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Chapter 1
INTRODUCTION

1.1 Introduction

The ‘AgroPal’ is a project carefully designed as an online agriculture platform that helps farmers, sellers, and buyers to interact with each other and get the products which they want to buy and sell. The meaning of ‘AgroPal’ is the combination of two words where ‘Agro’ stands for agriculture and ‘Pal’ is a Nepali word i.e. roof where AgroPal combine means all agricultural products under the same roof. This project is designed to help the farmers to get their needy things at a reliable price and people who want to buy/sell fresh, organic, quality products as well. This platform is highly in demand because of the situation humans are facing these days.

In addition, the main motive of this project is not to give the profit to any other second sellers. The one who works hard (i.e. farmers) should be paid not others. Nowadays, there are many secondary dealers which consume half of the actual price product as profit which is unreliable to producers and consumers. AgroPal acts like a bridge to connect directly agriculturalists and buyers to reduce price which is profitable for secondary dealers. Moreover, it also deals with tools and equipment needed to farm at a lower price than others.

1.2 Problem Statement

In the current context, People are more focused on living a healthy life and are searching for a digital platform that makes their life easier. Many are trying to protect themselves from crowded areas and willing to save their time and energy, they want to buy everything by sitting at one place and get what they want at their doorsteps. Nowadays people are not able to get organic food although there exist many local farmers who provide organic food,

all they need is proper marketing. In Nepal the local farmers are not getting enough fare due to lack of proper marketing. “AgroPal” is the project that focused on these problems, as it promotes on dealing with healthy fruits and vegetables. Besides this, it also supplies agricultural tools such as (Sickle, Hoe, Spade, etc.). As digital marketing is growing rapidly, it has become essential to develop platforms like AgroPal.

1.3 Objectives

The objective of this system can be summarized as:

- To provide organic products.
- To provide digital community for local marketing.
- To develop direct relation between sellers and buyers.
- To provide easy access of agricultural equipment and products

1.4 Scope and Limitation

1.4.1 Scope

- It contributes to promote local marketing of agriculture related field.

1.4.2 Limitation

- It doesn’t have access to digital payment.

1.5 Report of Organization

The material presented in the project is organized into five chapters:

- Chapter 1 of project includes introduction which sketch problems, objectives and limitations.
- Chapter 2 describes the fundamental theories and concepts as well as information about existing system, journals and references.

- Chapter 3 is the summarizes of system analysis and design where description of use case diagram, performance & reliability, different feasibility analysis, diagrams, database as well as architectural design are set out.
- Chapter 4 will provide an account on implementation and testing, tools used for preparation of the project. Test cases for unit testing as well as integration testing are done. Implementation details of modules will be trace.
- And the chapter 5 will be the brief summaries of outcome of the project, conclusion, reviews as well as future recommendations, improvements that can be done on upcoming days and feedback systems, stability of the project.

Chapter 2

BACKGROUND STUDY AND LITERATURE REVIEW

2.1 Background Study

For this project an online agricultural platform was choosen. Online shopping platform where people can get many organic products as well as agriculture tools and equipment. In the previous year 2020, as most of the people were quarantine so they begin to prefer online platform rather than visiting every day store so by viewing the situation here is 'AgroPal'. The Php framework Laravel is used for development of web application. The concept of this web app is to inbuilt local marketing so that there is no waste of degradable products and helps to reduce imports of it from foreign countries.

2.2 Literature Review

The research and reviews for the project are some of the related websites of our country. A reference to an existing system like AgroMart Nepal [1] and AgriNepal kausi kheti [2] was taken both websites are currently being used for organic products and for agricultural tools respectively but our AgroPal is a collaboration of both features. AgroMart is in practice to sell organic products and herbs/shrubs to cultivate whereas AgriNepal is providing compost fertilizers, seeds, and agricultural tools. AgroPal is develop to sell fresh vegetables, fruits. Besides this, it has also focuses on providing agricultural tools, compost fertilizer, seeds, organic products, etc.

Form the journal 'What do customers thinks about farm animal welfare and model organization?' published in Nov 15 2016. The consumer paper identifies five clusters and, thus, strategic groups for the purchase of animal welfare products within the large group of consumers that differ significantly in their attitudes towards modern agriculture, their perception of animal welfare, their social acceptance of meat consumption and their shopping behaviour. Even personal differences are found between the clusters. Based on

the results, we derived specific marketing implications for each cluster. These implications can help to develop a more differentiated market segment for animal welfare products in terms of animal welfare level and required price premium, enabling consumers to make product choices according to their preferences [3].

AgroManang it sells the organic apple products which is directly imported from manang which is also popular for resting point for climbers and apple [4].

In agrinepal, it is a great web page which provides farmers with necessary tools and seeds but does not provide farmers the necessary platform and exposer to sell their products. Whereas, agro mart Nepal provides necessary platform for farmers to sell their products but does not provide the necessary tools. So, to counter the above limitations this project was made.

Chapter 3

System Analysis and Design

3.1 System Analysis

System analysis is a process of gathering and interpreting facts, diagnosing problems and the information about AgroPal. It is done to recommend improvements on the system. It is a problem-solving activity that requires intensive communication between the system users and system developers. It is an important phase of any system development process. The system is studied to the minutest detail and analyzed. The system analyst plays the role of the interrogator and dwells deep into the working of the present system. The system is viewed as a whole and the input to the system is identified. The outputs from the organizations are traced to the various processes. System analysis is concerned with becoming aware of the problem, identifying the relevant and decisional variables, analyzing and synthesizing the various factors and determining an optimal or at least a satisfactory solution or program of action. A detailed study of the process must be made by various techniques like interviews, questionnaires etc. The data collected by these sources must be scrutinized to arrive to a conclusion. The conclusion is an understanding of how the system functions. This system is called the existing system. Now the existing system is subjected to close study and problem areas are identified.

3.1.1 Requirement Analysis

I. Functional Requirement

- Register: Enter or record on the site for the first time, once registered user needs only username & password.
- Login: Logging in is the process by which an individual gains access to a web application by identifying and authenticating themselves.
- Add, update and delete: Feature of adding product photos, description, price of the product & the quantity available.
- Contact: The buyer can directly contact us through contact page by writing message.

- Add to cart: The buyer can add a product to cart and purchase a product in large quantity.
- User management: Admin can check the user profile and manages the user.
- Search: Anyone entering the web app can search the product and decide to purchase.

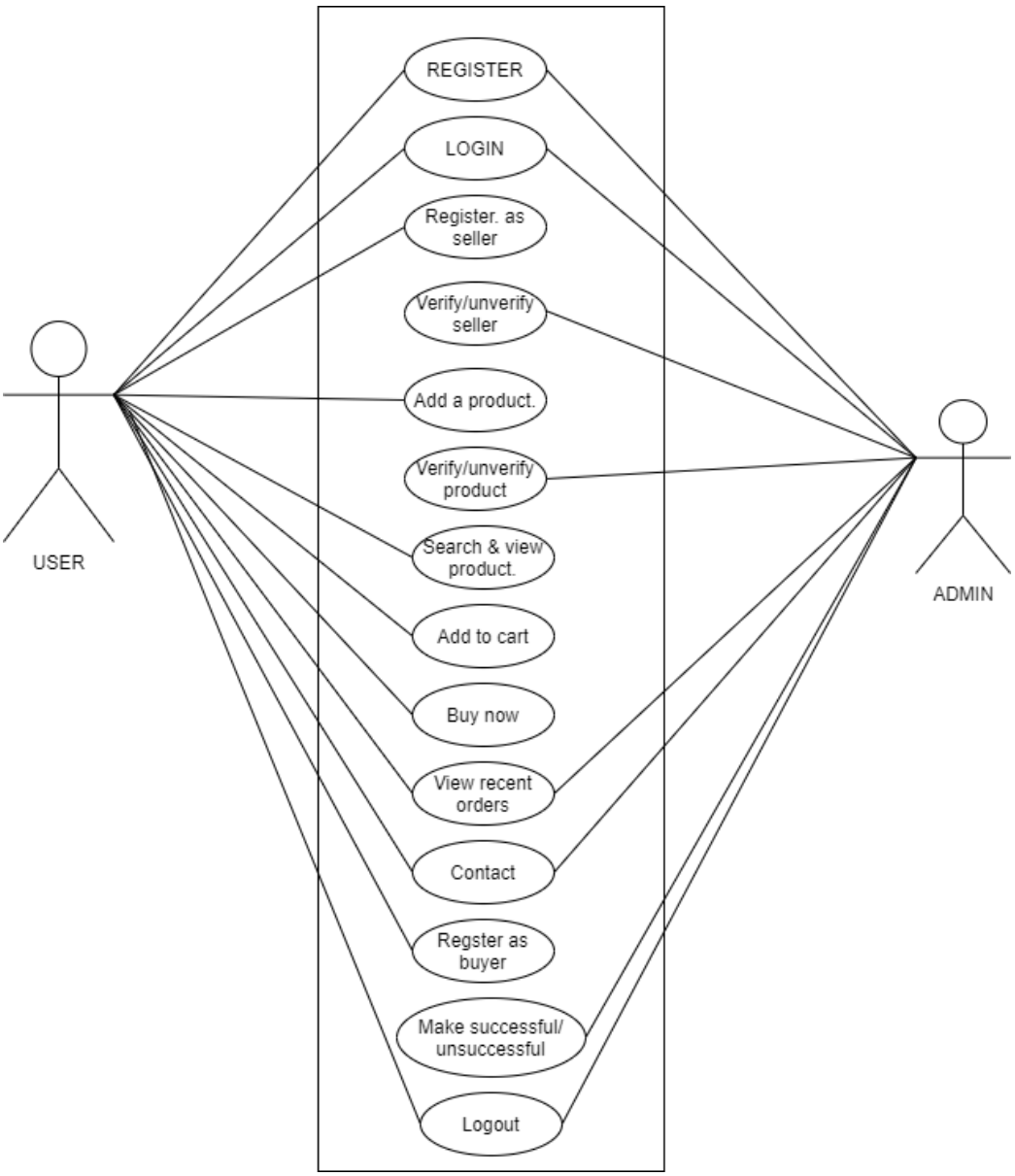

Figure 1: Use case diagram of user/admin

II. Non-Functional Requirement

- Usability: Efficiency to use because many task users can complete without any help. Simple to understand the interface.

- Security: The admin can only view the number of users and the details of seller.

3.1.2 Feasibility Analysis

After doing the project 'AgroPal' study and analyze all the existing or required functionalities of the system, the next task is to do the feasibility study for the project. All projects are feasible if given unlimited resources and infinite time.

I. Technical feasibility

The website will be technically feasible in terms of many factors. It will be within the limit of current technology. The system requirement for this system is not so much. The system will be developed using existing development tools and technologies.

II. Economic feasibility

It is economically feasible because it will be developed using open-source tools. No any paid version of software and professional developers are used to build the project. No any other hardware resources will be required except PC.

3.1.3 Data Modelling

A data model is a mechanism that provides this abstraction for database application. Data modeling is used for representing entities and their relationship in the database E-R (Entity Relationship) Model can be referred as a Data Model E-R Model is a popular high-level conceptual data model. This model and its variations are frequently used for the conceptual design of database application and many database design tools employ its concept.

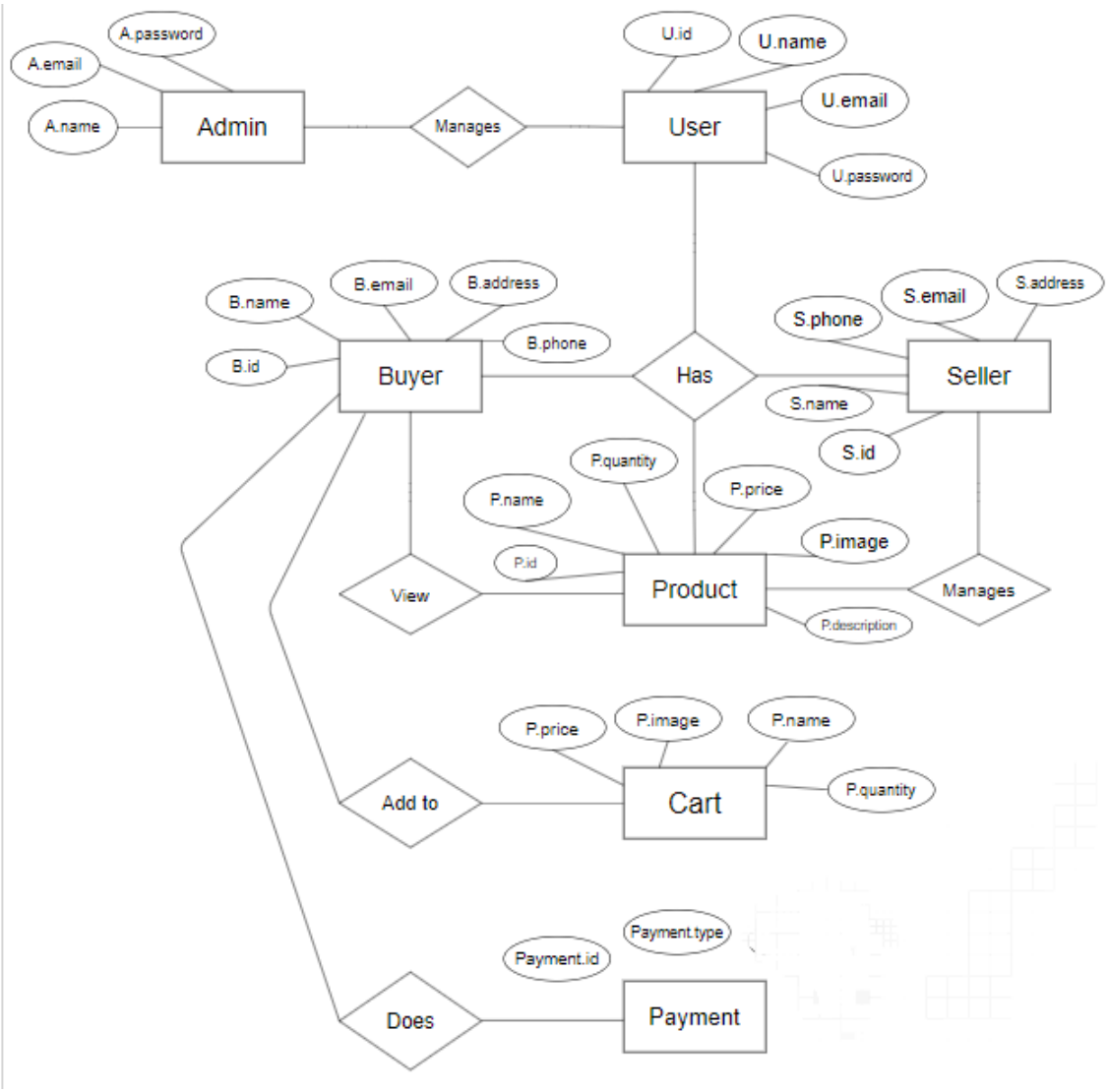

Figure 2: ER Diagram of AgroPal

Agro Pal entities and their attributes:

- Users Entity: Attributes of Users are user_id, user_name. user_mobile. user_email, user_usemame, user_password.
- Admin Entity: Attributes of Admin are admin_id, admin_email, admin_password.
- Products Entity: Attributes of Products are product_id. product_name. product_description, product_price, product_image.

This ER (Entity Relationship) Diagram represents the model of online platform Entity. The entity-relationship diagram shows all the visual instrument of database tables and the

relations between users (buyer, seller), admin and products. It used structure data and to define the relationships between structured data groups functionalities. The main entities are Users, Admin, and Products.

3.1.4 Process Modelling

A DFD can be referred to as a Process Model. A data-flow diagram (DFD) is a graphical representation of the "flow" of data through an information system. DFDs can also be used for the visualization of data processes (structured design).

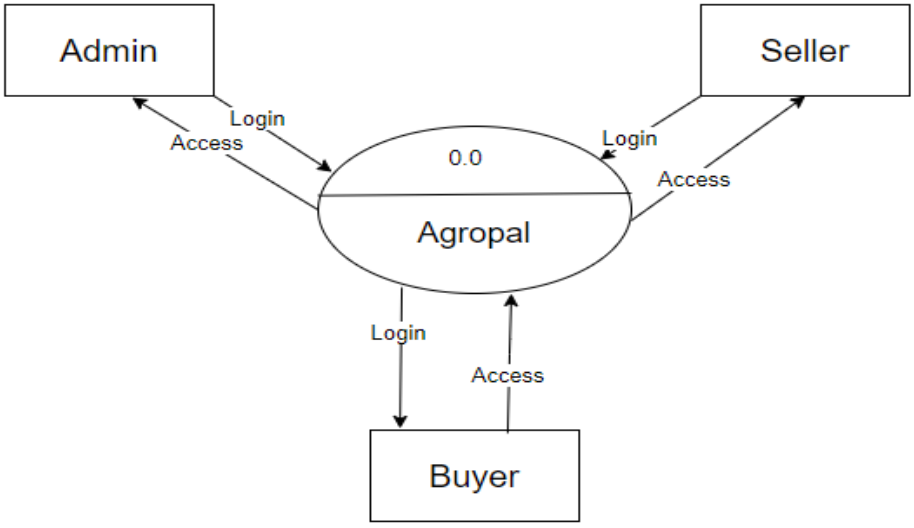

Figure 3: Level 0 DFD of AgroPal

DFD Level 0 of Agropal contains basic relationship of users (Buyer, Seller) and admin.

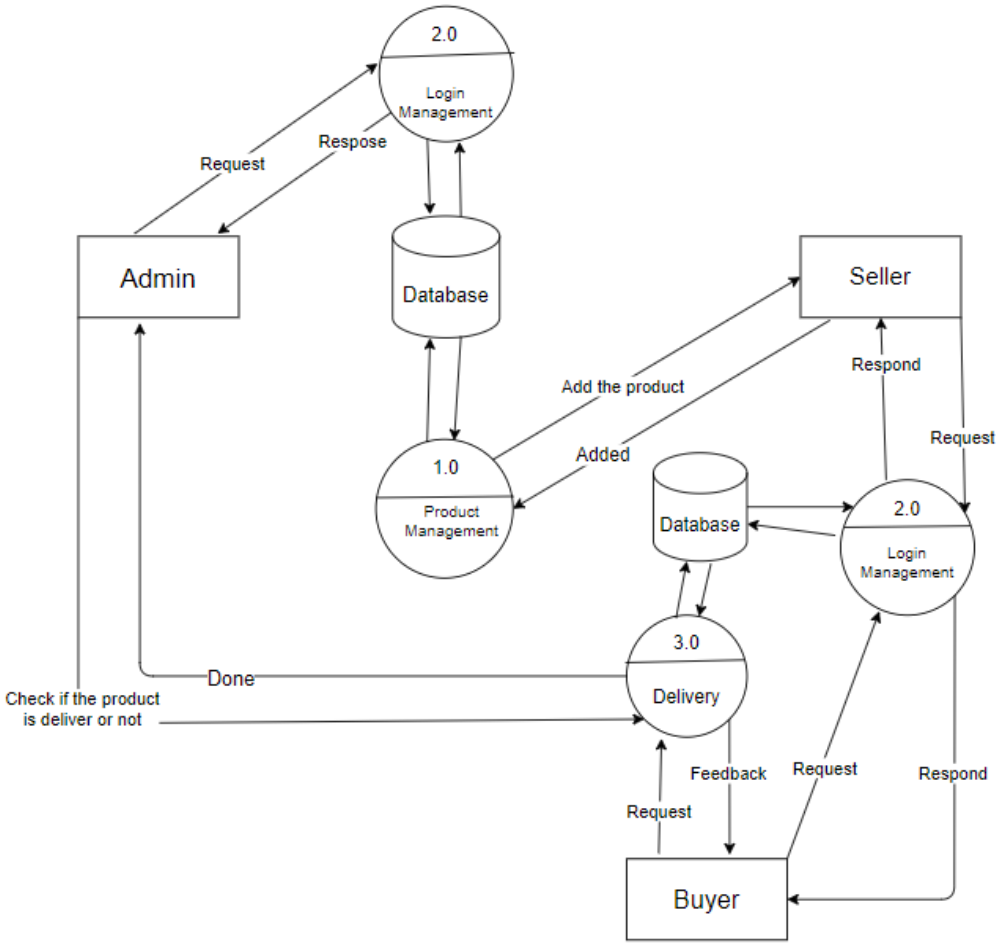

Figure 4: Level 1 DFD of AgroPal

DFD Level 1 then goes one step deeper into parts of Level 0 of Agropal. It may require more functionalities of the project to reach the necessary level of detail about the Agropal. It is designed to be an at-a-glance view of the products and showing the system as a single high-level process, with its relationship to external entities of users and their posts.

3.2 System Design

3.2.1 Architectural Design

This is a Three-tier architecture which consists of a presentation tier, a application tier and a data tier.

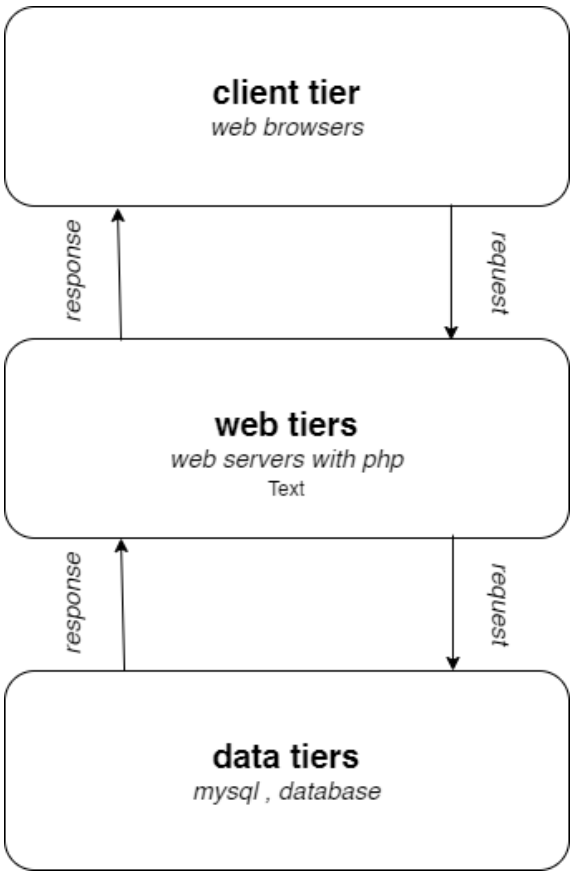

Figure 5: Architectural Design

I. Client Tire

It is also called as Presentation layer which contains user interface part of the system. This tier is used for design purpose where data is presented to the user or input is taken from the user. This top-level tier can run on a web browser, as desktop application, or a graphical user interface (GUI). Web presentation tiers are usually developed using HTML, CSS and JavaScript.

II. Web Tire

The Web tier also known as the application tier or middle tier acts as an interface between Client tier and Data tier. This tier is also called the intermediary layer which helps to make communication faster between Client and Data layer. The application tier can also add, delete, or modify data in the data tier.

III. Data Tire

This is a data access tier which contains methods to connect with database and to perform insert, update, delete, get data from database based on our input data. This is the tier where the information processed by the system is stored and managed.

3.2.2 Database Schema Design

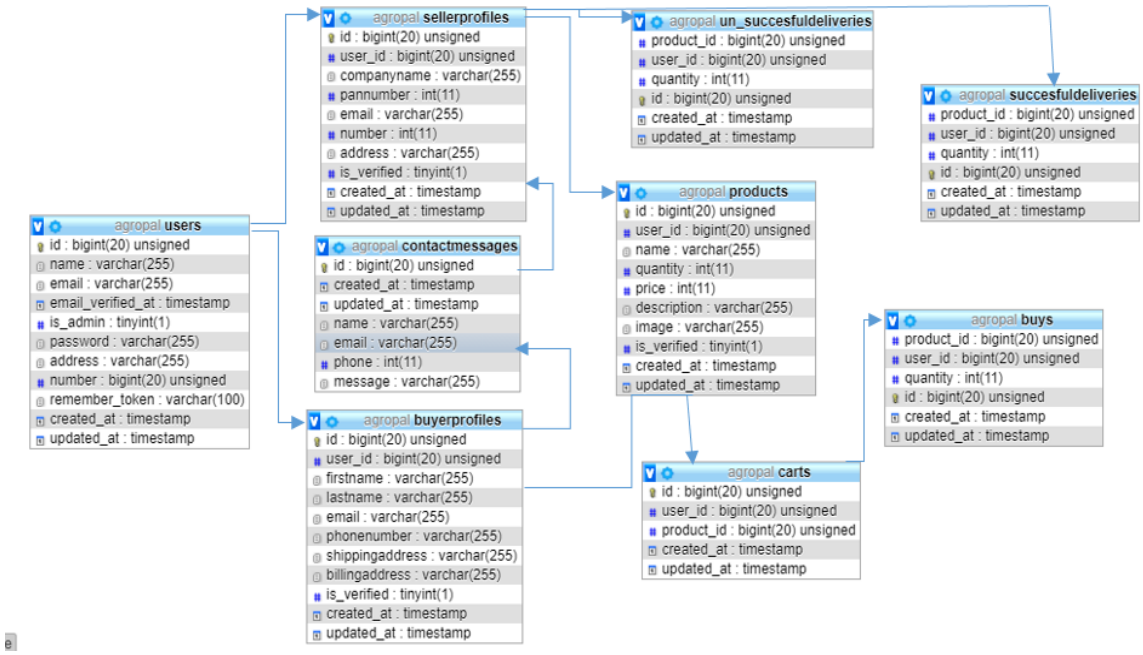

Figure 6: Database Schema Design

3.3.3 Interface Design

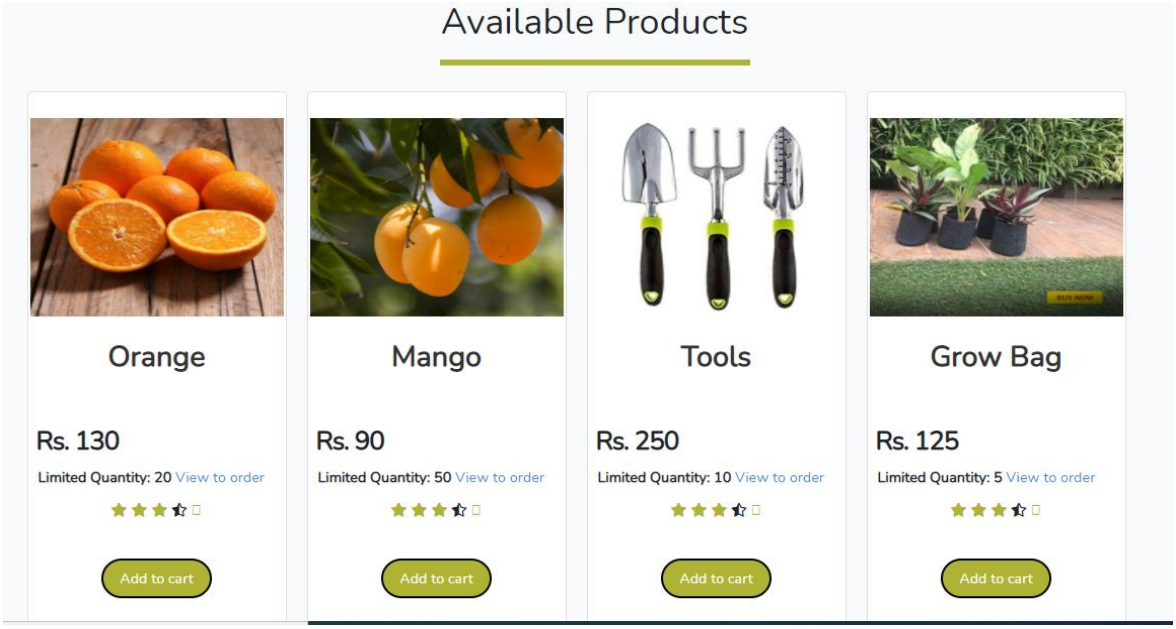

Figure 7: User Interface 1 of AgroPal

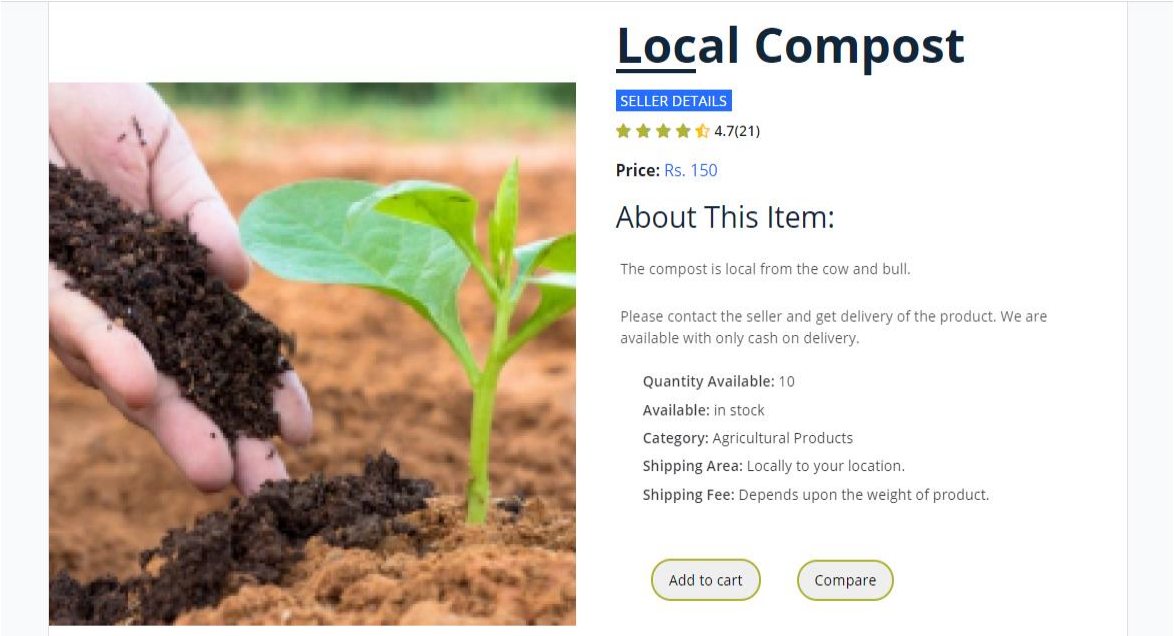

Figure 8: User Interface 2 of AgroPal

Chapter 4

IMPLEMENTATION AND TESTING

4.1 Implementations

A waterfall SDLC methodology is used in the development of this system because all the resources required to us are already known. Another reason for using Waterfall model is that time schedule can be set on each phases of development and we can proceed through the development process one by one.

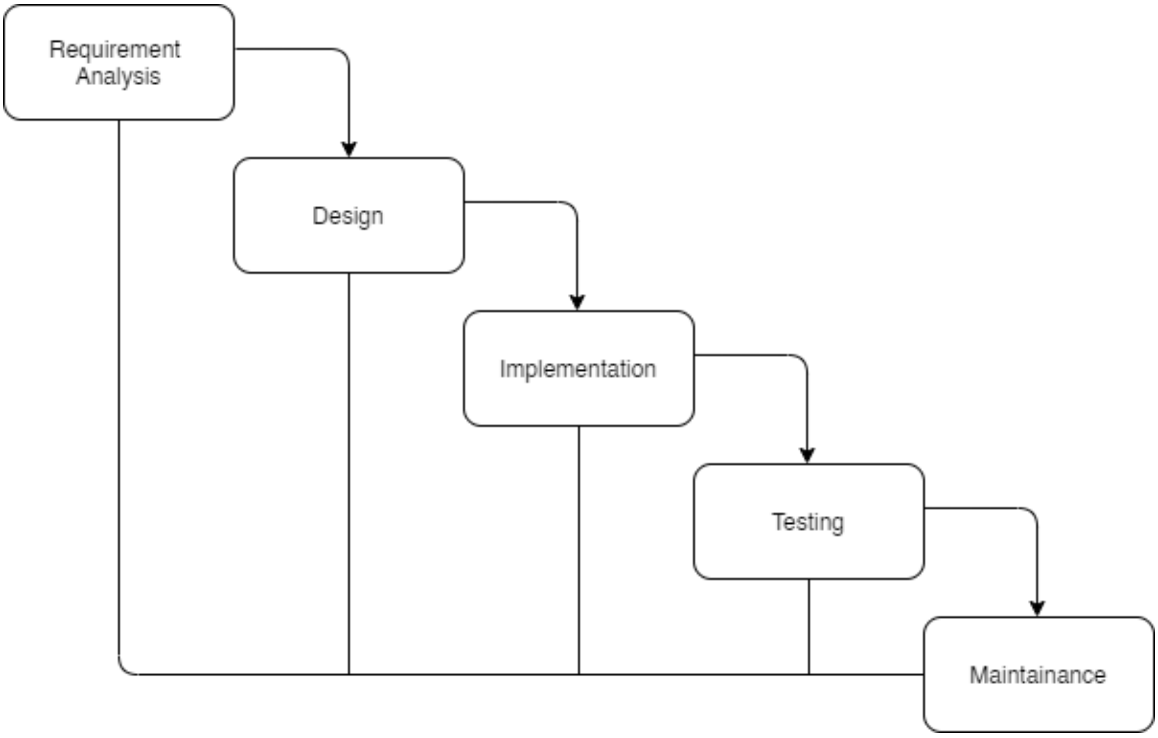

Figure 9: Waterfall Model

The sequential phases in Waterfall model are:

I Requirement Analysis

All possible requirements of the system to be developed are captured in this phase and documented in a requirement specification document.

II Design

The requirement specifications from first phase are studied in this phase and the system design is prepared. This system design helps in specifying hardware and system requirements and helps in defining the overall system architecture.

III Implementation

With inputs from the system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality, which is referred to as Unit Testing.

IV Testing

All the units developed in the implementation phase are integrated into a system after testing of each unit. After integration the entire system is tested for any faults and failures.

V Maintenance

Another important phase of this model is the maintenance model. This step occurs after completion, and involves making modifications to the system or an individual component to alter attributes or improve performance. These modifications arise either due to defects uncovered during live use of the system.

4.1.1 Tools Used

The different types of CASE tools used in the project are:

- Diagram Tool:

The components of the system, and the flow of the data and control between these components are demonstrated by diagram tools by using graphs. “Draw.io” and “Creately” are the diagram tool used in the project.

- Configuration Management Tool:

An instance of software is released under one version. CASE tools help in this by automatic tracking, version management and release management. Git is used as configuration management tool.

- Web Development Tool:

These tools assist in designing web pages with all allied elements like forms, text, script, graphic and so on. Visual Studio Code, Sublime Text Editor, GitHub are used as web development tools in the project.

The different frontend tools used in project:

- HTML 5 (Hyper Text Mark-up Language):

HTML is the set of markup symbols or codes inserted into a file intended for display on the Internet. The markup tells web browsers how to display a web page's words and images.

- CSS 3 (Cascading Style Sheet):

CSS is a style sheet language used for describing the presentation of a document written in a markup language such as HTML. CSS is a cornerstone technology of the World Wide Web, alongside HTML and JavaScript.

- JavaScript

It is high-level, often just-in-time compiled, and multi-paradigm. It has curly-bracket syntax, dynamic typing, prototype-based object-orientation, and first-class functions.

- Bootstrap

It open-source CSS framework directed at responsive, mobile-first front-end web development. It contains CSS- and JavaScript-based design templates for typography, forms, buttons, navigation, and other interface components.

The different backend tools used in the project are:

- Laravel 8:

It is used with expressive, elegant syntax. It is selected and used as the php framework in project. It eases common tasks used in the majority of web projects, such as authentication, routing, sessions, and caching.

- Php MySQL 8.0:

It is used to create database to store information regarding all the posts, users, likes, comments, messages. It is used for syncing information from local host to server using xampp as server.

- Xampp Server 3.2.4

The user uses it to create local server in his machine to check stability of application and response of server during live hours.

4.1.2 Implementation

I Product Module: This module is used to add/update/delete a product from the platform. It helps to display the product on the platform.

II Cart Module: Used for adding the products to the cart of user. By adding the product in cart only a buyer can purchase a product.

III Message Module: This module is used for managing the contact message which is received by the admin.

IV Users Module: This module is used for managing the users of the website. It is responsible for buying and selling by updating details.

V Buyer/Seller Module: This module helps to manage the information and store the information of buyers and sellers.

4.2 Testing

4.2.1 Test Cases for Unit Testing

Each module is considered independently. It focuses on each unit of software as implemented in the source code. Tt is white box testing.

Table 1: AgroPal Launch a webpage

Test case	Scenario	Enter Value	Expected output	Actual output	Remarks
1	Launch without opening xampp server.	Enter php artisan serve in terminal.	Link redirect to webpage	Error because of not opening server.	FAIL
2	Launch with opening xampp	Enter php artisan serve in terminal.	Link redirect to webpage,	Launch successful, redirect to home page	PASS

Table 2: AgroPal User Registration

Test case	Scenario	Enter Value	Expected output	Actual output	Remarks
1	Register without filling any fields.	Null	All fields are required.	Please fill the form.	FAIL
2	Register with correct details.	Name: Aman Bhandari Email: amanbhandari188@gmail.com Password: 123456789 Confirm password: 123456789 Number: 9861436723 Address: kathmandu	Register successful and go to home screen.	Register Successful.	PASS
3	Enter already registered details.	Name: Aman Bhandari Email: amanbhandari188@gmail.com Password: 123456789 Confirm password: 123456789 Number: 9861436723	Register unsuccessful	Email has already been taken.	FAIL

		Address: kathmandu			
4	Enter invalid data	Name: Aman Bhandari Email: amanbhandari Password: 123456 Confirm password: 123456789 Number: 986143 Address: kathmandu	Register unsuccessful	Number must be 10 digits. Email must be valid. Password doesn't match.	FAIL

Table 3: AgroPal User Login

Test case	Scenario	Enter Value	Expected output	Actual output	Remarks
1	Login with correct email and paddword.	Email: amanbhandari188@gmail.com Password: 123456789	Go to home page.	Login successful	PASS
2	Login with wrong password	Email: amanbhandari188@gmail.com Password: 123456	Login unsuccessful	These credentials do not match our records.	FAIL
3	Login with wrong email	Email: amanbhandari Password: 123456789	Login unsuccessful	These credentials do not match our records.	FAIL

Table 4: AgroPal Add to cart

Test case	Scenario	Enter Value	Expected output	Actual output	Remarks
1	Add to cart without login	Add to cart	Redirect to login page.	Redirect to login page	FAIL
2	Add to cart by login	Email: amanbhandari188@gmail.com Password: 123456789	Successfully added and redirect to cart page.	Added successfully	PASS

Table 5: AgroPal Seller Add a product

Test case	Scenario	Enter Value	Expected output	Actual output	Remarks
1	Registered seller try to add product.	Add a product	You are not verified.	Redirect to home page	FAIL
2	Registered and verified seller.	Add a product	Redirect to add a product page.	Added successfully	PASS
3	Not registered seller	Add a product	Register as seller.	Redirect to home page	FAIL

4.2.2 Test Cases for System Testing

It is executing programs to check logical changes made in it with intention of finding errors. a system is tested for online response, volume of transaction, recovery from failure etc. System testing is done to ensure that the system satisfies all the user requirements.

Table 6: System testing of AgroPal seller/buyer interface

Test case	Scenario	Enter Value	Expected output	Actual output	Remarks
1	Launch with opening xampp	Enter php artisan serve in terminal.	Link redirect to webpage,	Launch successful, redirect to home page	PASS
2	Register with correct details.	Name: Aman Bhandari Email: amanbhandari188@gmail.com Password: 123456789 Confirm password: 123456789 Number: 9861436723 Address: kathmandu	Register successful and go to home screen.	Register Successful.	PASS
3	Registered as seller.	Company name: Tarkari Pasal Email: pasal@gmail.com Pan number: 234567891 Phone number: 1234567890 Address: Kathmandu.	Register successful.	Redirect to home page.	PASS
4	If not verified by admin.	Add a product	Not verified by admin.	Redirect to home page	FAIL
5	If verified by admin.	Add a product/ view product/edit a product.	Successful	Successful.	PASS
6	Search a product with valid name	Mango	Product found	Here is the product.	PASS
7	Search a product with invalid name	Aap	Product not found.	The product is not available	Fail
8	Add to cart by login in.	Add to cart.	Successfully added and redirect to cart page.	Added successfully	PASS
9	Buy now	Buy now	Successful	Redirect to home page	PASS

Table 7: System testing of AgroPal Admin interface

Test case	Scenario	Enter Value	Expected output	Actual output	Remarks
1	Launch with opening xampp	Enter php artisan serve in terminal.	Link redirect to webpage,	Launch successful, redirect to home page	PASS
2	Login as admin	Email: admin@gmail.com Password: 123456789	Login successful and go to home screen.	Login Successful.	PASS
3	Dashboard/ register seller	Verify	Register seller can only add a product.	Successful	PASS
4	Dashboard/ Product details	View and verify	Verified products only can be displayed.	Successful	PASS
5	Dashboard/ Orders	Make successful/unsuccessful	If successful then it will be delivered	Successful.	PASS
6	Dashboard/ Contact message.	Read message	Read	Successful	PASS

Chapter 5

CONCLUSION AND FUTURE RECOMMENDATIONS

5.1 Lesson Learnt/Outcome

There have been several improvements in our programming language and writing skills as well as our time management skills while doing this project. It was difficult at the beginning because it was our first project and everything was new. Although it is our first project it turned out to match all the expectations. A lot was learned about proper time management as the project had to be submitted before the deadline along with the documentation.
Although it is expectedly good, some new features to this system could be added in the upcoming days to make it more user friendly and efficient.

5.2 Conclusion

With the completion of the project, it has been able to boost academic knowledge and bring it to real practice. The experience of working in a team and maintaining cooperative behaviour has been got. The use and implementation of web-based application has been learnt by the project. Throughout the period, all technical and non-technical stuffs have been learnt in a healthy environment.

The project is done by using php framework Laravel and HTML CSS (bootstrap) in Visual Studio Code. It shows all the information regarding the products added. This application is made to simplify the living style of people making them easy to get organic products. The main objective of this application is to build a web-based application for people to get proper and healthy products as well as to for farmers to get proper amount for their products.

Thus, working in a group for the project, also a novice in field of web application programming with very minor knowledge was a challenging task but was very much worthwhile to learn and experience.

5.3 Future Recommendations

The applicability and usage of this project can be increased by enhancing the system based on the limitations. This helps to uplift the productivity of the system. Features like a digital payment can be added that can help in limited usability of paper money. Also, Order tracker may be used which makes buyers easy to know where is his/her order.

Also, more capabilities can be delivered in the future to increase the competency and productivity of the team.

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