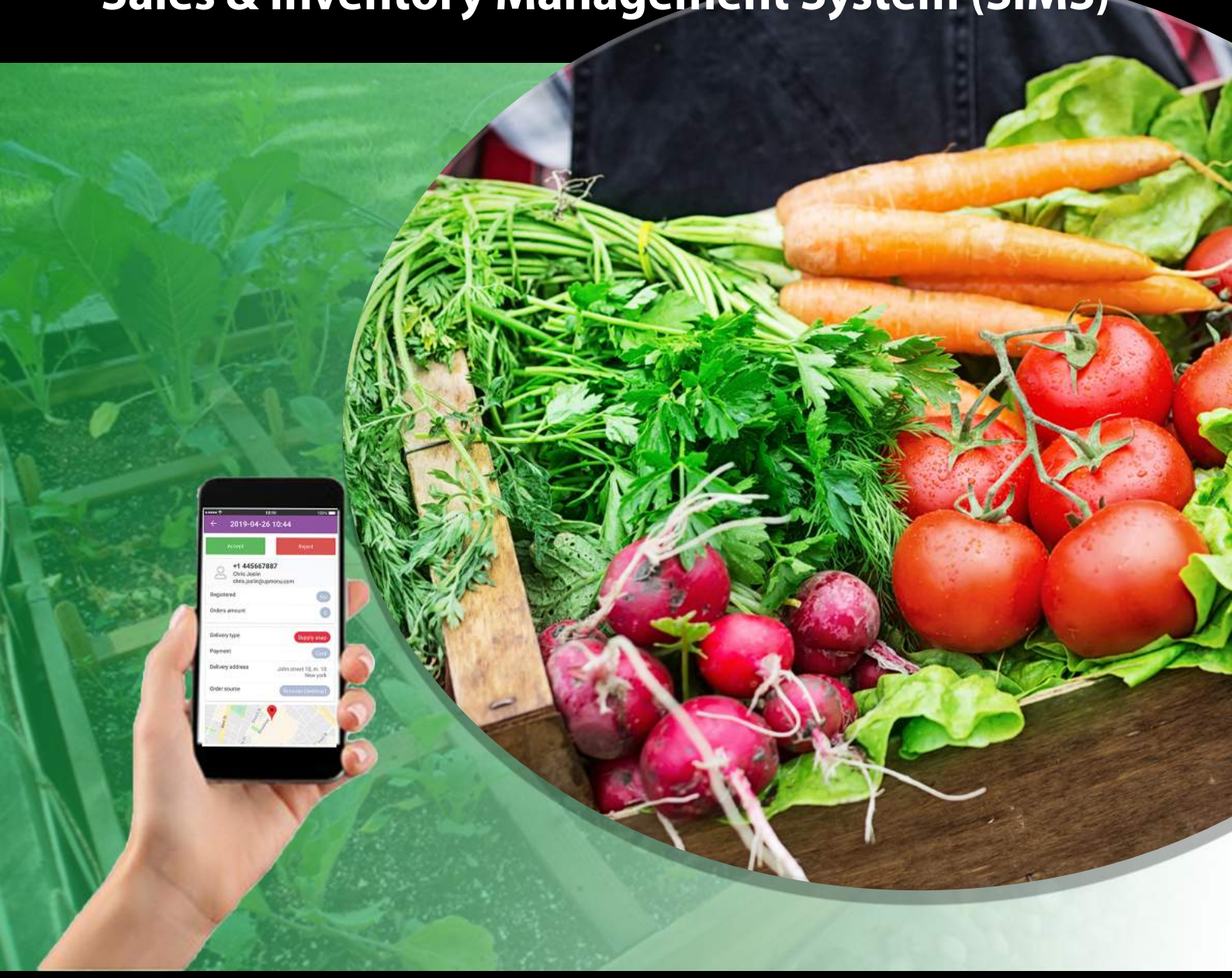
Krish Villa Organic

Sales & Inventory Management System (SIMS)



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ABSTRACT

Agriculture plays an important role in the economy of the country. Organic Agriculture is one of main element of those. Organic Agriculture combines tradition, innovation and science to benefit a good quality of life for all involved. Mr. Krishantha Jayawardena, who owns Krish Villa Organic is visionary person who having a mindset about "***Healthy People, Healthy Living***". Krish Villa Organic is registered as a partnership under the companies Act and further is involved in selling organic vegetables and fruits. The company has their own farms located in Colombo and Lindula. Krish villa also has registered suppliers who themselves are organic farmers mainly in Horana, Bandaragama, NuwaraEliya, Bandarawela, Lindula and also few areas in the Monaragala district.

With the increasing demand for organic vegetables and fruits across the country, Krish Villa is needed a website for their organization to establish credibility in organic food industry. Though company has social networking sites, website will be the center of online presence. Further, buying and selling process is extremely difficult process to manage. Biggest difficulty is to manage the inventory. Currently Krish Villa is facing these problems. Everyone is squeezed for time in the modern world and majority of people are finicky when it comes to visit a store or farm. Therefore, online store and online ordering process is needed for Krish Villa to manage the customers efficiently and stay ahead of the competition.

To conquer the above facts, Krish Villa is needed a web-based application along with a company website. The proposed web application will greatly be simplifying the online ordering process for customer as well as purchasing organic foods and fruits from other farmers. Besides that, this application will cater for managing customer orders who visit the farm and buy foods from Krish Villa. Further, proposed application will be fully feasible for managing the inventory effectively allowing Krish Villa admin to see the real time available inventory. The system will be strictly controlled by the admin but Customers , Farmers and Delivery Person can register themselves and see their relevant information where admin can manage. Apart from the web application, proposed solution will be included a fully responsive web site including an online order portal. Web application access will be routed through the website in order to spread the needed of organic food industry among Krish Villa users , customer, Farmers and Delivery persons.

Proposed system will be developed using latest and matured technologies within the MVC (Model-View-Controller) architecture.

Front End Technologies - HTML , CSS , JS , jQuery Framework, Bootstrap Framework

Back End Technologies - Ajax, PHP, CodeIgniter Framework

Database & Server - MySQL 8.0 & Apache 2.4

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1. CHAPTER : INTRODUCTION

1.1 ABOUT THE CLIENT

Krish Villa is registered as a partnership under the companies act and further is involved in selling organic vegetables and fruits. The company has their own farms in Colombo and Lindula. Krish villa also has registered suppliers who themselves are organic farmers mainly in Horana, Bandaragama, Nuwara Eliya, Bandarawela, Lindula and also few areas in the Monaragala district.

1.2 MOTIVATION OF THE PROJECT

Our motivations of the project are as follows,

1 As BCS Diploma level students, from this project we will have a good experience and support to do our final project in PGD level.

2 Throughout the MISGA mentoring session we learned so many new technologies and many things about the IT field. This is the best opportunity for us to apply that knowledge and get qualified.

3 Because of this system, as developers we and the other citizens will be motivated to organic living. So, we will have a better world.

1.3 OBJECTIVE OF THE PROJECT

OBJ 01 : In the present world, people need smart technologies to make their daily work easier. Through the proposed system, customers can place an order online and pay online or cash on hand and they will get their order to their doorstep safely.

OBJ 02 : Since the organic food market is less, most farmers have to incur losses on their harvest. From the proposed system, farmers anywhere can register online to Krish Villa and sell their best products at a good price.

OBJ 03 : It is really difficult to maintain food inventory from damages as spoiling, cru

shing and insect attractions. Since we are maintaining the inventory batches wise, we can control the above damages and achieve efficiency and productivity in operations.

OBJ 04 : Since throughout our website we are encouraging people to start organic farming even in a mini environment, the people will be attracted and will learn and do farming to save the planet through organic living

1.4 SCOPE OF THE PROJECT

The proposed system will be designed within the below scope,

Buying & Selling Management

Farmer - Farmers will be registered prior to sending vegetables availability. The system will require the name of the farm, main farmer's name, address, area of the farm in perches, list of crops the farm wishes to sell via Krish Villa Organic. As well as upload the picture of the farm and the farmer.
They also can log in to the system using email id and the password once the registration is done

Customers - Customers of Krish Villa Organic must register with the system prior to making a purchase and it will require the customer's name, address, email id and mobile number and the system will allow the customer to upload his/her picture. After the registration customer can log in to the system using email id and the password.

Customer and Farmer Log in Modules - both the customer and the farmer can log in to the system using the login form that will validated using the farmers email id and password

Online & In-Farm or In-Store Order module :

Once the customer logs in to the system, they can visit the store and select the items and add to cart, then the customer can check out and make the payments online using their credit or debit card

Customers can visit to Krish Villa and make purchase and pay for the goods

Discount Module – when customers make a purchase of over LKR 5000 a special 10% discount will be given by Krish Villa Organic

Delivery Person - Orders will be delivered via delivery person and the portal will facilitate registration and log in to delivery persons. System will require the name, driving license number, vehicle type, model and the registration number. Further the driving license and the vehicle book must be uploaded to the system.

Inventory Management

Full Inventory module - View real time available stock & Value, Maintain Selling Price Separately.

Wastage Mange module - Manage Wastage

Dashboards

1 admin dashboard , 1 Farmer Dashboard , 1 Delivery Person Dashboard

2. CHAPTER : ANALYSIS

2.1 INTRODUCTION

Krish Villa is a registered company and currently into buying and selling organic vegetables and fruits. Demand is getting increase day by day and it's difficult to compete with existing competitors with a manual driven business process. Without a proper system, it's difficulty to manage customers , outside farmers and specially inventory which is the key factor of any business. Proposed system will eliminate these drawbacks and helps Krish Villa to maintain their business process efficiently and effectively increasing profit ratio by 10% to 20%. Further, proposed system will help to decreased overhead cost which indirectly increase the profit.

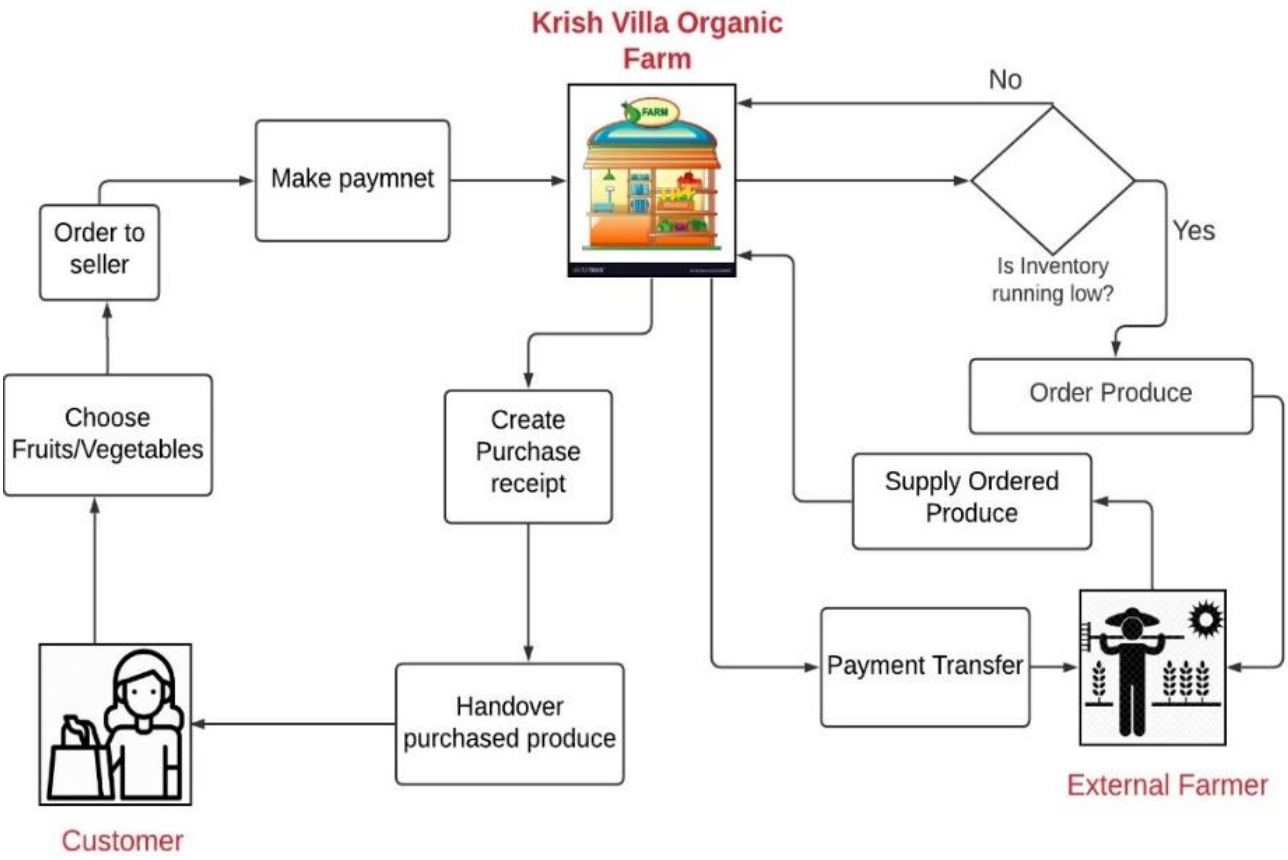
This chapter is written to review the existing business process and described the fact gathering techniques as well as collected functional and non-functional requirements. System analysis is addressed the problem domain for examining the situation with the motive of improving it through suitable procedures and methods. In analysis phase main and very difficult part is requirement gathering. For succeed the difficult part, analyzer has to be studied and understand the current system and the requirement of the problem domain

2.2 CURRENT SYSTEM

Krish Villa Organic is a company registered as a partnership under the company's act involved in selling organic vegetables and fruits, with a vision of "Healthy People, Healthy Living" and a mission of "Promoting Organic and sustainable agriculture, and organic lifestyle to make a healthy community, thus giving an organic and chemical free food for my family".

"Krish Villa Organic" is the brainchild of Mr. Krishantha Jayawardena, the current owner of the company who is in need of a web-based application to cater for the growing demand of organic vegetables and fruits. The company obtains fresh produce from their own farms located in Colombo and Lindula as well as from external suppliers who grow organic produce from areas like Horana, Bandarawela, Lindula paying them every month end.

Customers can visit the company's farms located in Colombo and Lindula to purchase fresh organic produce. If there are any wastage, Krish Villa remove those from current stock to maintain the vision of "Healthy People, Healthy Living". With the proposed system, current business process will be changed with the online ordering and delivering process. Also, the new website will be created and it will help to increase the current customer base.



2.3 DRAWBACK OF EXITING SYSTEM

D01: Inability to cater to a wide customer base-

Contemporarily only the customers in the local vicinity of the Krish Villa farms located in Colombo and Lindula tend to visit the business. The name of the company is only spread by word of mouth. Currently, if a customer wants to make a purchase from a Krish Villa farm they should come travelling all the way to a farm from the luxury of their homes as there are no online payment options available to them. Also, the lack of an interface like a web-based application where you can converse and display products in multiple languages is a disadvantage when trying to expand the market beyond the local customer base very quickly.

D02: Lack of customer information-

In our current system since customers must physically visit Krish Villa farm premises to make purchases there is no way to collect customer information without damaging their shopping experience. Due to the lack of such customer profiles, Krish Villa farms are unable to provide loyalty points or discounts to their frequent customers to encourage them to make more purchases in turn hindering the opportunity of

generating more profits to the farm. This also prevents us from using online marketing tools to target new customers and web analysis tools to gain much more insight into the customer's needs as we don't have sufficient data about the customer's preferences.

D03: Mediocre levels of customer comfort and safety-

With the current situation of the Covid-19 pandemic almost all customers are reluctant to step out and visit the farm premises for purchases fearing for their safety. Waiting in ques and coming into contact with other shoppers increases the risk of triggering a new cluster of patients. Handling notes of money due to the absence of an online payment system only adds to this. Also, in some instances since the customer can't view the available products in advance, he may have travelled all the way to the farm only to find out that the farm may not have the vegetables and fruits the he was looking for. This increases the frustration of the customer and risks his/her future transactions with the company. Customer satisfaction would be less due to such cases.

D04: Inventory Management

When inventory details are determined infrequently as there's no automated system to keep track of goods, there is a potential for errors and missed opportunities, which leads to inventory results with a lack of detail that makes it difficult to spot and minimize factors that contribute to the cost of inventory, such as delivery, purchasing, and handling costs. With a periodical inventory system, it can be difficult to notice inventory shrinkage from theft, rotted and damaged fruits and vegetables. Losses resulting from defective produce being exchanged can go unnoticed. In the food industry timing is everything as the freshness of fruits and vegetables disappear over time. Not having enough stocks of fresh produce at a given time risks infuriating customers over delays and doesn't help with the company's reputation.

D05: Lack of delivery facilities

Since there is no online order module in the current system there is no way to deliver fresh produce to the customers through delivery personnel. This results in requiring customers to visit the farm premises physically spending their valuable time risking their safety through the Covid-19 pandemic. Due to this shortfall the customers may be encouraged to explore other businesses to fulfill their need of fresh produce at the luxury of their homes using an online store.

D06: Lack of Customer engagement

Since there is no website for Krish Villa, there is no proper way of establishing customer trust and confidentially. Even though Krish Villa is into social networking, Also its hard to maintain customer promotion, loyalty programs with the current business process and its not possible to increase the customer retention.

2.4 CURRENT SYSTEM USE CASE DIAGRAM

2.5 SIMILAR SYSTEM COMPARISON

There are similar systems available in the market having similar functionalities like online order management, Inventory management, farmer and customer management.

Example:

Order Management systems where use by Keels, Arpico, Food City. Also, few other online stores. However, due to following reasons, our system is playing minor to medium role in the market.

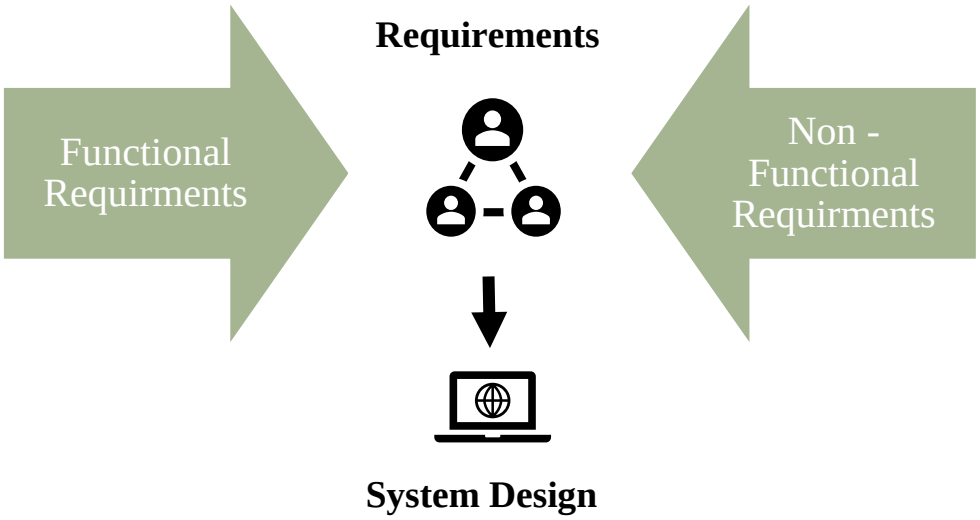
Cost effective price

Features and module expandability in future with low cost

Flexibility for the customizations , 24x7 customer support and Guidance for hardware equipment

2.6 REQUIREMENT GATHERING

Requirement gathering is the difficult part and time-consuming process in analysis stage. There are many methods and approaches can be used for requirement gathering and fact finding. Krish Villa requirement analysis process was followed the most practical and accurate techniques. Requirements were primarily gathered by the business process document and interviewing the owner Mr. Krishantha. The whole point of requirement gathering phase is to identify functional and non-functional requirements.



Techniques used for Requirement gathering

User Observations:

The direct approaches of interviewing and questionnaires provide valuable user feedback based on the questions asked of them; however, there are times when direct observation may be better suited in requirement gathering. To get a better understanding of a user in their in current work environment, the analyst may observe the user themselves

One-on-One Interviews:

One-on-one interviews are the most common technique for gathering requirements, as well as one of the primary sources of requirements. To help get the most out of an interview, they should be well thought out and prepared before sitting with the interviewee.

Inspection of existing documents and reports:

Analyzing existing documents can prove to be a useful technique in requirement gathering, on its own as well using it to supplement other techniques. Reviewing the current process and documentation can help the analyst understand the business, or system, and its current situation

Questionnaires

Questionnaires, allow an analyst to collect information from many people in relatively short amount of time. This is especially helpful when there is dozen to hundreds of respondents whose input will be needed to help establish system requirements. When constructing the questionnaire, general guideline to determine the questions would be to ask "how, where, when, who, what, and why." For how: "How will you use this feature?" "How might we meet this business need?" "How will we know this is complete?" For where: "Where does the process start?" "Where would the user access this feature?"

Example Questioner shared with Krish Villa:

Questionair

Q1 How many customers visit to Krish Villa Per Weekly

☐ 0-3 ☐ 4-7 ☑ 8-15 ☐ More than 15

Q2 What is the most selling Category

☑ Vegitable ☐ Fruits

Q3 Preferd payment method

☐ cash on delivery ☐ Credit /Debit Card

Q4 Feedback for current inventory operation

☐ V.Good ☐ good ☐ medium ☑ need improvements

Q5 What do you prefer to use in Home Page ?:

.....

Q6 Any other comments:

.....

2.7 FUNCTIONAL REQUIREMENT

Functional requirement section elaborates user requirements which were recognized from the analysis phase. For the make clear view of the functions those are described level wise based on the development efforts. That would be easy of understand proposed system functionalities in design phase. The modules are as follows.

FR01. Person Data Management

Krish Villa mainly involves with 3 parties. Customer , Farmer and Delivery Persons. As per the Krish Villa owner, he wants to maintain all person's information including profile pictures. System should be feasible to store name, address, phone no, email and other information. Also system should be feasible to upload farmers location picture and Vehicle registration and Driver license of delivery persons

FR02. Person system access portal

There should be 3 different portals for each person type to login and see their relevant information. Since these are external parties, system should be restricted to display granted page only.

FR03. Inventory Management Module

There should be a section to maintain all master information about items. Further, system should be feasible to buying vegetable and fruits from farmers and maintain the available inventory with value. Vegetable and fruits can be sold online and even by a customer visiting to the farms physically.

FR04. Inventory Wastage

System should keep a provision for wastage since its organic items the chances of being contaminated would be high

(**Our Recommendation**: After discussing with Krish villa, we identified that this can done automatically based on ratio defined in the system. However, it's difficult see the actual due to the current manual process. Therefore, we advised Krish Villa to do the wastage manually in the system for 3 to 4 months and see the trend. After the automation can be done in next phase. Required reports can be given to do the analysis)

FR04. Krish Villa Organic website home page

There should be a separate website for Krish Villa and the home page needs to have separate pages for about us, which needs to have details about the owner and his vision and mission for making Sri Lanka sustainable to organic products. Products pages, which will have the daily items for sale that can be ordered online. Contact us page that will show the location of the main farm in Hokandara, with the contact number of the owner and his email address. Gallery page that will have images and videos about the farms, the cultivations. The home page must also have information about how to make organic living and should be done creatively so that citizens will be further attracted to organic living. The home page must also encourage people to start organic farming even in mini environments like home balcony, indoor gardens…etc.

FR05. Discount Module

when customers make a purchase of over LKR 5000 a special 10% discount will be given by Krish Villa Organic.

2.8 NON-FUNCTIONAL REQUIREMENT

NFR01. Security

System should be feasible to maintain different user levels and access. Proper user authentication and password encryption should be available. Admin should have access to deactivate any person anytime and those people should not be able to access the system again

NFR02. Usability and Performance

System should provide user friendly access and interface to users and interact conveniently.

3. CHAPTER - DESIGN

3.1 INTRODUCTION

System design is the process of defining an architecture, components, modules, interfaces and data for a system to achieve specified requirements. System design is the most important and critical part of whole system development process. Success of most functional and non-functional requirements which were identified on system analysis phase depend on careful and proper system design. Proposed system design is described through flowcharts and several standard diagrams. Technical and Non-Technical persons can get clear idea about the system design using diagrams. The following standard modeling diagrams were used to simplify and modularized the proposed system design very clearly.

- Use Case Diagram
- ER Diagram

3.2 METHODOLOGY

System development methodology is a framework of collection of processes. It is used to structure, plan and control of processes in web application development. Since there are lot of methodologies are available, selecting the right software development methodology for Krish Villa organization depends mainly on our team size, goals, and other factors. Since we have full freedom to select suitable methodology according to our development plan, we have selected "Structured Systems Analysis and Design Methodology(SSADM)" as methodological approach of proposed system development.

01. Agile Software Development Methodology

Agile Methodology is an approach that is used to design a disciplined software management process which also allows some frequent alteration in the development project. It is used to minimize risk by developing software in short time boxes which are called iterations that generally last for one week to one month.

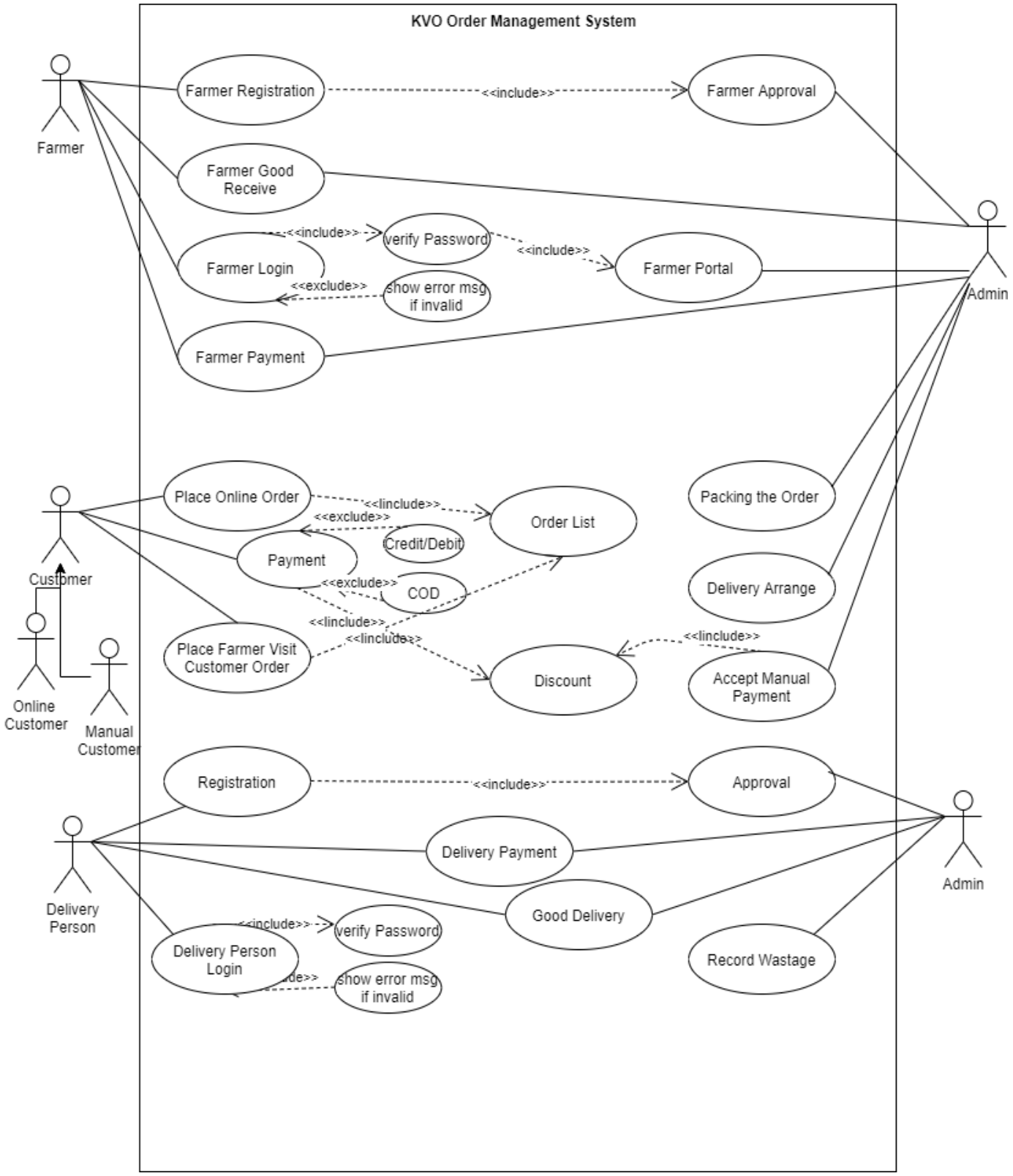
02. Prototype Methodology

The Prototype Methodology is the software development process that allows developers to create only the prototype of the solution to demonstrate its functionality to the clients. Make all the necessary modifications before developing the actual application using this methodology.

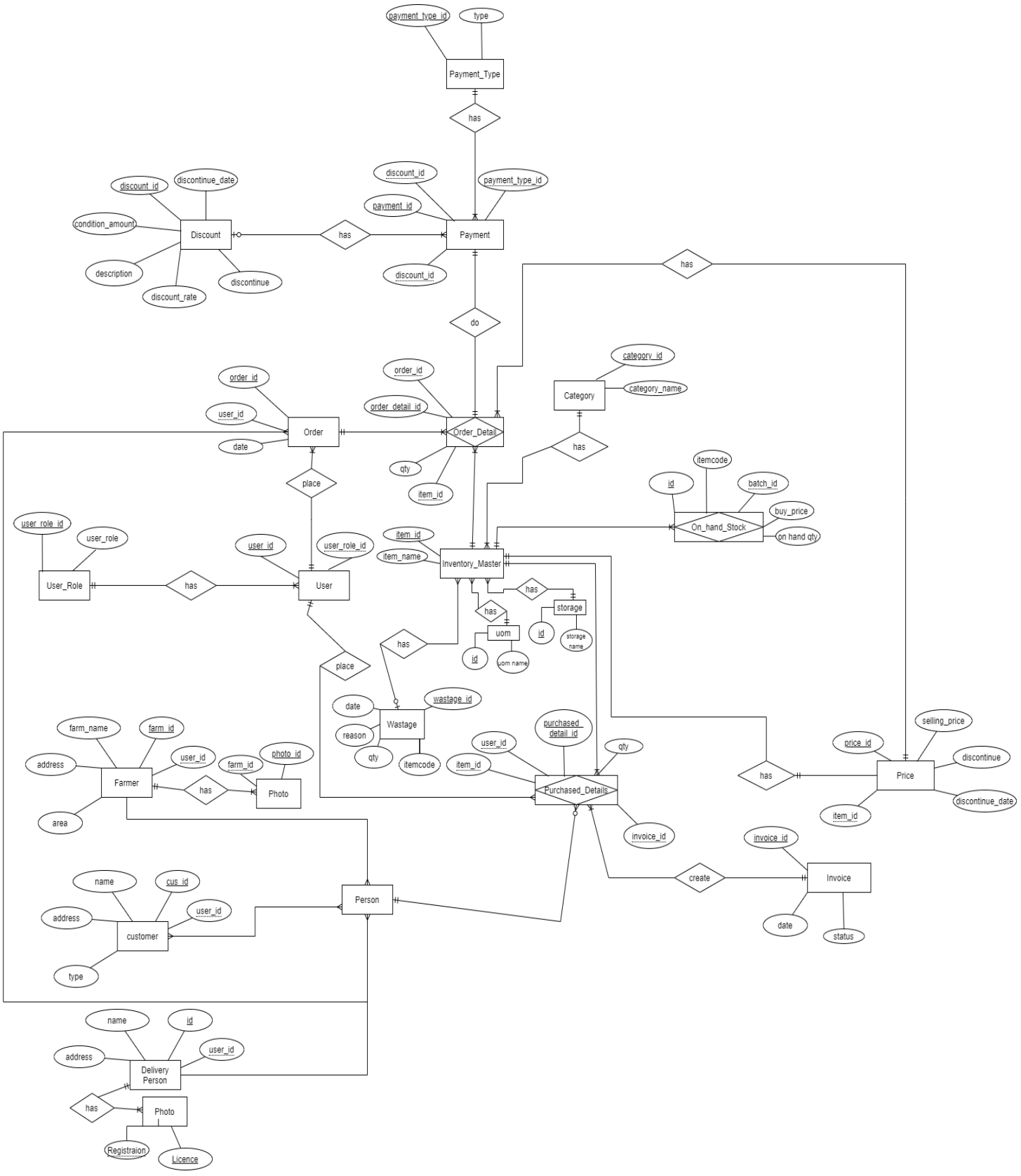
03. SSADM Methodology

SSADM sticks to the traditional waterfall model which allows review of each stage but requires its accomplishment before the next one can begin. In addition to the actual analysis and design stages, SSADM uses tools and techniques that facilitate interface with other stages, such as programming, project management and testing. SSADM is a widely known method because of quality, detailed documentation of the development stages, and reusability for similar projects that follow.

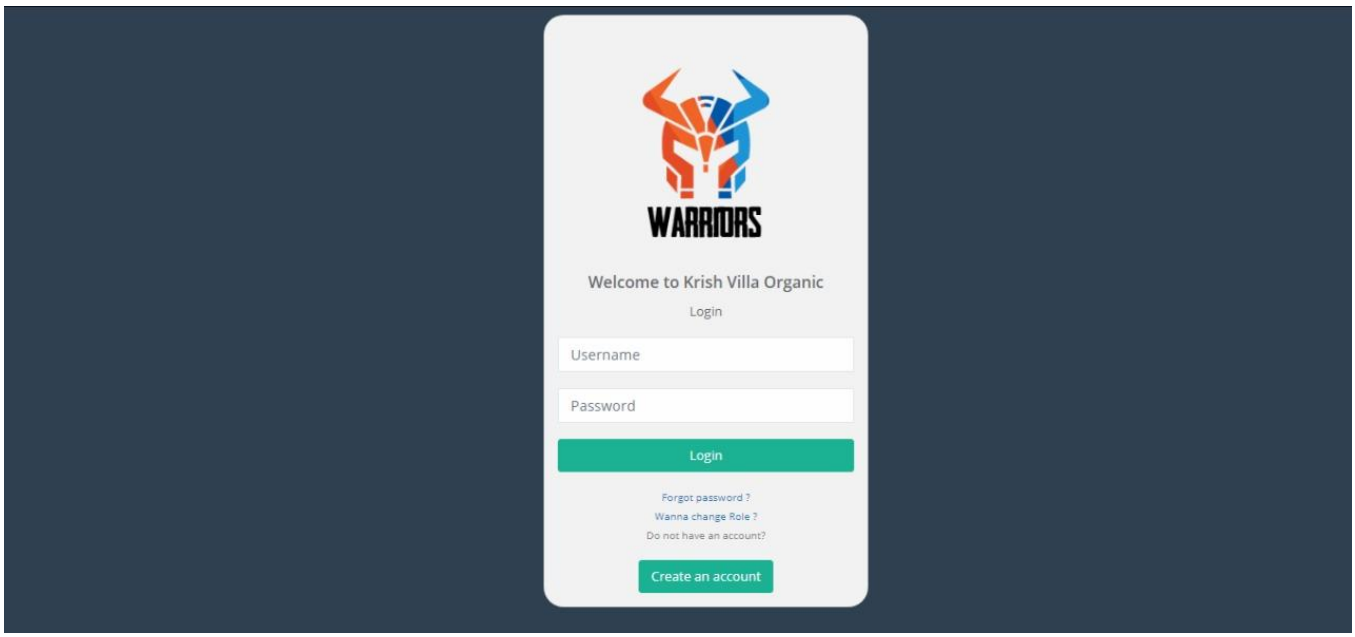
3.3 PROPOSED SYSTEM USE CASE DIAGRAM

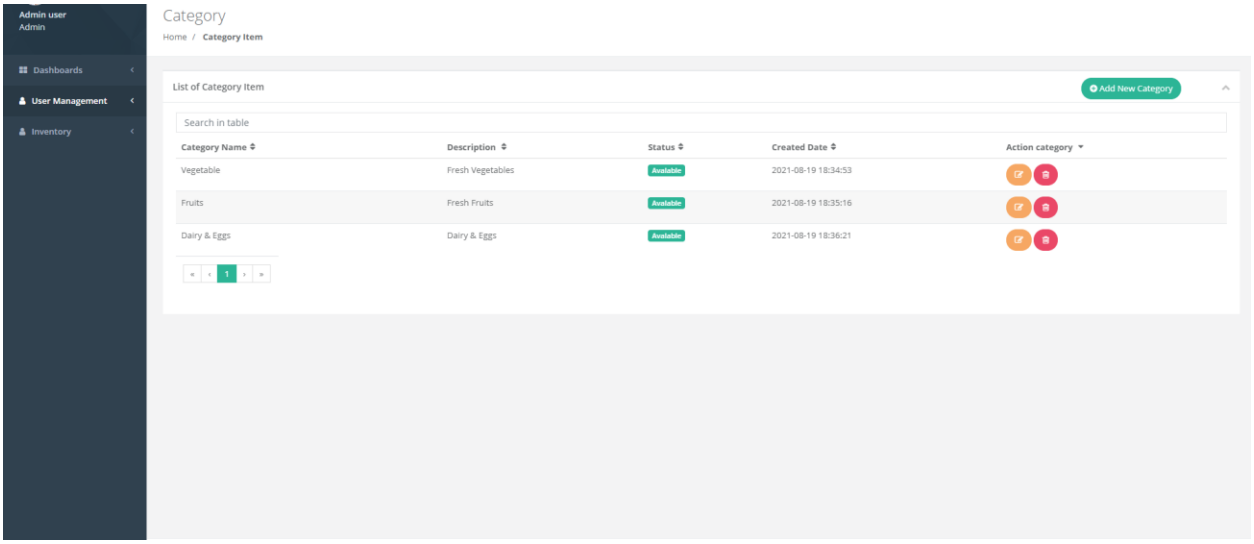


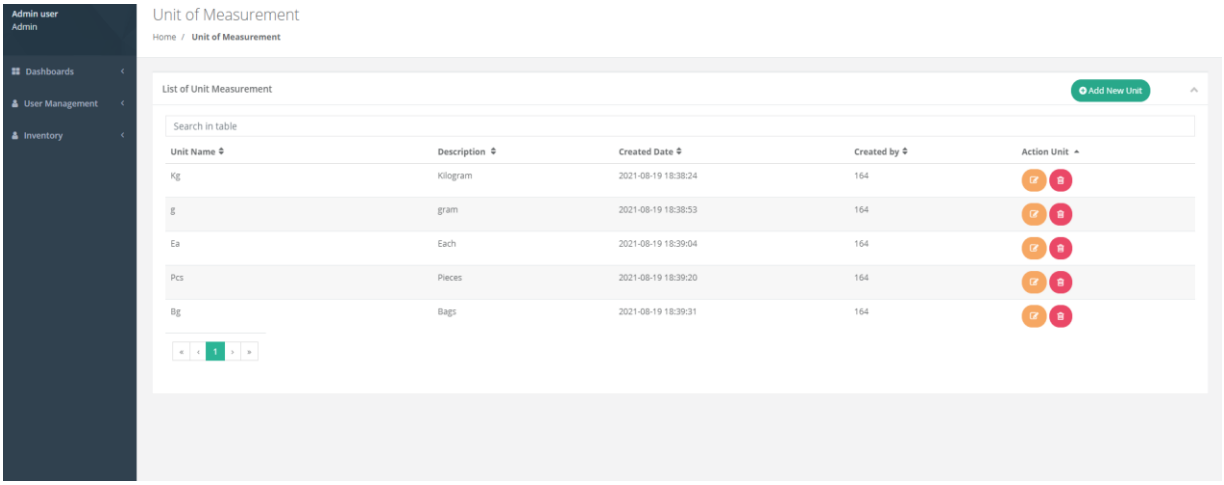
3.4 PROPOSED SYSTEM ER DIAGRAM



3.5 USER INTERFACE



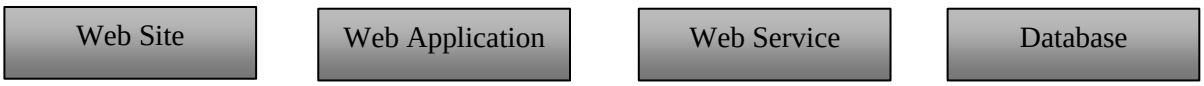




4. CHAPTER : IMPLEMENTATION

4.1 INTRODUCTION

This section will demonstrate what are the implemented functions, technologies we used to develop the application, software and hardware requirement. Total solution has 4 major components.



4.2 IMPLEMENTED FUNCTIONS

As per the requirement gathering, we had with Krish Villa, following modules have been implemented along with a fully responsive web site.

Customer registration Module

Our customer registration module helps Krish Villa to manage and interact with current customer effectively. Whether customer interact through online or visit to farmer, our system is able to keep all the information in single data store.

Farmer Registration Module

Like Customer module, Farmer module also helps Krish Villa to Manage interact with farmers effectively.

This module consists the Farmer registration approval feature also.

Delivery person registration

Deliver Person registration function also added to manage delivery persons effectively.

Customer / Farmer / Delivery Person Login Module

Each person will get access to application to see their transaction information. This will be controlled strictly and only granted pages and information will be visible to respective person.

Inventory Management Module

Our Inventory Management module gives real-time view of inventory allowing Krish Villa to reduce inventory on hand to free up cash while avoiding stockout. Our system allows to keep the cost batch wise to manage the inventory cost-effective. Sub-module is integrated with this handle stock wastage effectively

Discount Module

A discount module has implemented as a sub module in sales order allowing Krish Villa admin to change the discount % based on the current market

4.3 IMPLEMENTATION ENVIRONMENT

The project was constructed using MVC architecture and we used HTML, CSS and JAVASCRIPT to code the web site and php to develop the application. Used Apache server and MySQL as database structure

4.4 TECHNOLOGIES

The new web-based application was developed using the most widely recognized battle-hardened set of technologies within the MVC (Model-View-Control) architecture.

When focusing our attention about the Front-end technologies used for development, Hypertext Markup Language (HTML) and Cascading Style Sheets (CSS) can be highlighted. HTML tells a browser how to display the content of web pages, while CSS styles that content. Bootstrap was used, which is a helpful framework for managing HTML and CSS. JavaScript (JS) was used to make the web pages more interactive. Out of the many JavaScript libraries jQuery was used in this project.

When considering about the Back End technologies used in development AJAX, which is a technique used for creating fast and dynamic web pages was used. AJAX allows web pages to be updated asynchronously by exchanging small amounts of data with the server behind the scenes. PHP was also used in this development phase since PHP is dynamically typed, it meant that we were able to come up with a variety of solutions and workarounds for one problem, and the setup was relatively easy compared to a language like Ruby on Rails. CodeIgniter which is considered as a powerful PHP framework was used since it contained a user-friendly interface, customizability and error handling.

For Database and Server-Side development we used MYSQL 8.0 relational database as our web application needs a place to store its data. Finally, a web application needs a server to handle requests from clients' computers. For that aspect we used Apache 2.4.

4.5 HARDWARE SPECIFICATION

All computer software needs certain hardware components and other software resources to be present on a computer.

Server-Side Requirement	**Cloud Hosting**	**Client Devise requirement**
The following minimum hardware specifications are required for installing the Web Server on a physical or a virtual machine. - 200GB - 300GB Storage - 4 to 8 CPU Core Processor - 16GB to 32 GB RAM	If the webserver and Database servers host in cloud environment, can be recommend following services. • AWS service • Microsoft azure • HostGator	Browsing enabled computer, Laptop and Other Mobile Devises plus other necessary computer accessories

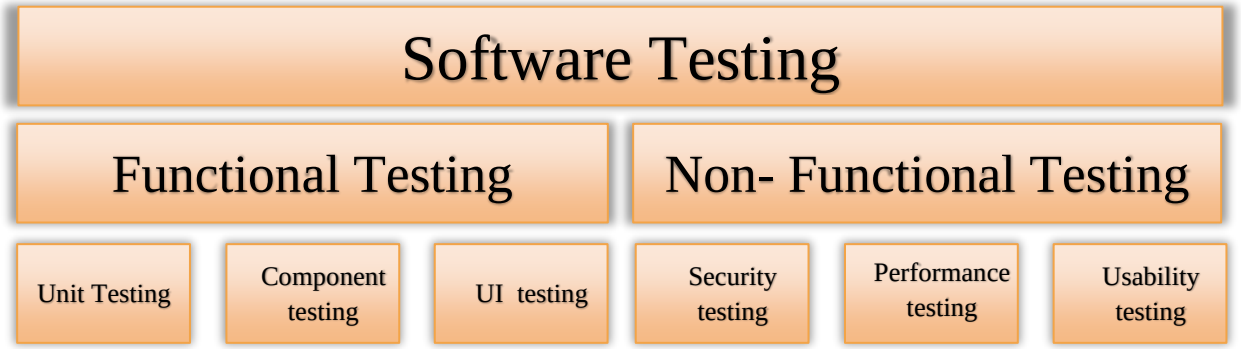
5. CHAPTER : EVALUATION

5.1 INTRODUCTION

Testing is one of the most important process in the software development. Main purpose of testing is to find bugs, errors or any others issues before delivery the system and website to the customer

5.2 TESTING STRATEGY

The whole testing process can be classified as follow,



Functional Testing

Unit Testing - Before testing the entire system, we made sure to test individual parts and check whether those work properly on their own. Our developers make sure they often execute the unit tests throughout the development process

Component testing - Component testing checks individual modules in the system

UI Testing - With UI testing, we check the graphical interface of the software. This includes testing of controls of button, menu, text inputs and ensure feature chosen are optimal for the user experience.

Non - Functional Testing

Security testing - Security testing try to find the system vulnerability and determine how well security is established and internal data are protected.

Performance testing - Performance testing verify website and application well performs

Usability testing - Usability testing validate how human-friendly is the system.

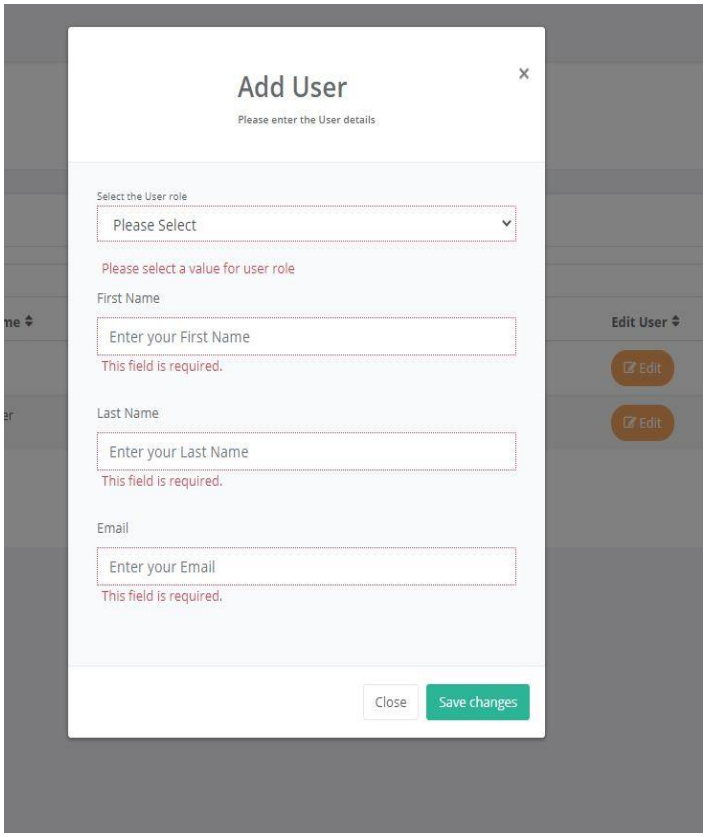
Above testing types is done by using following testing methods,

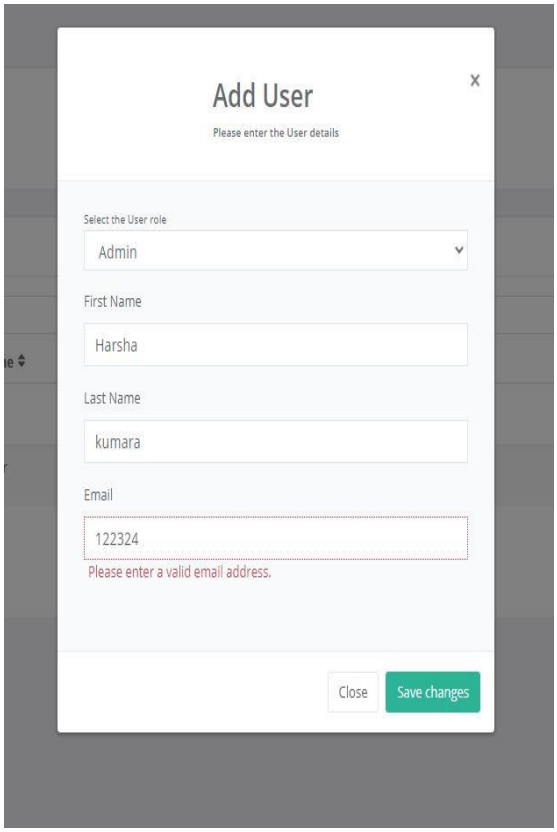
White Box Testing - Internal Structure is being known to tester who is going to test the software. Generally, this is performed by developers and programing knowledge is required.

Black Box Testing - This is used to test software without knowing the internal structure of code or system. Typically, this is performed by QA and programing knowledge is not required to carry out this task

5.3 TEST CASES

Scenario 1	Log in to the system as a customer				
Test case	**Test steps**	**Test data**	**Expected result**	**Actual result**	**Test status**
Invalid email and correct password	1. Navigate to home page 2. Enter email id 3. Enter password	Email id - abc@gmal.com Password - abc123	Message : Invalid username or password	As expected,	Pass
Valid email and incorrect password	1. Navigate to home page 2. Enter email id 3. Enter password	Email id - abc@gmail.com Password - aBc123	Message : Invalid username or password	As expected,	Pass
Invalid email and incorrect password	1. Navigate to home page 2. Enter email id 3. Enter password	Email id - abc@gmal.com Password - aBc123	Message : Invalid username or password	As expected,	Pass
Valid email and correct password	1. Navigate to home page 2. Enter email id 3. Enter password	Email id - abc@gmail.com Password - abc123	Should navigate to the customer profile.	As expected,	Pass





6. CHAPTER : CONCLUSION

Developing a professional level software in two weeks is a big challenge. Lots of logical and theoretical concepts and techniques applies when develop that kind of system. Sometimes it could be a critical situation if someone leave middle of the project. But with the good team collaboration we were able to complete more than half of the specification.

This system will give answers to faults in manual process .therefor we expect the aim of the develop of the software has fulfill successfully

Lessons learnt

Gained a valuable exposure to create a real-world project.

Learned to manage time and works in a tough schedule.

Improved Project management, Analytical, Problem-solving, Team-Work, Communication and more skills.

Exposure to user interface and user experience.

Drawing ER diagram, Sequence diagram and Process mapping.

Collaborating with team members and using GIT.