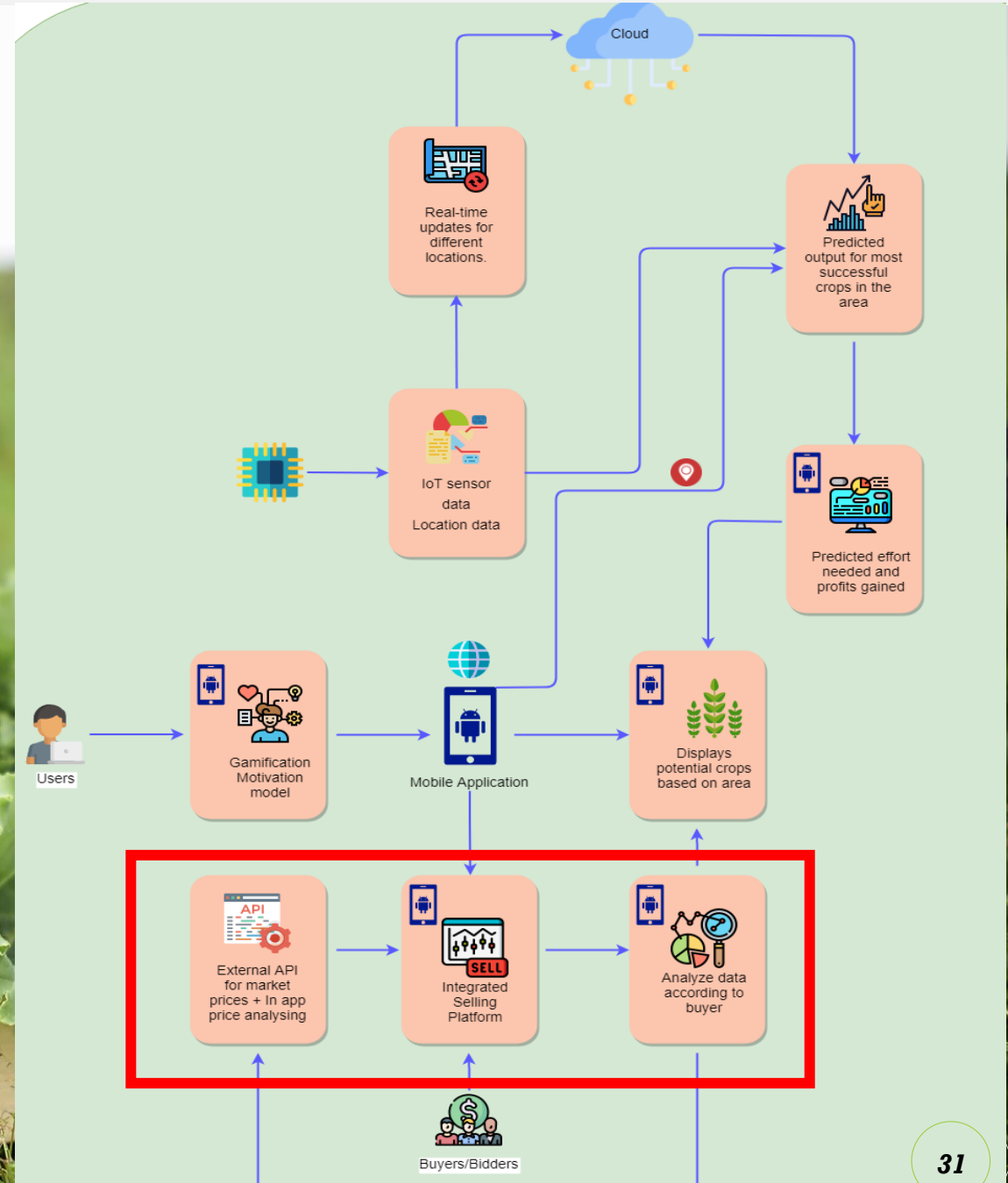
Specialization: Software Engineering





Integrated Selling Platform

- ❖ Integrated Selling Platform
- ❖ Predicting trending crops based on analyzed data



Research Gap

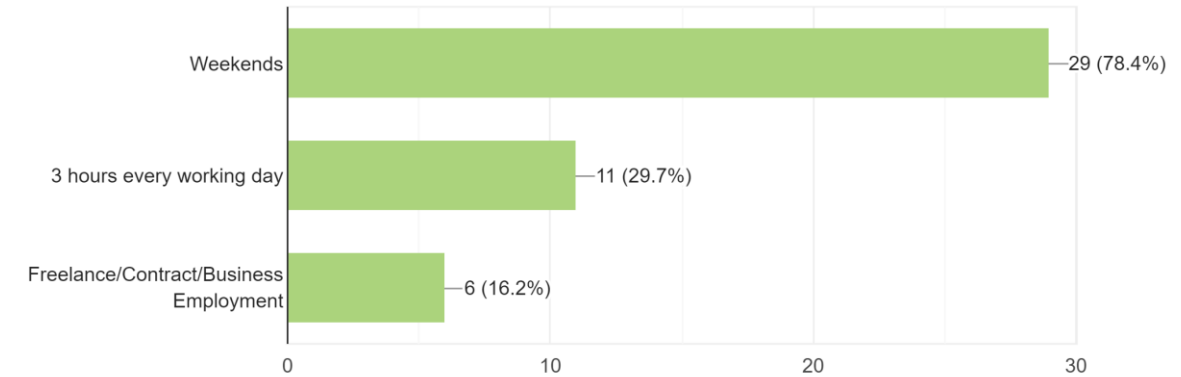
- ❖ Creation of an integrated bidding platform.
- ❖ Creation of a data analysis model that uses machine learning in order to predict future trending crops.

Research Question

- ❖ Is it possible to create a data analysis model that will help predict future trending crops in a given period of time?

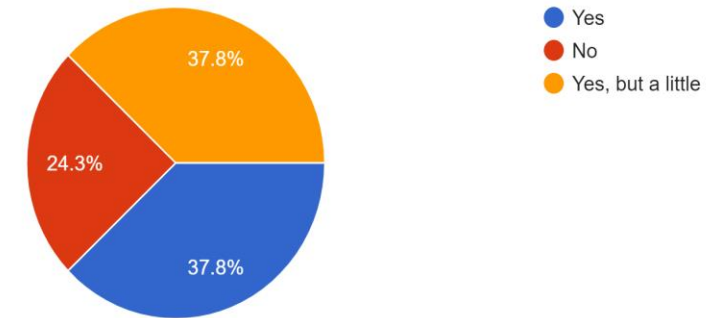
Spare time

37 responses



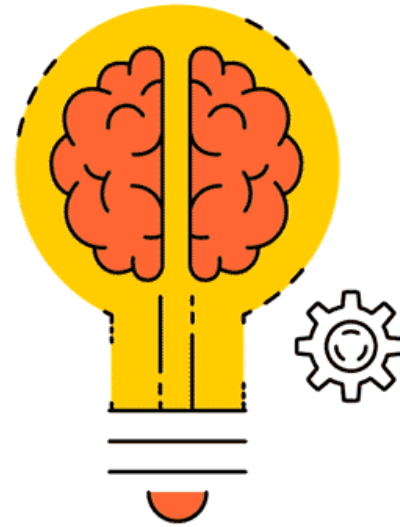
Bare land availability

37 responses



Objectives

- ❖ Create an interactive bidding platform
- ❖ Using Machine Learning algorithms to predict future trending crops.



Sub objectives

- ❖ Designing and developing interactive interfaces for bidding platform.
- ❖ Training machine learning model using a clean dataset.
- ❖ Test the prediction accuracy of machine learning model.
- ❖ Create external API to retrieve prices.



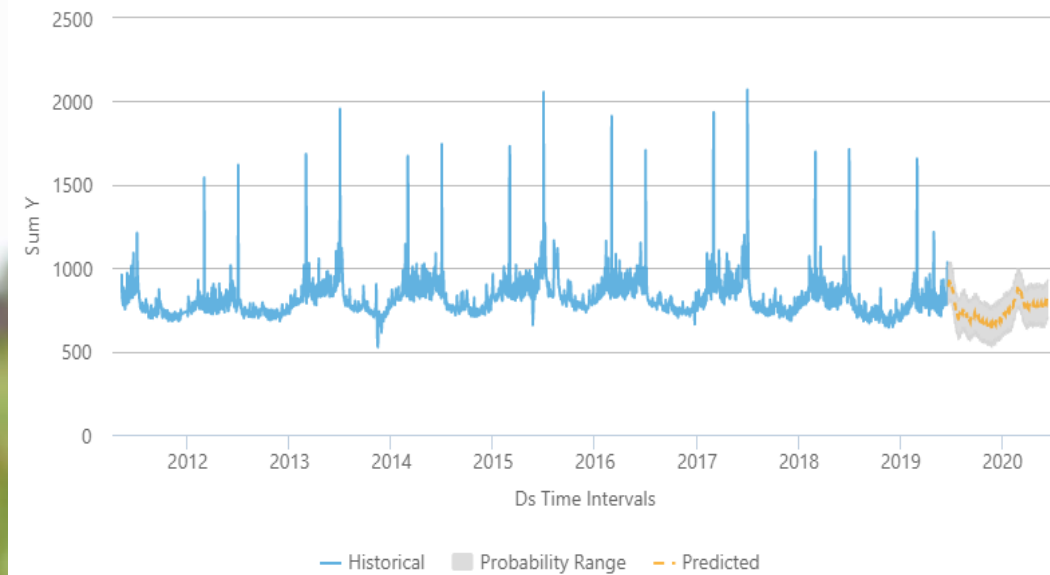
Tools and Technologies

Technologies

- ❖ React Native – Frontend
- ❖ Python Django Framework – Backend
- ❖ Firebase – Database

Tools

- ❖ Visual Studio Code



Algorithms

- ❖ Prophet algorithm (Time Series Model)

Requirements

System Requirements

- ❖ Laptop (Programming device)
- ❖ Internet
- ❖ GPS
- ❖ Smart Android Phone

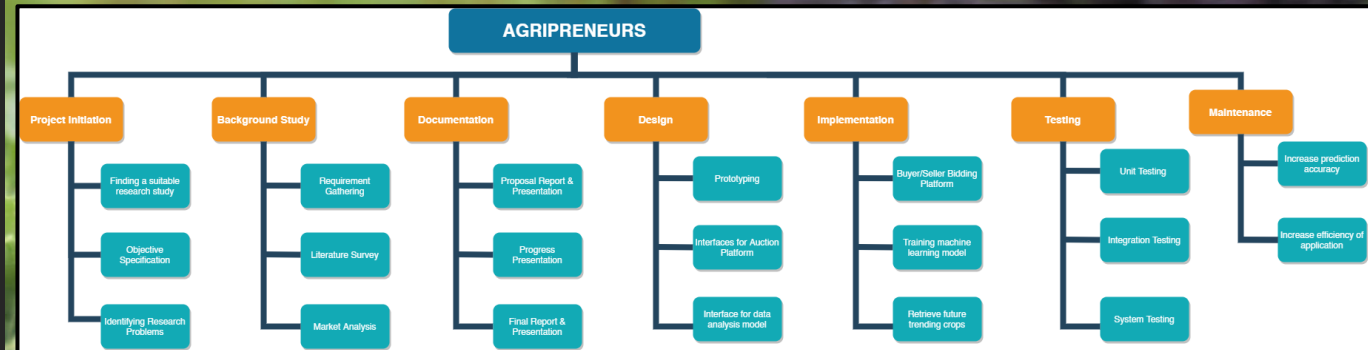


Personal Requirements

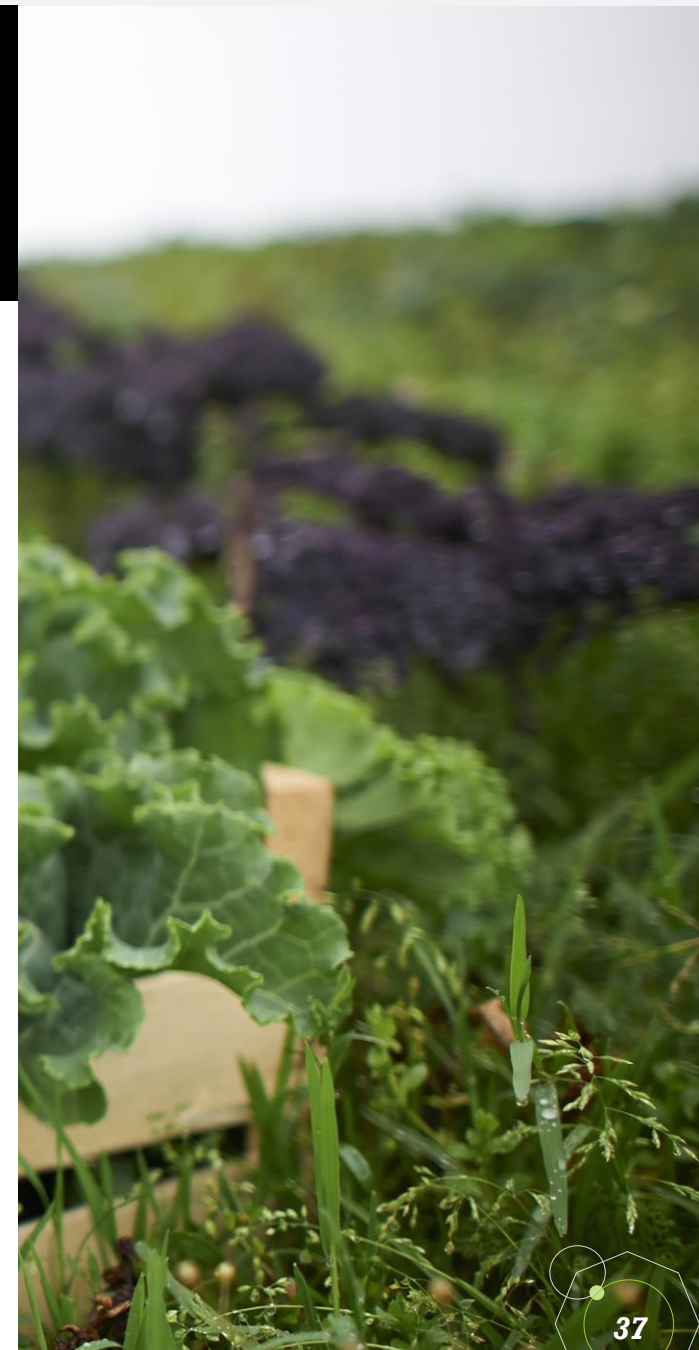
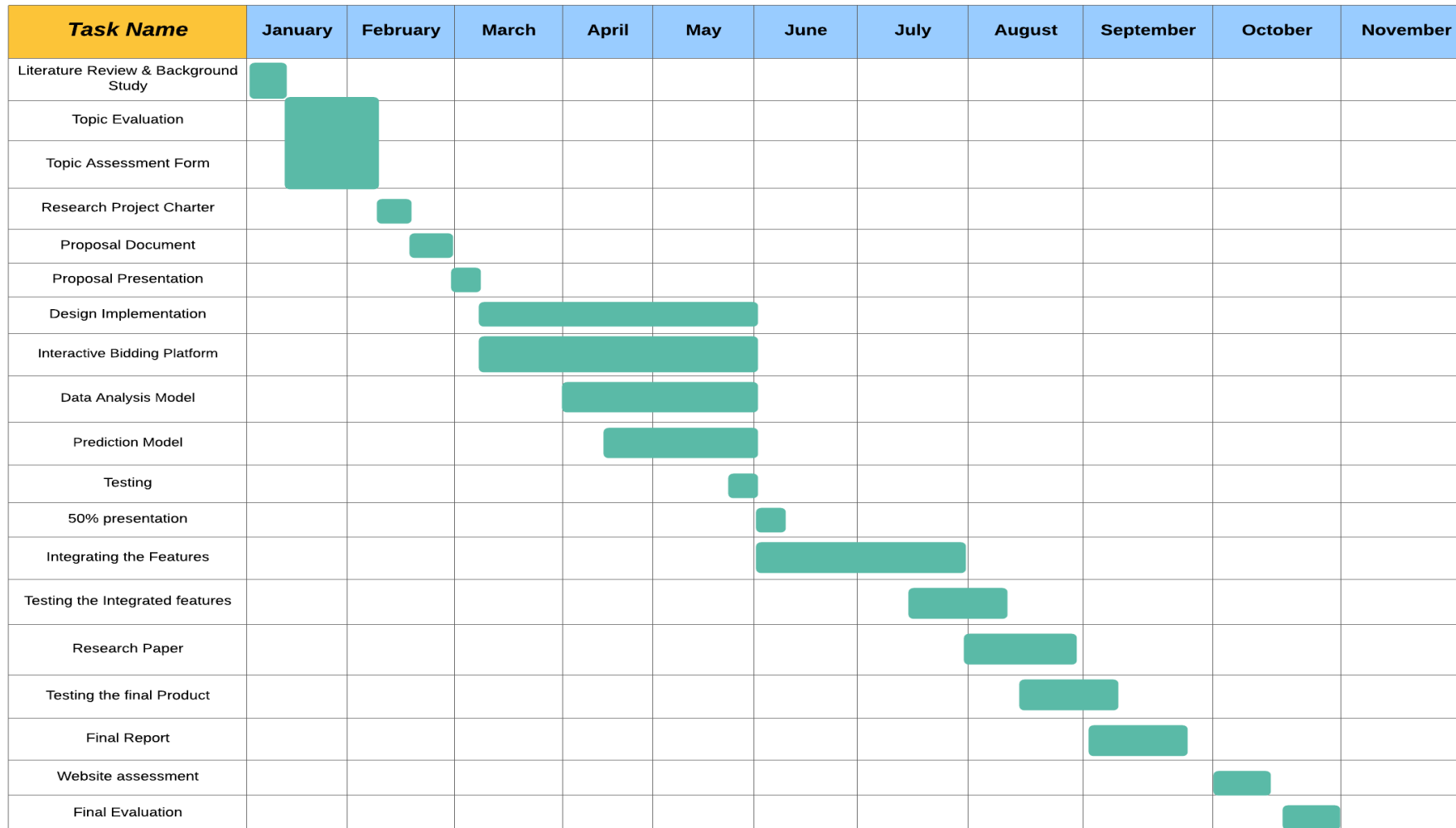
- ❖ React Native, Python , Firebase
- ❖ Clean dataset to train Machine Learning model
- ❖ Train Machine Learning algorithm correctly

Work Breakdown Structure

- ❖ Design and develop interfaces for interactive bidding platform
- ❖ Develop data analysis model.
- ❖ Creating a dataset for machine learning algorithm.
- ❖ Training model and testing better algorithms.
- ❖ Integrate the data analysis model with machine learning model to predict future trending crops.
- ❖ Create an external API to get accurate prices.



Gantt Chart



Existing Application

	FieldCheck App	Descrates Crop App	Agriprenuers
Audience	Farmers	Farmers	Anybody
Yield Forecast	No	Yes	Yes
Success Rate Forecast	No	No	Yes
IoT soil analysis	No	No	Yes
Motivational Model	No	No	Yes
Auction Platform	No	No	Yes

Commercialization

- The application will cut off a 10% service fee from the users, after a certain number of sales.



Introduction

Introduction the availability of the application for users in the Malabe area.



Gathering Users

Gathering end users according to appropriate survey results.



Introducing paid version

After successful analysis, the paid version will be introduced to end users.

- Less Service Fee
- More analytics
- No ads

BUDGET (TENTATIVE)

ITEM	PRICE
Humidity and temperature Sensor Module	LKR.200
Soil moisture sensor module	LKR.150
NodeMcu Lua CH340G ESP8266 WIFI Internet Development Board Module	LKR.730
TOTAL	LKR.1080

Growth Strategy

How will we scale in the future?

Domain: Agriculture

- Fruits
- Dry Food
- Grains

Domain: Handcrafts

- Knitted Accessories
- Cards
- Customized Gifts

Domain: Textiles

- Hand tailored clothing

Summary

- Combination of agriculture , entrepreneurship and technology
- Motivational Gamification Model to make users always involved.
- Machine learning model to predict best crops according to location.
- Machine learning model to predict best crops according to sales in the auction functionality.
- IoT sensors to get data real time according to the location/town.



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- H. R. Rosairo, D. J. J. J. o. A. i. D. Potts, and E. Economies, "A study on entrepreneurial attitudes of upcountry vegetable farmers in Sri Lanka," 2016
- J. Kim and J.-W. Lee, "OpenIoT: An open service framework for the Internet of Things," in *2014 IEEE world forum on internet of things (WF-IoT)*, 2014, pp. 89-93: IEEE.
- C. Akshay *et al.*, "Wireless sensing and control for precision Greenhouse management," in *2012 Sixth International Conference on Sensing Technology (ICST)*, 2012, pp. 52-56: IEEE.



A photograph of a garden scene. In the foreground, there are wooden planters containing green leafy plants, possibly kale. Behind them, there are rows of purple flowers, likely lavender, in a garden bed. The background is slightly blurred, showing more greenery and a bright sky. A dark rectangular overlay is positioned in the center of the image, containing the text "Thank You" and "2021-090".

Thank You

2021-090