Project Documentation

Project Title: Smart Poultry Village

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Coursework – 1682

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Project Files Link: https://github.com/mrshiam/SmartPoultryVIllage

Video:

https://drive.google.com/file/d/1zBpwMQdhHkWFyNnmqJbcQi0cq1MhR5uJ/view?usp=sharing

Abstract

A methodology has been followed while developing this project, because a successful project or a quality report is not possible without following any methodology. The methodology that has been followed to develop the system is **DSDM** (Dynamic System Development Method), and the whole system has been documented following this method. This agile methodology used for planning and maintain the developing process. The **proposal** that was planned before the development of the project is given in this document to facilitate a better understanding of the project. Some of the problems of the project have been discussed along with the possible solution of this problem are documented in the **problem domain and possible solution** part. Ethics has also been taken into consideration during the development of the project, **LSEPI** have been discussed in the Legal, social and ethical issues and consideration to produce a standard project. Project planning, test planning risk management plan all these plans are done in **Planning** section to ensure about the efficiency of the system. Which methodology is used for this project are discussed in Development method and tools. Technical, economical and operational chances, probability of different cost is highlighted in **feasibility study**. **Requirement analyzing** discussed to identify business needs and more clarify about the business goal. System design and architecture are documented in this report to present the required diagrams (ERD, Use Case, Rich picture) for the system. The **testing** part for test the system, and the **deployment** process are also covered in this report. Project evaluation and product evaluation also kept in this report in **evaluation** section. Weakness of the system and strength of the system are descried in **Critical appraisal.** In this report **lesson learned** are discussed to describe about what I have learned from this project. And this report is finished along with a **conclusion** of project goals, fulfilled goals, not fulfilled goals and future implementation.

Acknowledgements

A proper guideline is mandatory to gain success in any work. And for successful project guideline there also need proper instructions and guideline. In the development of my project I got so many supports for developing a successful project. I have given limited time for completing the project. Without those support I could not make a successful project within this time. At first, I would like to thanks and pray Sukhria to Almighty Allah for giving me the ability to do the project and keeping me fit and safe me from all kinds of health disease. Then I have to thanks my family for giving all kind of support while developing the project. They always encourage me to do my work for the project. When I faced any complexity in development, they always gave me mental support. Then I would like to thanks some people who gave support and guides me throughout the project development process for completing a successful project. Md Rakibul Hasan my supervisor who always guides me in development process and helps me understand the business goal and objective that need to be met by the system. I would like to thanks our course coordinator Mustafizur Rahman for his continues guideline in documentation and suggestion in development process. And at last I am so pleased and happy for completing the project and I have learnt lots of things from this project.

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1. Introduction

Domestication and rearing of birds like chicken, turkeys, geese, swans and other domestic bird for providing meat and egg food is poultry. (Priyadarshi, 2020) And when a large number of poultries real up in form of animal husbandry than it is called poultry farming. Beside animal husbandry technique or culture that helps to maximum the efficiency of production with the investment of minimum investment. (Portal, 2015)

1.1 Background

Poultry farming was probably found out at South East Asia. Passes of the time this rearing poultry spread though out the world. Egyptians practiced incubation of hens using dung heaps. Day by day the demand of meat and egg are increasing. And from rearing backyard of house to start practicing poultry farming. And at the end of 19th century and starting of 20th century poultry farming created a real industry. Poultry Industries plays an important role in providing meat and egg in the market. And currently almost 60,000 million chickens are fattened and eaten in very year and 4,500 million hens gives almost 300 million dozen in a day. (Hipra, 2020) From a statistic it has found that 35% of meat production comes from poultry and 25% protein efficiency comes from Eggs. (Roser, 2019)

So, it is clear that poultry industry has a huge market in case of meat and egg production. And as the demand is increasing day by day. From ancient time rearing of chicken practice took place in house backward. By increasing the demand, it is now having its own industry. And this helps to improve the financial condition of people. And for poultry farming it needs very low investment.

But for getting maximum production of the meat and Egg there need to be a good management system to manage the poultry farm which will increase the efficiency of production of meat and egg. So, Poultry farm Management system will play a vital role to increase the efficiency of production both in meat and egg.

1.2 Aims

The Major aim of the project is to develop a management system to manage a whole poultry farm. Besides this there are some certain aims which are given below:

- Manage a poultry farm Income section digitally.
- Manage a poultry farm Expense section digitally.
- Manage a poultry farm daily consumed items by chicken digitally.
- Generate dynamic reports.

1.3 Objectives

To achieve the goal of developing a success full and desire system I need to accomplish some objectives and these are given below:

- Provide a user-friendly web-based poultry farm management system.
- Enable user to register and access to the system.
- Enable user to manage farms chicken.
- Enable user to manage chicken's providing food.
- Enable user to manage chicken's providing medicine.

- Enable user to manage chicken's transportation cost.
- Enable user to manage employee of the farm.
- Enable user to manage customer of chicken.
- Enable user to manage other expense of the farm.
- Enable user to manage egg production.
- Enable user to generate report for farms loss and profit.

1.4 Scope

The finishing result of the developed system will produce a Management System which will help to manage any poultry farm. Here System user can manage whole farm using the system. User can make track of buying and selling chicken. Beside user can track all the buying foods, medicines and other elements for rearing up the chicken. User can track the daily giving foods, medicine to the chicken. Employee salary, customer details all can be stored. And user will able to produce report of all data stored and can generate report for profit and loss of the farm. There are some services which will not be implemented that will be scope limitations. And that limitations of scope are given below:

- There will be no online order for buying chicken.
- Customer will not pay online for buying chicken.
- Employee salary will not be given online.

1.5 Nature of Challenges

For completing the whole project, I have to face lots of challenges. And the first and foremost challenge is completing the whole project alone. As it is an academic project so the whole project needs to be completed myself. I need to perform the task of Analyst, Designer, Developer and tester. It's a challenge to perform all the task by myself. Project submission deadline is another challenge for me to perform the all task alone and submit the project within the deadline. Another big challenge is beside performing all the role task I need to write a report for the whole project by myself. Testing all the objectives tasks to reach the aim of the project and writing a whole report for the developed project is the most difficult and challenging for this project.

2 Literature Review

2.1 Approach to literature searching

Literature review is an extensive summarization of previous research of a topic. For a particular problem domain of research literature review observe relevant articles, books, journal and research paper. A literature review should publish evaluation, summarization, description and clarification of previous research on a problem domain. Literature review acknowledge the work of previous researcher and whom are currently working which assure the readers that this review work is well done. And mentioning previous work of other researcher readers assume that author study, evaluate and added the work in the current review work. Literature review gives reader a full perception of the development in working field. Literature review shows weakness, strengths and problems of the existing solution of a problem domain to the readers and recommend solutions. Poultry Management system where a poultry farm will be managed using web-based application. Here poultry farm owner/user can track whole poultry farm activity. In literature review

chapter I will discuss about this problem domain poultry management system. Evaluate, summarize and clarify the existing work of the problem domain.

2.2 Identifying the Problem

Management System is achieving objectives in order to manage interrelated part of an organization. (ISO, 2020) And Management Software is that which is designed to automate and streamline managing process with the aim of reducing the complexity of large tasks and projects in addition simplify collaboration. (techopedia, 2014). A well-structured Management System Software can increase the productivity of business, reduce manual efforts, minimize mistakes in information, enables collecting, managing, and controlling information of the business, helps to take faster decision and errorless calculation for the business. (Prism, 2020). The origin of Management Information System was in 1801 in an industrial exhibition in Paris. (Weedmark, 2019) Firstly, MIS started to in computers in 1970 and firstly used to calculating data and compiling it into reports. In early 1990 MIS got famous due to internet and small business start to afford this system. (Weedmark, 2019) Today there are lots of MIS for different business. Management System software have some limitations also like expanses of implementing and developing the software. (Vitez, 2017) Upgrading technology with the current technology could increase the expanse. For maintenance and training there need to invest money. As technology change frequently so for training there would be added training cost. If unimportant and un-essential data stored in the system than it will be total waste of time and poor decision could be taken. (Vitez, 2017)

In poultry industry due to lack of proper management system poultry industry is not gaining its original production and profit. It is tough to integrate different data like, number of chickens, hatching of egg, medicine and food of the poultry farm by keeping manually. It is difficult to produce different report from manually stored data for decision making. It is kind of impossible job for farm owner to make balance sheet, account sheet and get cost per production of egg and

chicken and hard to calculate the profit and loss when needed. Farm owner finds difficult to track down the inventory for food, medicine, egg while selling and buying them. They find difficulty managing and tracking down employee and their salary.

2.3 Present Condition of Poultry Industries in worldwide

1. Consumption of poultry meat in developing country increased by 35 million tones in percent 45 to 54. Which is double of developed country. (pixelsutra, 2018)
2. Increase the production in developed country from 42 to 57 percent. (pixelsutra, 2018)
3. There is generally a positive relationship between per capita consumption of poultry products and per capita incomes.
4. Developed country and developing country's commercial poultry industries started vertical integrated operation.
5. Poultry prices are expected to increase over the period 2005 to 2030 at 0.2 percent per year. (pixelsutra, 2018)
6. Brazil has overtaken the United States of America in terms of chicken-meat exports, expanding by 21 percent from 2000 to 2005, largely due to increases in production and in demand from foreign markets. (pixelsutra, 2018)

2.4 Present Condition of Poultry in Bangladesh

1. In a year in Bangladesh the growing rate of poultry farm is 15%. (Ahmad, 2019)
2. According to USDA (United States Department of Agriculture) currently poultry farm sector has 35,000 crore investment which will be double in the next decade. (Ahmad, 2019)

3. USDA also added that there is 1 million entrepreneur and million are directly involved in poultry sector. And they commercially produce 10.22 billion eggs and 1.46 million tons of meat in a year (According to March 20 Report of USDA). (Ahmad, 2019)
4. The Livestock and fisheries ministry say that 15.52 billion eggs are producing currently against 17.13 billion demand in a year. (Ahmad, 2019)
5. Poultry sector supplies about 36% of protein of the country by consuming meat and egg. According to USDA 95 eggs are eaten per capita and 605 kgs chicken meat are consumed. (Ahmad, 2019)
6. Relationships among the poultry farmers associations were not cooperative.

2.5 Technology in Poultry Industries

Technology brings lots of changes in poultry industries. It helps to farmer to manage huge amount of birds at a time. Technology substitute labor cost and brings more productivity to the labor. Beside this technology exploit in improve breeding, fecundity, growth rate, produce more birds in a year, controls diseases and decrease the mortality of the birds. Poultry Management system enables to manage the birds. It helps to increase the production of birds reducing the cost of farmer. It helps to reach a significant economics goal for a farmer.

2.6 Influence of not using technology in Poultry Industries

Lack of technical efficiency created a burden to handle the poultry industry and Chicken rearing, disease handling, production rate was greatly influenced by inadequate knowledge of technology. Low level performance, decreasing production rate, unethical activities, unable to use optimum capacity, lower level revenue were the ultimate result of weak operation management system. That's why the areas of marketing operations, financial system and quality control management

system were found inappropriate. management system was absent in poultry industry which was ultimately hampering the production. Inappropriate Management Information System (MIS) hampered the proper collection, processing and dissemination of information to the poultry industry. Sufficient facility for laboratory testing was not found at most of the poultry industries, as a result the causes of diseases sometimes remain unknown.

2.7 Problem Domain and solution

2.7.1 Choosing Technology

Technology need to be chosen for building the solution. If developing team have not enough knowledge about the technology that have chosen than they cannot build the solution. If chosen technology does not have the ability to develop all the function and feature of the project than project lead to fail. (Wayner, 2020) Beside this if the chosen technology is outdated this also leads towards failing project.

Solution:

The technology should be chosen considering that all the functions of the proposed solution can be made. (Wayner, 2020) And technology which are not outdated. The development team needs to have enough knowledge about the chosen technology. They need to acquire full knowledge to develop a successful project.

2.7.2 Poor Communication

62% of the employee hates their job due to lack of communication. (Scalers, 2020) Poor communication can lead a developing solution towards failure. Without proper communication it is hard to understand the goals and vision of the project to the team. And if there is a complex

environment where team members afraid of asking any question about anything about the project with members and project manager than project goals will be not fulfilled. Due to lack of communication the project will fail badly. And communication with the client must go on what they want in their solution what they don't want. If there is lack of communication with the team and the user than an unsuccessful project will be developed.

Solution

Project manager or who manage the project clearly understand the project goals and vision to the team members. Understand the rules to the team. (Kośnik, 2020) Make sure everyone understands project goals. Besides, an environment needs to be created where every team member can easily communicate with each team members even project manager. And keep communication with the client. Inform any update, delays and changes that team makes. Discuss any minor or big problems developing the project. This communication with team members and client will make the project a successful project to be developed.

2.7.3 Requirements Gathering

Requirement Gathering is one of the fundamental steps of developing any system solution. (Stafford, 2015) The process in which a list of requirements generates by user or customer is called requirement gathering. Requirement gathering helps to understand what needs to be developed. These requirements tell developing team what needs to be built. And from these requirements developer gets the goals and objectives of producing solution. Its helps to take decisions on particular solution. A poor requirement gathering can misunderstood goals of the project and leads the developing solution to the fail project.

Solution

There is no scope of assuming customers need. Customer should ask for the requirements. A full well written documents of requirements should be produced with the help of customer before signing the project. On daily basis a user who will be using the solution will be involved with the developing team while developing the solution. (Stafford, 2015) Different types of requirements gathering process should be conducted for gathering requirements. And this will help to create a particular goal and objectives of the project from requirement gathering and help to develop a successful project.

2.7.4 Poor Planning

Benjamin Franklin said “if you fail to plan, you plan to fail”. (Zone, 2019) 55% project failed due to poor planning as primary reason. (Scalers, 2020) The main project failure reason is lack of planning. This is the first step towards developing any system. Without proper planning there is confusion between the team who is responsible for what. When the developed solution needs to be delivered. In which approach teams need to work. What is the goal and objectives of the project? What is the methodology of developing the solution? In what budget they need to finish. If team members don’t know the aim what they are working for and this low down their productivity. Finally, these all will lead the project to be failed.

Solution

A proper planning should be made while starting the development work. Senior management member should be involved in planning. (Smale, 2019) A good and relatable methodology should be chosen for the project while discussing with the team. No prediction will be allowed while planning. Involving customers in the planning analyzing the problem domain, past experience and data gathering a proper budget and time estimation should be made for the project. (Limited,

2019) Every team member would be understood their role and responsibility by conducting daily or weekly basis meeting. And this planning will help to build a successful project solution.

2.7.5 Resistance Change

Technology change every day. In the development of project there may come changes in many fields like requirements, functions, interface. (Grebennikov, 2018) This change may be mandatory for the system. If this change is not done than the main aim of building the project will be failed. So, the manager, developer all will have the ability to execute the change when needed. If there is no scope of accepting the changes while developing the system than the system may not fulfill its demands and a backdated software may be build and which may not fulfill the business needs that user or customer wants. And ultimately developed system leads towards failure.

Solution

For making a successful software changes should be accepted by the developing team and management people. And user should also understand making changes may cost some more money and time and this change is to fulfill their needs. (Grebennikov, 2018) And this should be discussed with the development management before starting the project. And developing team also be aware of accepting any changes which fulfills aims of the project. And build a successful project for the user as their business needs.

2.7.6 Maintenance

Maintaining a developed project is a very difficult task. If maintenance is not done properly than system will not work properly. There might be found bugs which may slow down the system activity. Capability of doing work may decrease. Many functions might get outdated. Performance

of the solution may slow down. And if maintenance not done there will be time where the system does not fulfill the business needs. And solution do not come to any work for the user. And user may need to develop a new system.

Solution

For maintaining the project solution development team need to make a proper documentation of the system solution. This documentation makes the maintenance work easier. And maintenance will keep the solution updated, robust and bug free. Maintenance of system solution will be less than the cost of building a new system.

2.8 Recommended Approach

In this particular problem domain there are not enough solution. From depth analysis I have found some solution how this system should be developed before going to development phase. And for this after analysis and research I have identified some important requirements and business goal that need to be consider before development. And for this the recommended approach are given below:

- ❖ All the data of the farm need to be stored securely.
- ❖ All the data of the farm need to store organized way that is helps to make any kind of report easily.
- ❖ A dashboard should be developed where user can easily all the reports and data of the farm.
- ❖ The data of user and farm need to be stored securely.
- ❖ Automation of the system need to be developed so that user don't need to do anything manually.

- System should be developed such a way that there is no need of paper or sheets for calculation.
- Reports of buying and sell need to be generated and that need to stored securely.
- Data should be shown such a way that user can read understand the shown data.

3 Product Research

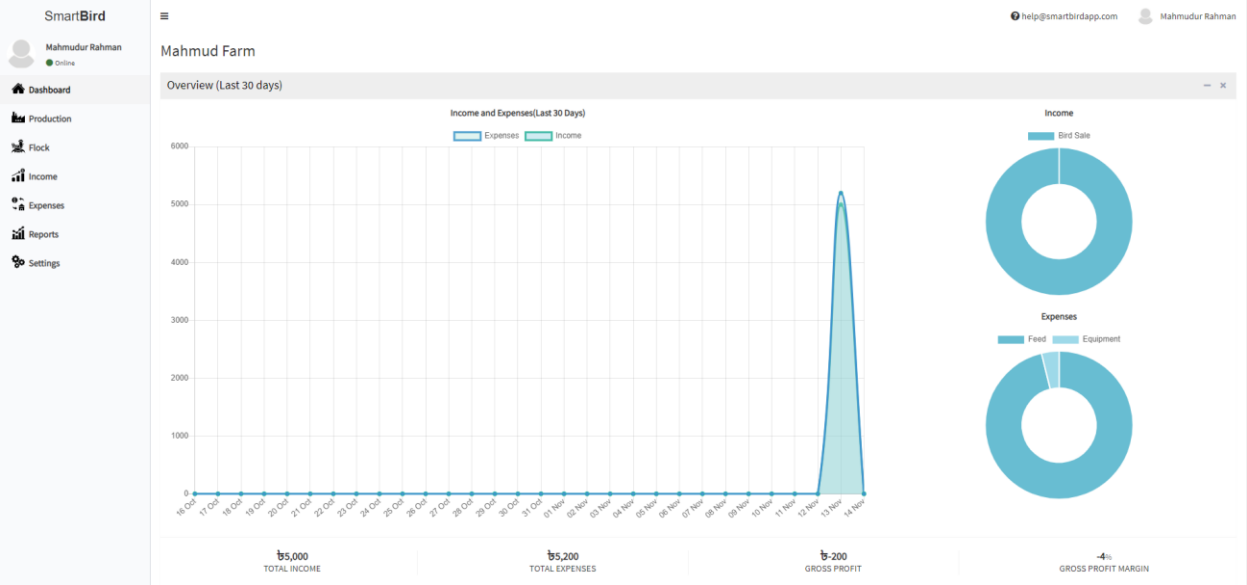
Review of top three leading solution in this problem domain

Poultry Farm Management system will help to manage, monitor and increase production of the poultry farming. Here some of the leading existing system will be discussed. Here the strengths and weakness of the system will be discussed. This existing system review will help to understand the system design, system navigation, user interaction with the system and system's working capabilities.

3.1 SmartBird

SmartBird is online application to manage poultry farm. This can be used to manage big poultry farm and backyard Poultry farm. With this application poultry egg collection, bird weight, vaccination, treatment, mortality, income and expenses all can be managed and tracked. This application also can identify mistakes and helps to prohibit to do so in future. And help to make budget decisions.

Website url: **https://smartbirdapp.com/**



3.1.1 Strengths

- All the elements that are managed by the application are kept is organized way.
- This have easy navigation system that's why any user can use the application easily.
- Application have understandable dashboard which shows the summery of expanse and income of the farm with graph.
- Production of the farm are shown with proper details of bread and its Batch.
- Flocks data are stored in organized way showing their proper information like stoke, age.
- There is proper tracking of vaccination on the system.
- It has a customization system of adding income and expense categories.
- Income and Expanses data stored with details.
- Report of expanse and income can generate using dates.
- There is a good search option to search for specific object of the application.

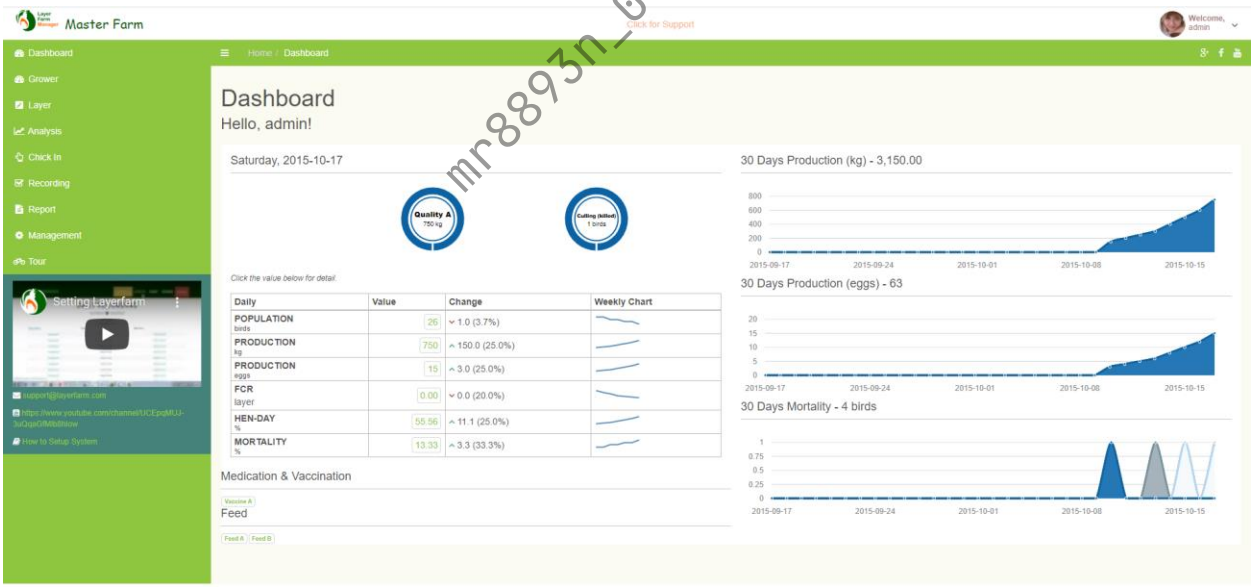
3.1.2 Weakness

- The purpose description of income and expense are not stored properly.
- The user interface is not easily understandable to use. User will need time to understand many things of the system.

3.2 Layer Farm Manager

Layer Farm Manager is poultry and egg production management software. Using this user can monitor egg production and manage Poultry rearing production. User can manage bird mortality, feed consumption, daily cost and others about poultry. This management software also provides necessary data to analyze and helps to increase production of egg and poultry.

Website url: **http://www.layerfarm.com/**



3.2.1 Strengths

- This software has the ability to store all kinds of data about poultry and egg production.
- A tour guide is provided to understand how to use the software.

- This software can do analysis of the data according to the provided date.
- A dashboard of showing data about production, day cost, mortality, feed and vaccination in table and graphs.
- Managing flocks in different location and sheds can be tracked using this software.

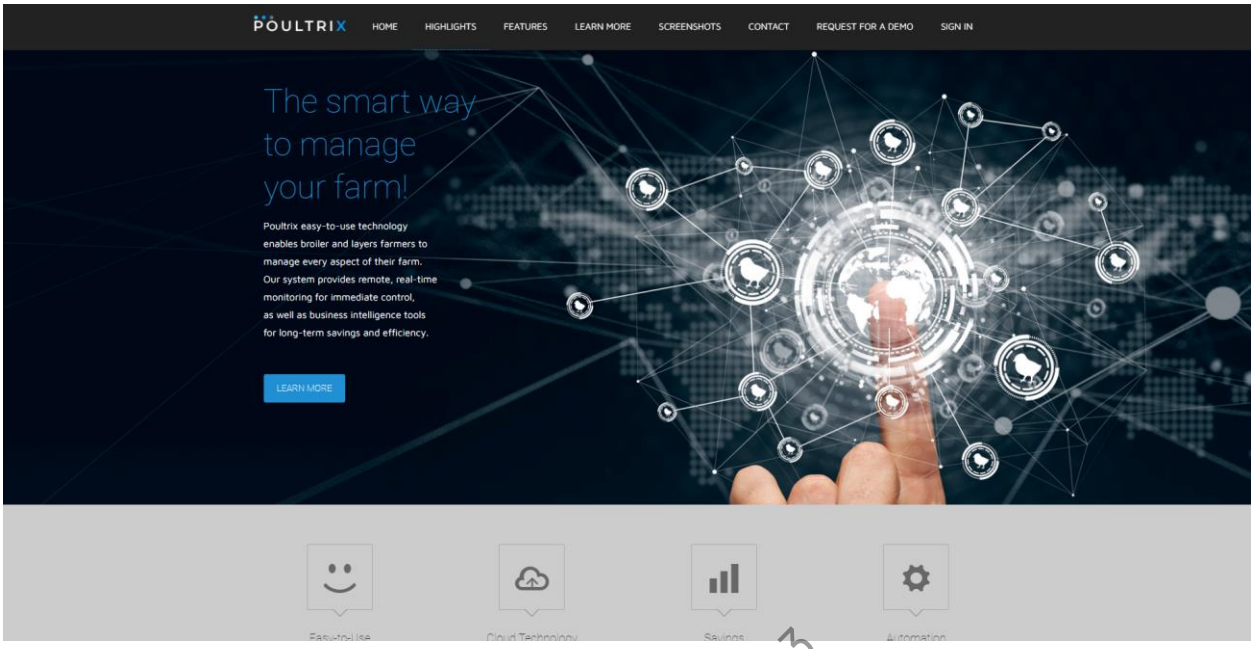
3.2.2 Weakness

- The navigation of the software is so bad any user will find it difficult to use.
- This system software is filled with so much bugs and error.
- User interface is so difficult to understand. No one will find the interface easy to understand.
- All the elements that I mandatory to manage a farm are not present in the software.
- The software works so slow and takes huge time to generate report in particular object.
- Graph report are not understandable.
- Tour Guide does not show all the functions of the system.
- Storing data are not organized and it's difficult to understand where the data need to be provided.

3.3 Poultrix

Poultrix is poultry management technology which helps to manage farm remotely. This technology helps to manage mortality, daily consumption, storing data and analyzing the data. It provides efficient planning to control the farm and notify for doing different task that need to do for the birds.

Website url: **https://poultrix.com/**



3.3.1 Strengths

- Data can be stored automatically and manually by this system for the birds.
- Data are stored organized way for every object that are need for managing the farm.
- Dashboard shows every kind of data in graphs and dynamic tables.
- It is a cloud bashed technology user can easily access to the system from anywhere using internet through web or mobile phone.
- Farmers get notification and necessary information from the mangers of this system after analyzing the data of farmers farm.

3.3.2 Weakness

- Uses of advanced technology which would be not understandable by the farmers of the poultry farm.
- The system navigation is complex to navigate and understand.

3.4 Weighted Scoring Models

Evaluation Criteria	Weight	Smart Bird	Layer Farm Manager	Poultrix
Usability	20%	8	5	8
Accessibility	15%	8	6	7
Security	20%	7	5	8
Adaptability	15%	8	5	7
Customization	15%	7	5	8
Capacity	15%	7	6	8
Total Weight - 100	100%	75	56	77

Figure 1: Weighted Scoring Model.

3.5 Recommended Approach

After analyzing three solution there are some recommendation for improved and less weakness system solution are given below:

- Need to be user friendly.
- Good security system to protect data.
- Navigation should be easily understandable.

- Enables good management system.
- Meet business need of the user.
- Robust System.
- Generated report should be peoples understandable.

4. Legal, Social, Ethical and Professional Issues and Considerations

Legal, Social, Ethical and Professional Issues makes impact while developing any system. And for this reason, these issues need to be considered while developing any system. These issues are discussed as follows

4.1 Discrimination

According to **American Psychological Association** unfair or mischievous treatment of people and group for possessing certain characteristics like, gender, race, age, sexual orientation and religion is Discrimination. (Association, 2019) If discrimination occurs in work place than this will affect in the business of the company. And discrimination occurs when any employee of the company treated unfair for any of the above discriminate reason. Discrimination not only impact on business process but also the person who experienced it. According to National Institute for Health research discrimination have physical and mental effects on the person who face this. He or She may suffer for high blood pressure, obesity, aches and pain physically and suffer from depression and loss of self-control mentally. (Etheridge, 2015) For discrimination employee cannot work properly. And this makes a negative impact in the company work environment. Everybody is equal and same there will be no discrimination in the work place like farm or big company. For this reason, any kind of discrimination will be not allowed in poultry farm industry.

4.2 Security & Data Protection

Security and Data Protection is major issues of a management software. In a management system the primary goal is managing data. And that data needs to be managed securely. And while developing the system it is important to implement a strong way of protecting the stored data. And for this there are some issues discussed below for the security and data protection of management system software

Using Strong and Unique Password: It is a best and secure way for accessing any data by proving password. As the system is management system and web based than for accessing data there should be username or email and password to access the data. If the password is weak than any hacker can crack the password and get unethical access to the system. So that a strong and unique password is mandatory for accessing the data of the system. And this data cannot be shared with others. (Maine, 2020)

Right Access: It is mandatory to give the right access to the right person. If it happens than unethical work may occur. Like user cannot have the access of the admin in the system. If it does than He or She can delete any important information or stole data of other user. So, providing right access to the right person of the system should be ensured.

Using Antivirus and Schedule Scan: In the system there is possibilities of getting different type of virus, malware attack. Which can damage the data of the system sometimes it may crash the whole system. So, it is mandatory to use Antivirus for the system and Schedule scan should be performed for the system. (Maine, 2020)

4.3 Software Licensing

Software License is a document which allows customer to use the software. (Burkett, 2018) Software license allows the customer using the software following the rules and agreement. Using software without license agreement can be the violation of copy right law. And for a management

system software. Software License is important because anyone can software and can modify to develop a new system. Sometimes one can earn through Software License. When a single user license software needs to be used by multiple user than every user needs to buy the license of the software to use it. (Writer, 2017) So, for Management System software it is mandatory to use license software. Using license software will assure not violating copy right law. Software license will save money for the Farm and sometimes this can earn money for the farm.

4.4 Legal Impact

Legal impact is when any issues that breaks any law. Poultry Farm Management system is a web application which will be used to store data in such a way that user can manage their farm using the application. Beside the data of poultry data of poultry buyer and employee who works in the farm their data will also be stored. For that reason, legal issues may arise if data of the employee and buyer is leaked or hacked from the system. Buyer and employee can take legal action against the application and application owner losing their data. If the data of customer sold to other people without giving knowledge to them or money than buyer can take legal action against this work. Legal issues may arise if product liability is not filled properly. If owner of the application sells the product to do some specific work and product cannot do so than the application buyer can go against the application owner. (D.D. Lowry, 1995) As the application is web based than it needs to be hosted. And the domain name for hosting should be unique. If it matches with any other web applications domain name than they could take action violating copy right law. So, to get rid of these issues a strong, secure database need to be developed. Data would not be shared to other for personal benefits and application need to work as it shown to the buyer of application. And finally, a unique domain name should be chosen to host the application.

4.5 Social Impact

Social impact is any issue that effects any person's social life living. In the web application of Poultry Farm Management system, it will store data of chicken, chicken's food, chicken's medicine, chicken buyer and employee. If the data of chicken buyer or employee are stolen by phishing, hacking or spamming from the web application. Then this data will be misused by the hacker. And for this reason, the person whose data has stolen can face different problems. And this will arise social issues. Victim will face cyber bulling and cyber-stalking. Victims user data may be used by the hacker in different place to do illegal work. (Rahaman, 2016) And this will also arise social issues. Victims could suffer from different mental stress and pressure for facing these issues. So, the developed web application needs to make secure. Database should be secured using firewalls. Regular audit and monitoring should be performed in database activity. (Rubens, 2016) For facing any kind of phishing and spamming Antivirus should be used and schedule scanning should be done.

4.6 Environmental Impact

Environmental impact is issues that directly or indirectly pollutes our environment or disturbs environment ecosystem. While developing web application there will be use of electricity. And after completing the development the application needs to be hosted in a web server. That web server also needs to run 24/7. And that server consumes electricity. And there the needs of electricity increase and for filling the electricity needs. More fossil fuel burnt. And burning fossil fuel pollutes the environment. So, development should be done following Green IT and hosting should be done using Green hosting can minimize environment pollution. (WILLOW, 2017)

5. Development Tools and Techniques

It is very important to plan before starting any work to do the work in a beautiful way and to reduce the tendency to make mistakes. Proper planning before starting a system development helps a

lot to complete that system successfully. It is impossible to expect a successful project without a proper planning. During system development, each of its work should proceed according to plan. There are several types of methodology that can be used during software development planning. It is impossible to get a good project without proper planning and proper planning is not possible without following a development methodology.

5.1 Necessity of development methodology

Development methodology is a framework to structure, planning and controlling the system developing process. Before starting the development process estimated schedule, identify requirements, planning need to be defined to get a successful system, this predefined approach is known as software development methodology. Software development methodology makes aware how to build a software (Technologies, 2015). Development methodology helps to provide a system with good quality. How much time and effort would be required for developing the system can be measure by using developing methodology, it also helps to complete the system within the required time. During planning software development methodology helps to be aware about the problem which would be occur in the system and it will helpful to reduce the occurrences beforehand, that is helpful to get a maintainable system at an affordable cost. Development methodology assist to know the requirement and set the business goal. Development methodology helps to define the route to followed for developing the system and improve the tools, techniques and practice to produce the final system (bartleby, 2020) with successful deliverable.

5.2 Comparisons among different methodology

A well-managed system works behind the success of a project. To manage the system proficiently, Software development methodology should apply by the manager of development team. There are different types of methodology as Traditional Methodologies (Waterfall), Agile Methodologies (DSDM, SCRUM), Rapid Application Development (RAD). All these methodologies have different strength and weakness and different reason to apply. And comparison among different methodology are given below:

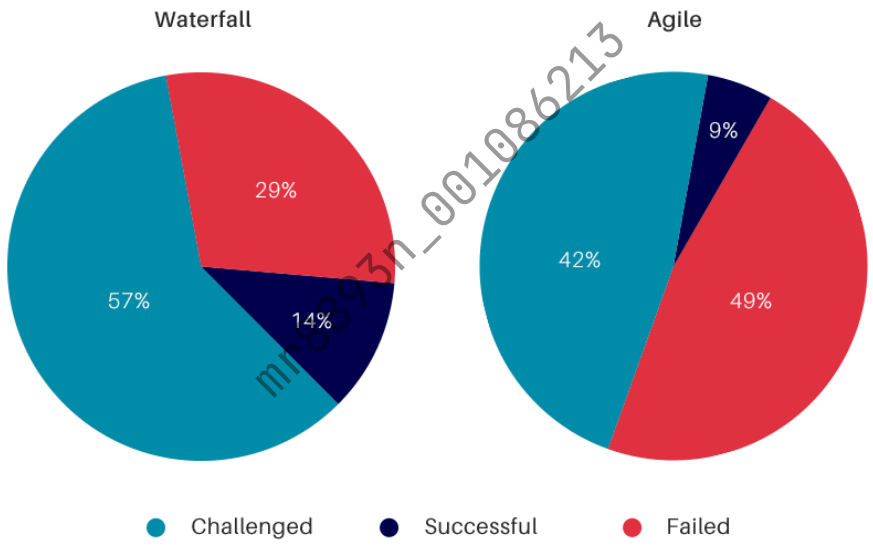


Figure 2: Comparison through success, challenged and failed percentage between waterfall and agile methodology (hiteshi, 2020)

5.2.1 Waterfall Methodology

The most traditional methodology is waterfall development method. This method is divided into six phases. Each phase of this method must need to complete to start the next phase, it is tough to escape any phases, because developer will not be able to start next phases without completing

the previous. All six phases need to complete one by one, for this it is a sequential method. Six phases of this method carry out specific activity. (tutorialspoint, 2020)

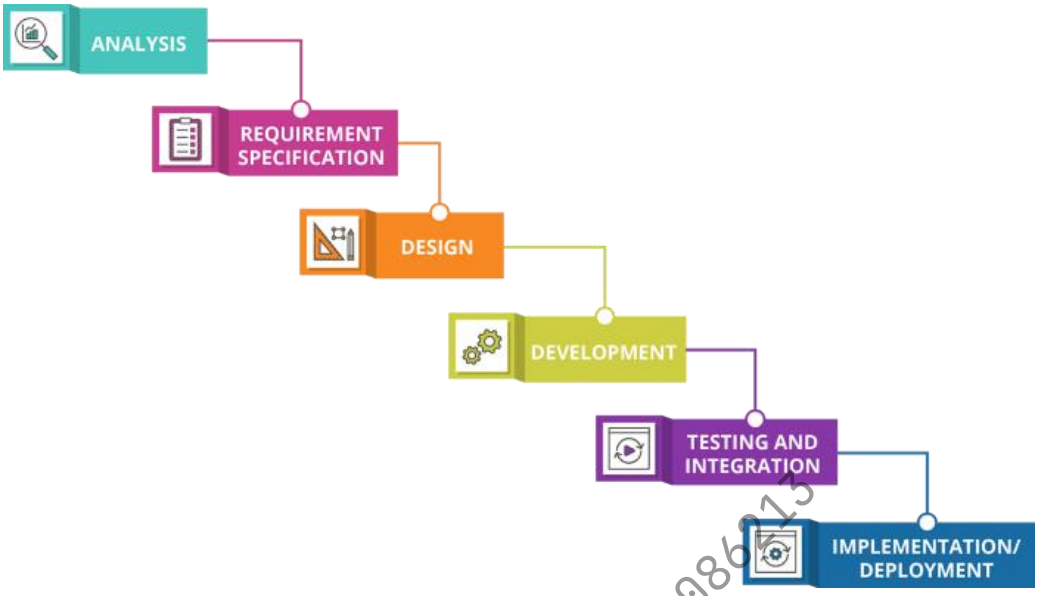


Figure 3: Waterfall Model (joneswaddell, 2019)

Advantages of waterfall model

- During development **requirement can change**.
- Waterfall is a **simple method** and easy to use and understand.
- **Well defined** method for small project.
- The working process and the final outcome **specifically documented** in each phase of developing cycle. (guru99, 2020)

Disadvantages of waterfall model

- Unsuitable for large and **complex project**.

- Once a phase complete then it is not possible to go previous phase if there need any changes.
- Takes a **long time** to be documented.
- Taking customer **feedback** during development is not possible.

5.2.2 SCRUM Method

SCRUM is a development framework from Agile methodology. It is a teamwork development method and iterative process. Each iteration structured with 2-4 weeks sprints, and each sprint works for completing the important requirements at first, in this way other sprints work for rest requirements. SCRUM grant few iterations to deliver a project with fulfilling all the requirements from customer (Daily, 2020) and a sprint focused by the scrum team to increase the improvement of the project.

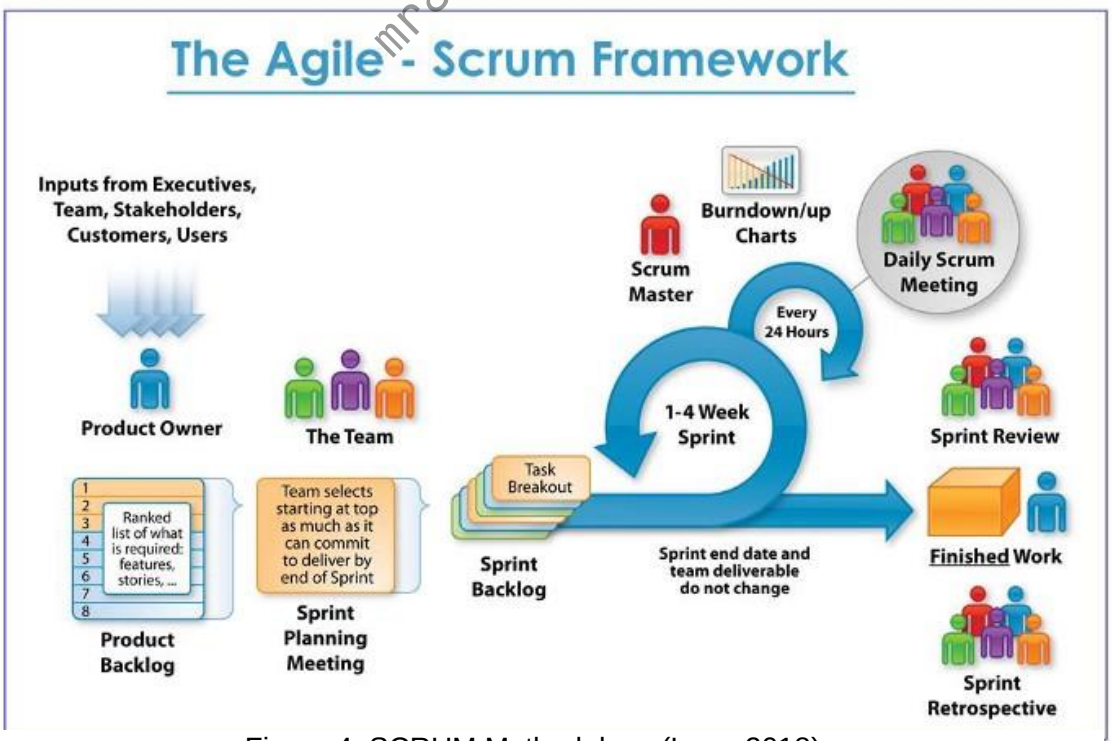


Figure 4: SCRUM Methodology (Lara, 2018)

Advantages of SCRUM methodology

- A **large project** can do through dividing the whole project into several sprints.
- It is a **quick and efficient** framework.
- Supports to take customer **feedback.**
- Based on customer feedback **changes** can done in sprints.
- SCRUM is beneficial for completing a project in **effective budget**. (Chandana, 2020)

Disadvantages of SCRUM Methodology

- It is challenging to apply SCRUM in **large team**.
- Does not support **unexperienced** team member.
- Project failure tendency are high if team member is **non-cooperative**.

5.2.3 DSDM Methodology

DSDM is an iterative framework from agile methodology. DSDM focus to reach the main goal of a project timely. By taking review, testing the system and documented it very well DSDM helps to provide a high qualified project (airfocus, 2020) and focus on the changes of requirements to deliver a successful project. Collaboration of DSDM team members are fruitful for the project.

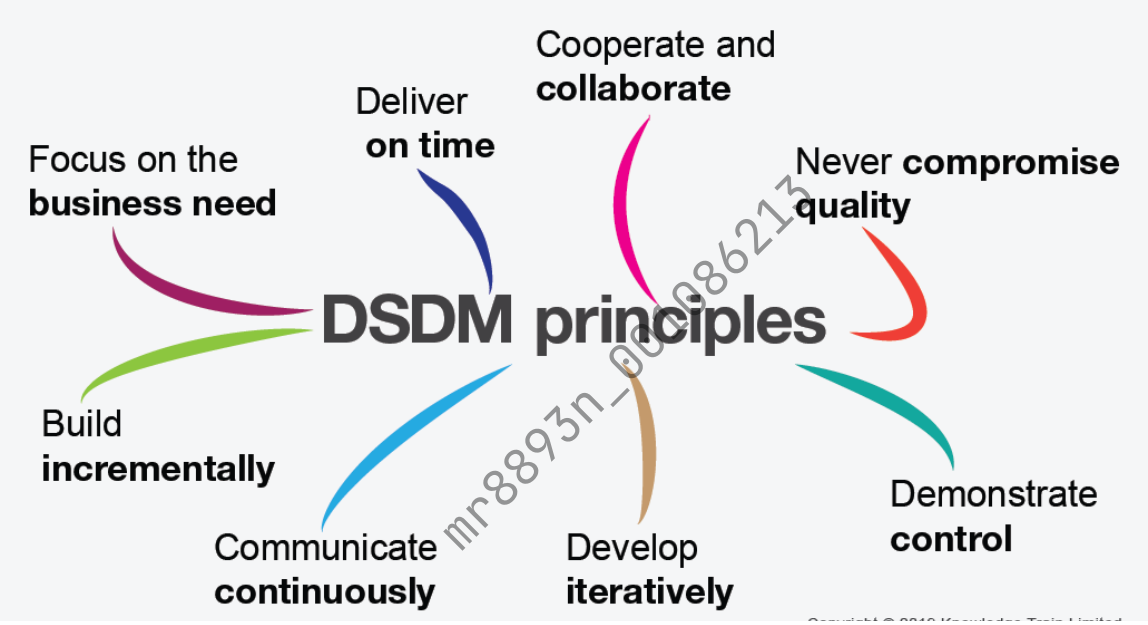


Figure 5: DSDM Methodology (Buehring, 2020)

Advantages of DSDM methodology

- Ensure that the project deliver **on time** and with a **favorable budget**.
- Supports user involvement.
- It is a faster approach to deliver the **main functionality** of a project.
- Through developers end user can access. (viblo.asia, 2020)

Disadvantage of DSDM methodology

- DSDM is not effective for small organization.

- It is hard to understand as it is recent method from another.
- DSDM can be hard to the developer without maintaining its principles.

5.2.4 RAD methodology

RAD is also an agile methodology which is for prototyping an application to test the function of the system quickly. RAD provide a qualified system within short time and developer can do iteration to improve the system quickly. It identifies the requirements and then prototype the functionality to take feedback and finally developers deliver a software by finalizing the usability in a short time. (kissflow, 2020)

Advantages of RAD methodology

- RAD facilitated to take customer feedback.
- System can be done in a short time.
- Developers are free from the worry about changing requirements if it is needed.
- Requirements can change at any time.

Disadvantage of RAD methodology

- Only expert developer needs for this method.
- Comparing with other method it is more **difficult to manage**.
- Without strong **collaboration** in team it is hard to lead the development process effectively.

5.3 Recommendation with justification

When a project needs to be completed at a certain time, the most suitable method for that project would be the DSDM Atern methodology. For a time-bound project, the recommended methodology is the **DSDM methodology**. I have chosen DSDM atern methodology for my proposed system, because my project is an academic project. Academic projects are always given a specific time to finish. To complete my project in time and on my affordable budget DSDM is the most suitable method.

Since my proposed system is an academic project and I have to develop particular number of features, DSDM will be the easiest method for me to follow for a successful development. Because DSDM divides the whole developing process in some time box. Each time box contains 2-4 weeks to provide a useful deliverable which is enough for me to develop a functionality effectively. And this time box will help me a lot to develop my whole system in time and maintain the quality. There are two options for making time box in DSDM method one is **A DSDM Structured Time Box** another one is **A Free Format Time Box**. I have chosen a time box for my project because it provides a standard and iterative time box. Along this there is another justify reason to choose DSDM atern methodology, which is the **Eight Principles of DSDM**. Without following these principles by the developers, it is impossible to meet the final outcome. The eight principles of DSDM are following:

1. Focus on the business need
2. Deliver on time
3. Collaborate
4. Never compromise quality
5. Build incrementally from firm foundations

6. Develop iteratively
7. Communicate continuously and clearly
8. Demonstrate control. (Boog, 2020)

Justification for choosing DSDM

DSDM has some tools and techniques which is efficient for a developing process. Because it is an academic project so there is a limited time to complete the whole development. DSDM is beneficial to maintain all the requirements and deliver the project on time with favorable budget. DSDM also makes a strong relation and provide involvement of the user in development cycle, which is useful for changing requirements or update requirements through user feedback and provide a qualified system and maintain the system efficiently (Jackson, 2014).

Techniques of project development in DSDM

DSDM has eight principles to follow by the developer which is need to meet a successful project. Besides these principles, DSDM has some techniques that are also very useful for the success of a project. Some major techniques are **Timeboxing, MoscoW Rules, Facilitated Workshop** (Sharma, 2019) and these techniques are described below:

Timeboxing

DSDM uses timeboxing to acquiring the final goals of a project. Each timebox contains 2-4 or mostly 6 weeks to complete required task.

- Changing of requirements in timebox during development is effective to reach business needs quickly.
- At the end of the week of a timebox the final outcome of the product will deliver.
- Requirements can identify efficiently through planning of timebox.

- Requirements can change iteratively in timebox while the developing process are running.
- Timebox can afford more than one task, and helps to complete the proposed task effectively.

Moscow prioritization

Moscow prioritization is basically about the consideration of requirements. Requirements of a project can be changed by the user as the user can involve in the project during development. So, the requirements need to be specific to develop. And for the weighting of the requirements Moscow rules can apply by the developers. And these rules are following:

Must Have: All the requirements which must be implemented for the system, else the system will not work and it will be a useless system.

Should Have: All these requirements which are necessary but can be leave if the time are less and the system will still workable without these requirements.

Could Have: Requirements for Improving the functionality of a system, but without these requirements system will able use.

Won't Have: These requirements are not mandatory or valuable for the system, or can implement in future.

Facilitated Workshop

The last important techniques of DSDM is facilitated workshop, through this workshop user and stakeholders along with the developer can discuss about the system, requirements, and by taking user feedback change the requirements if it is required. Through the workshop an organization can identify their core requirements and improve the functionality of the project. To clarify the

business goals a workshop is required when the process is running of developing a system. User feedback, changing requirement iteratively, collaboration between user and stakeholders are important to achieve the final goals, which is possible through a workshop. DSDM allows facilitated workshop where decision making will be quickly and correctly which is essential for ensuring a high-quality outcome.

5.4 Requirements gathering techniques/tools with justification

Properly gathering requirements is a very important part for a project to be successful, it is essential to understand the requirements of the user what is needed. While using DSDM atren methodology for development then it is required to gather and understand the requirements which is need for the project and which requirements is effective for the project. To understand and clarify the requirements in an efficient way there are some techniques to adopt and these techniques are describing below:

- **Brainstorming**: To get more ideas about a requirements brainstorming are done. Refining the idea and get the solution of a problem brainstorming are used.
- **Focus Group**: Group of some people who are representative of the customer or user, they are gather together to provide feedback. And the feedback can take business needs, identify requirement, changes requirements or identify the problem on the system.
- **Analyzing Document**: Analyzing different previous document can be an essential technique to get more ideas and collect more information about a project. While analyzing different document there is a possibility to find out some effective functions and identify useful requirements.
- **Interview**: Without knowing the requirements of the user and stakeholder it is not possible to satisfy them with the system, interview of user and stakeholder can help to knowing

about the requirements which are needed by the user. Interview will be helpful to collect the important requirement.

- **Observation**: Observation on user is an effective way by an analyst to gather the requirements and identify a process. And it is a great opportunity to improve the system by gather more information about system from the user.
- **Questionnaire**: collecting information from different people can be a way to gather more information and requirements. Questionnaire helps to collect information by forcing a user to answer a question. (tutorialspoint, 2020)

5.5 Technical tools with justification

Gathering requirement can be tough without having proper technical tools. Technical tools need to follow to manage gathered requirements. Technical tools will help to gather requirements easily and some of these tools are given below:

- **Use case diagram**: Use case diagram helps to think out the relationship between user and system. Use case diagram provides the idea of user action and system response. Use case diagrams are used to explain the effects of a system inside and outside.
- **Sequence diagram**: Sequence diagram indicates the interaction between objects. Developer of a system mostly use this diagram to show how the various parts of a system related with each other for completing a function.
- **Wireframes**: Wireframes can be use by the developer to defining how the system are works. Wireframes also helps to identify the mistakes in the design. (creately, 2020)

- **ERD diagram (with UML notation):** ERD diagram is for understanding the relation between entities through the database. ERD diagram use different notation describing the relation between entities, attributes of a database.
- **IDE**: Php Storm.
- **Font End**: HTML5, CSS3, JavaScript, jQuery
- **Database**: MySQL.

6 Planning

6.1 Project Plan

6.1.1 Management Plan/Work Breakdown Structure

Smart Poultry Village

Smart Poultry Village	85 days	Sat 07/25/20	Sat 10/31/20
Initial Project Study	**15 days**	**Sat 07/25/20**	**Mon 08/10/20**
Project Proposal	2 days	Sat 07/25/20	Sun 07/26/20
Faciliated Workshop	1 day	Mon 07/27/20	Mon 07/27/20
Initial Study	1 day	Tue 07/28/20	Tue 07/28/20
Faciliated Workshop	1 day	Wed 07/29/20	Wed 07/29/20
Report	0 days	Wed 07/29/20	Wed 07/29/20
Literature Review	6 days	Thu 07/30/20	Wed 08/05/20
Faciliated Workshop	1 day	Thu 08/06/20	Thu 08/06/20
Report	0 days	Thu 08/06/20	Thu 08/06/20
Choosing Methodology	2 days	Fri 08/07/20	Sat 08/08/20
Faciliated Workshop	1 day	Sun 08/09/20	Sun 08/09/20
Report	0 days	Sun 08/09/20	Sun 08/09/20

Figure 6: Initial Project Study of Project development

Planning	20 days	Mon 08/10/20	Tue 09/01/20
Project Plan	2 days	Mon 08/10/20	Tue 08/11/20
Faciliated Workshop	1 day	Wed 08/12/20	Wed 08/12/20
Report	0 days	Wed 08/12/20	Wed 08/12/20
Test Plan	2 days	Thu 08/13/20	Sat 08/15/20
Faciliated Workshop	1 day	Sun 08/16/20	Sun 08/16/20
Report	0 days	Sun 08/16/20	Sun 08/16/20
Risk Management Plan	2 days	Mon 08/17/20	Tue 08/18/20
Faciliated Workshop	1 day	Wed 08/19/20	Wed 08/19/20
Report	0 days	Wed 08/19/20	Wed 08/19/20
Quality Management Plan	2 days	Thu 08/20/20	Sat 08/22/20
Faciliated Workshop	1 day	Sun 08/23/20	Sun 08/23/20
Report	0 days	Sun 08/23/20	Sun 08/23/20
Change Management Plan	1 day	Mon 08/24/20	Mon 08/24/20
Faciliated Workshop	1 day	Tue 08/25/20	Tue 08/25/20
Report	0 days	Tue 08/25/20	Tue 08/25/20
Feasibility Study	2 days	Wed 08/26/20	Thu 08/27/20
Faciliated Workshop	1 day	Sat 08/29/20	Sat 08/29/20
Report	0 days	Sat 08/29/20	Sat 08/29/20
Requirement analysis and gathering	2 days	Sun 08/30/20	Mon 08/31/20
Faciliated Workshop	1 day	Tue 09/01/20	Tue 09/01/20

Figure 7: Planning phase of project development

System Design & Architecture	**5 days**	**Wed 09/02/20**	**Mon 09/07/20**
Use Case Diagram	1 day	Wed 09/02/20	Wed 09/02/20
Faciliated Workshop	0 days	Wed 09/02/20	Wed 09/02/20
Report	0 days	Wed 09/02/20	Wed 09/02/20
Entity Relationship Diagram	1 day	Thu 09/03/20	Thu 09/03/20
Faciliated Workshop	0 days	Thu 09/03/20	Thu 09/03/20
Report	0 days	Thu 09/03/20	Thu 09/03/20
Class Diagram	1 day	Sat 09/05/20	Sat 09/05/20
Faciliated Workshop	0 days	Sat 09/05/20	Sat 09/05/20
Report	0 days	Sat 09/05/20	Sat 09/05/20
Sequence Diagram	1 day	Sun 09/06/20	Sun 09/06/20
Faciliated Workshop	0 days	Sun 09/06/20	Sun 09/06/20
Report	0 days	Sun 09/06/20	Sun 09/06/20
Component Diagram	1 day	Mon 09/07/20	Mon 09/07/20
Faciliated Workshop	0 days	Mon 09/07/20	Mon 09/07/20
Report	1 day	Mon 09/07/20	Mon 09/07/20

Figure 8: System design and architecture phase of the developing project

Development	**35 days**	**Tue 09/08/20**	**Sun 10/18/20**
New System Feature	3 days	Tue 09/08/20	Thu 09/10/20
Timeboxing breakdown for features	2 days	Sat 09/12/20	Sun 09/13/20
Faciliated Workshop	1 day	Mon 09/14/20	Mon 09/14/20
Report	0 days	Mon 09/14/20	Mon 09/14/20
Exceptional Handiling	2 days	Tue 09/15/20	Wed 09/16/20
Iteration	20 days	Thu 09/17/20	Sat 10/10/20
Testing	7 days	Sun 10/11/20	Sun 10/18/20
Test Execution	4 days	Sun 10/11/20	Wed 10/14/20
Faciliated Workshop	1 day	Thu 10/15/20	Thu 10/15/20
Report	0 days	Thu 10/15/20	Thu 10/15/20
Exceptional Handiling	2 days	Sat 10/17/20	Sun 10/18/20

Figure 9: Development phase of project development.

Deployement	**5 days**	**Mon 10/19/20**	**Sat 10/24/20**
Planning	1 day	Mon 10/19/20	Mon 10/19/20
Implementation	1 day	Tue 10/20/20	Tue 10/20/20
Report	1 day	Wed 10/21/20	Wed 10/21/20
Faciliated Workshop	1 day	Thu 10/22/20	Thu 10/22/20
Report	0 days	Thu 10/22/20	Thu 10/22/20
Exceptional Handiling	1 day	Sat 10/24/20	Sat 10/24/20

Figure 10: Deployment phase of project development.

Evaluation	**3 days**	**Sun 10/25/20**	**Tue 10/27/20**
Product Evalution	1 day	Sun 10/25/20	Sun 10/25/20
Faciliated Workshop	0 days	Sun 10/25/20	Sun 10/25/20
Report	0 days	Sun 10/25/20	Sun 10/25/20
Critical Appraisal	1 day	Mon 10/26/20	Mon 10/26/20
Lesson Learned	1 day	Tue 10/27/20	Tue 10/27/20

Figure 11: Evaluation phase of project development.

Closing	**3 days**	**Wed 10/28/20**	**Sat 10/31/20**
Project Summery	2 days	Wed 10/28/20	Thu 10/29/20
Future Development	1 day	Sat 10/31/20	Sat 10/31/20

Figure 12: Closing phase of project development.

6.1.2 Resource Allocation

Resource allocation is a process of assigning resources for achieving the goal of project by specific role of project development team. This allocation process is done by the developing team of the project. As this project is following DSDM methodology and in DSDM there are some specific roles for a developing team. In DSDM there are Business Analyst, Solution Developer, Solution Tester, End-user. These roles have some specific task to collect resource and use them for the project. All the resource allocation for each role with time limitation are given below:

No of Task	Task	Time Duration(days)	Role
	Smart Poultry Village Project	85 day (Approx.)	Business Analyst, Solution Developer, Solution Tester

01	Introduction	2	Business Analyst
02	Literature Review	5	Business Analyst
03	Product Research	3	Business Analyst
04	Legal, social, professional, ethical issues consideration	2	Business Analyst
05	Methods and Tools for development	2	Business Analyst, Solution Developer
06	Planning	4	Business Analyst, End-user
07	Feasibility Study	2	Business Analyst, Solution Developer
08	Analysis and Specification of requirements	5	Business Analyst
09	Architecture and system design of new system	5	Solution Developer, End-user
10	Technology Review	3	Solution Tester, End-user

11	Development	29	Business Analyst, Solution Developer
12	Testing	6	Solution Tester, End-user, Solution Developer
13	Deployment	5	Solution Developer, End-user
14	Evaluation	2	Business Analyst
15	Critical Appraisal	3	Business Analyst
16	Learned Lessons	1	Solution Tester, End-user, Solution Developer
17	Conclusion	2	Business Analyst
18	Reference	1	Business Analyst
19	Appendix	2	Business Analyst
20	Figures List	1	Business Analyst

6.1.3 Time Allocation/Timebox

Timebox is allocation time for the specific task. In DSDM methodology all the task executed using timebox. And a timebox time limit may be maximum two – four weeks. Each timebox delivers one or more deliverables for the project. As this project is developing in DSDM all the task will be

break down and each break down work will be put in the time box. This will help to track all the developing process of the project and the efficiency of the project will increase. For this project there is Approx. 85 days for development. Whole developing process will be breaking down and that work will be assigned in the time box with specific time limit. That allocation of work with time limit are given below:

Time Box No	Tasks	Duration(days)	DSDM team role
01	Introduction	2	Business Analyst
	Literature Review	5	Business Analyst
	Product Research	3	Business Analyst
02	Consideration of LESP issues	2	Business Analyst
	Methods and Tools for development	2	Business Analyst, Solution Developer
	Planning	4	Business Analyst, End-user
03	Feasibility Study	2	Business Analyst, Solution Developer

	Analysis and Specification of requirements	5	Business Analyst
	Architecture and system design of new system	5	Solution Developer, End-user
4	Technology Review	3	Solution Tester, End-user
	Development	9	Business Analyst, Solution Developer
5	Development	12	Business Analyst, Solution Developer
6	Development	8	Business Analyst, Solution Developer
	Testing	4	Solution Tester, End-user, Solution Developer
7	Testing	2	Solution Tester, End-user, Solution Developer

	Deployment	5	Solution Developer, End-user
	Evaluation	2	Business Analyst
	Critical Appraisal	3	Business Analyst
8	Learned Lessons	1	Solution Tester, End-user, Solution Developer
	Conclusion	2	Business Analyst
	Reference	1	Business Analyst
	Appendix	2	Business Analyst
	Figures List	1	Business Analyst

6.1.4 Activity Network

Activity network for Smart Poultry Village are given below:

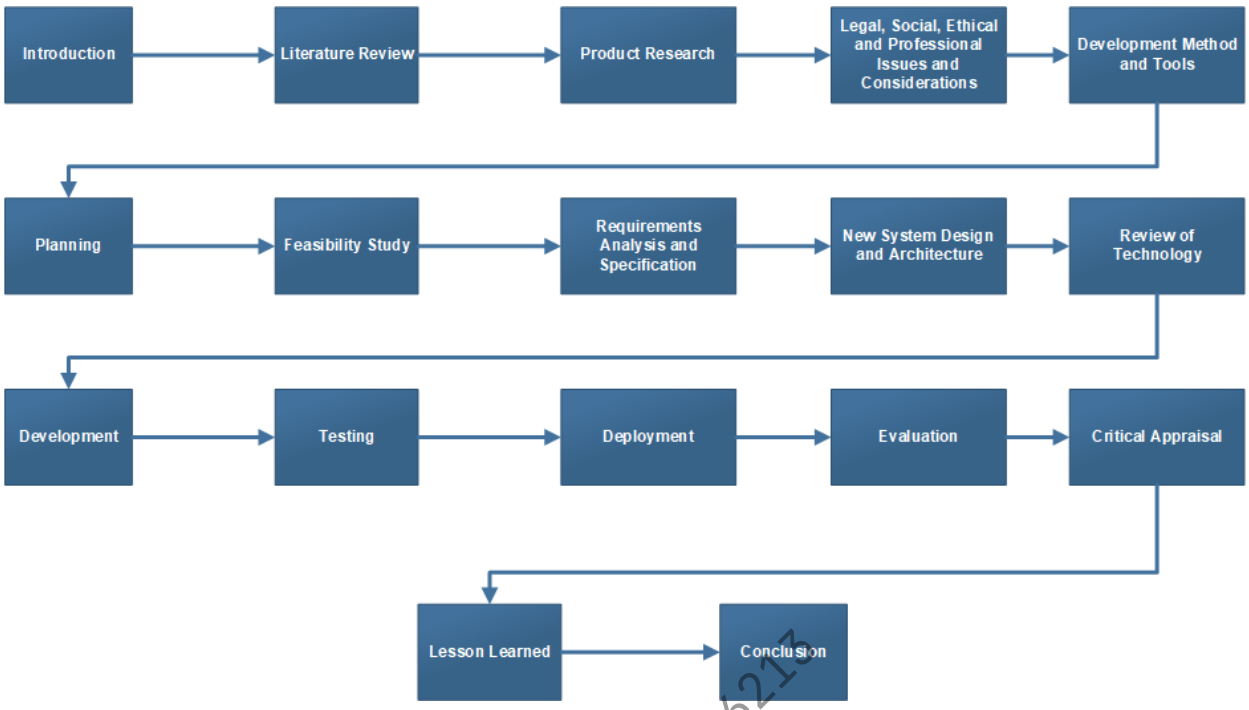


Figure 13: Activity Network of the project.

6.1.5 Critical Path

Critical path of the developing project is shown below by highlighting in red color:

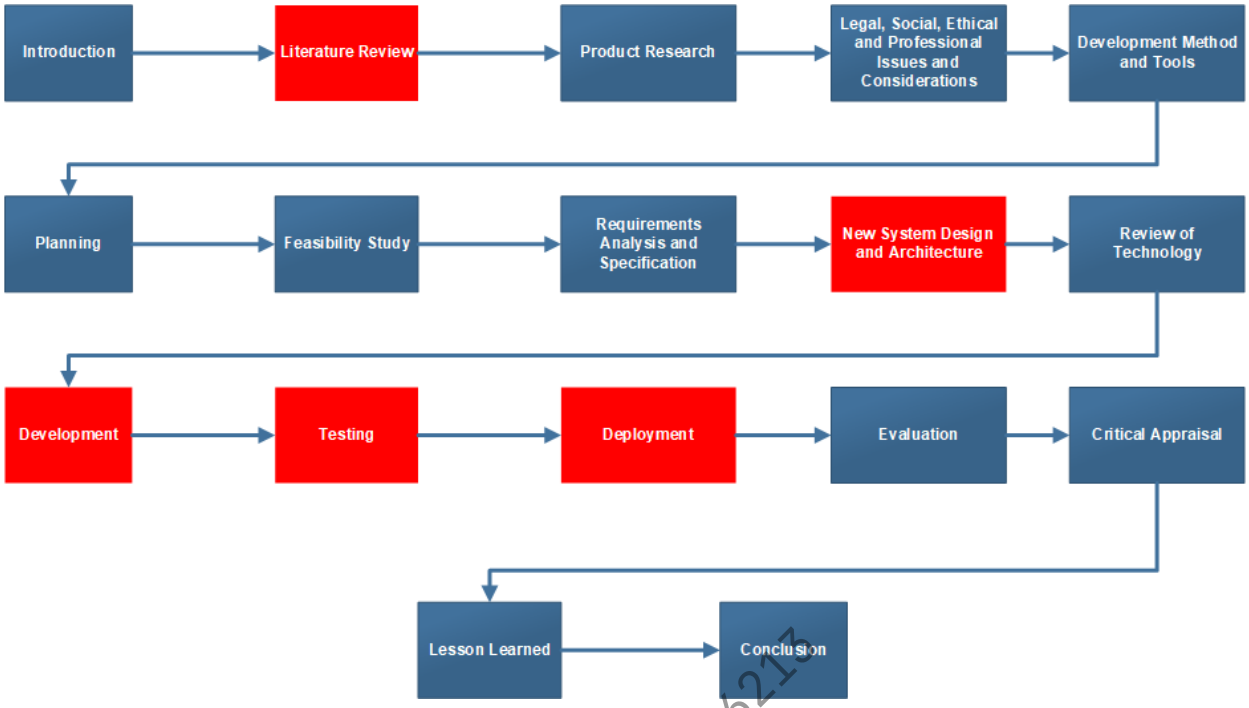
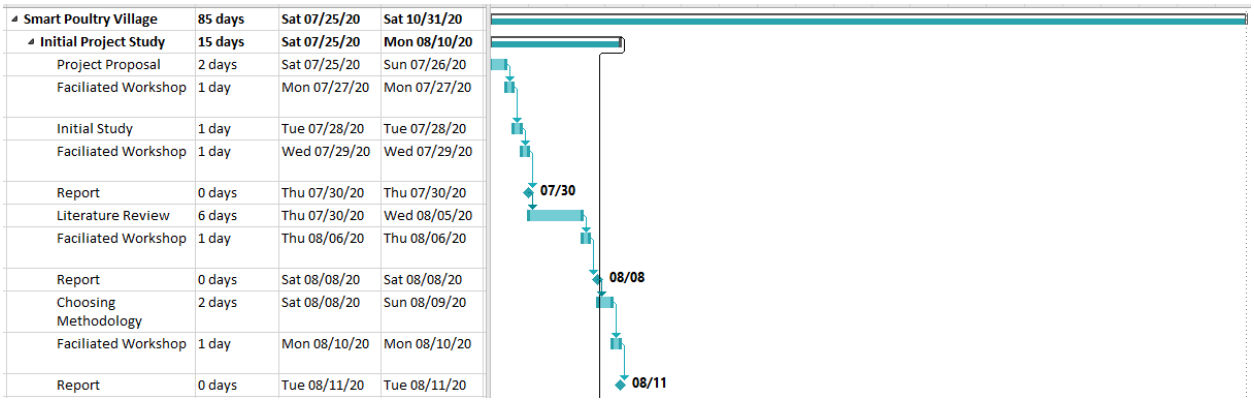


Figure 14: Critical path of the project.

6.1.6 Gantt Chart

Gantt chart of the project are shown below:



Smart Poultry Village	85 days	Sat 07/25/20	Sat 10/31/20
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Project Proposal	2 days	Sat 07/25/20	Sun 07/26/20
Faciliated Workshop	1 day	Mon 07/27/20	Mon 07/27/20
Initial Study	1 day	Tue 07/28/20	Tue 07/28/20
Faciliated Workshop	1 day	Wed 07/29/20	Wed 07/29/20
Report	0 days	Thu 07/30/20	Thu 07/30/20
Literature Review	6 days	Thu 07/30/20	Wed 08/05/20
Faciliated Workshop	1 day	Thu 08/06/20	Thu 08/06/20
Report	0 days	Sat 08/08/20	Sat 08/08/20
Choosing Methodology	2 days	Sat 08/08/20	Sun 08/09/20
Faciliated Workshop	1 day	Mon 08/10/20	Mon 08/10/20
Report	0 days	Tue 08/11/20	Tue 08/11/20

Figure 15: Gantt Chart of Initial project study of project

Planning	**20 days**	**Mon 08/10/20**	**Tue 09/01/20**
Project Plan	2 days	Mon 08/10/20	Tue 08/11/20
Faciliated Workshop	1 day	Wed 08/12/20	Wed 08/12/20
Report	0 days	Thu 08/13/20	Thu 08/13/20
Test Plan	2 days	Thu 08/13/20	Sat 08/15/20
Faciliated Workshop	1 day	Sun 08/16/20	Sun 08/16/20
Report	0 days	Mon 08/17/20	Mon 08/17/20
Risk Management Plan	2 days	Mon 08/17/20	Tue 08/18/20
Faciliated Workshop	1 day	Wed 08/19/20	Wed 08/19/20
Report	0 days	Thu 08/20/20	Thu 08/20/20
Quality Management Plan	2 days	Thu 08/20/20	Sat 08/22/20
Faciliated Workshop	1 day	Sun 08/23/20	Sun 08/23/20
Report	0 days	Mon 08/24/20	Mon 08/24/20
Change Management Plan	1 day	Mon 08/24/20	Mon 08/24/20
Faciliated Workshop	1 day	Tue 08/25/20	Tue 08/25/20
Report	0 days	Wed 08/26/20	Wed 08/26/20
Feasibility Study	2 days	Wed 08/26/20	Thu 08/27/20
Faciliated Workshop	1 day	Sat 08/29/20	Sat 08/29/20
Report	0 days	Sun 08/30/20	Sun 08/30/20
Requirement analysis and gathering	2 days	Wed 09/02/20	Thu 09/03/20
Faciliated Workshop	1 day	Sat 09/05/20	Sat 09/05/20
Report	0 days	Sun 09/06/20	Sun 09/06/20

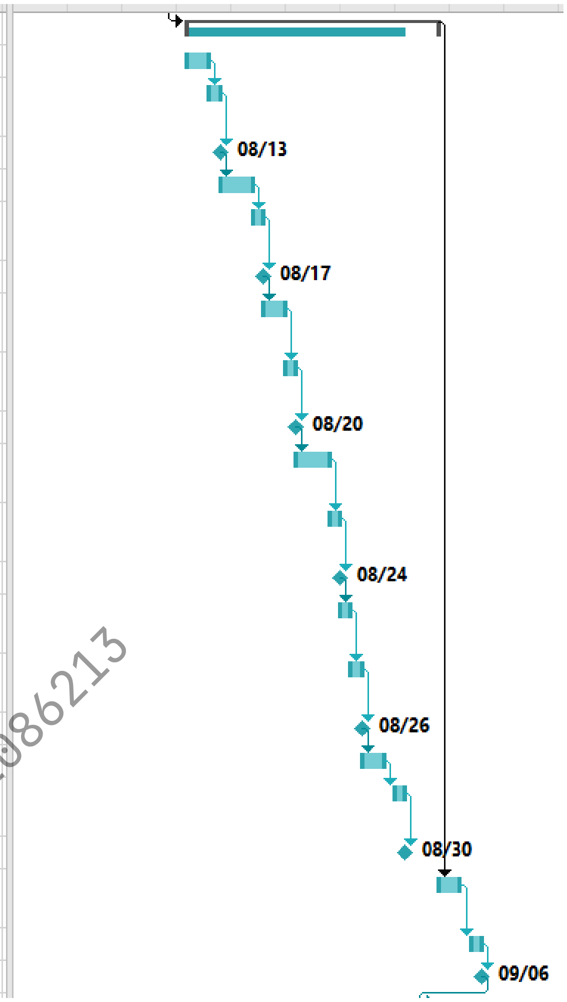


Figure 16: Gantt Chart of planning of the project.

System Design & Architecture	**5 days**	**Wed 09/02/20**	**Mon 09/07/20**
Use Case Diagram	1 day	Wed 09/02/20	Wed 09/02/20
Faciliated Workshop	0 days	Thu 09/03/20	Thu 09/03/20
Report	0 days	Thu 09/03/20	Thu 09/03/20
Entity Relationship Diagram	1 day	Thu 09/03/20	Thu 09/03/20
Faciliated Workshop	0 days	Sat 09/05/20	Sat 09/05/20
Report	0 days	Sat 09/05/20	Sat 09/05/20
Class Diagram	1 day	Sat 09/05/20	Sat 09/05/20
Faciliated Workshop	0 days	Sun 09/06/20	Sun 09/06/20
Report	0 days	Sun 09/06/20	Sun 09/06/20
Sequence Diagram	1 day	Sun 09/06/20	Sun 09/06/20
Faciliated Workshop	0 days	Mon 09/07/20	Mon 09/07/20
Report	0 days	Mon 09/07/20	Mon 09/07/20
Component Diagram	1 day	Mon 09/07/20	Mon 09/07/20
Faciliated Workshop	0 days	Tue 09/08/20	Tue 09/08/20
Report	1 day	Tue 09/08/20	Tue 09/08/20

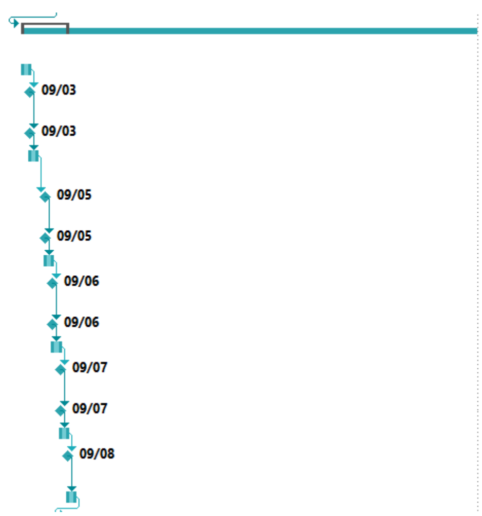


Figure 17: Gantt chart of System design phase of project.

Development	35 days	Tue 09/08/20	Sun 10/18/20
New System Feature	3 days	Tue 09/08/20	Thu 09/10/20
Timeboxing breakdown for features	2 days	Sat 09/12/20	Sun 09/13/20
Faciliated Workshop	1 day	Mon 09/14/20	Mon 09/14/20
Report	0 days	Tue 09/15/20	Tue 09/15/20
Exceptional Handiling	2 days	Tue 09/15/20	Wed 09/16/20
Iteration	20 days	Thu 09/17/20	Sat 10/10/20
Testing	7 days	Sun 10/11/20	Sun 10/18/20
Test Execution	4 days	Mon 10/19/20	Thu 10/22/20
Faciliated Workshop	1 day	Sat 10/24/20	Sat 10/24/20
Report	0 days	Sun 10/25/20	Sun 10/25/20
Exceptional Handiling	2 days	Sun 10/25/20	Mon 10/26/20

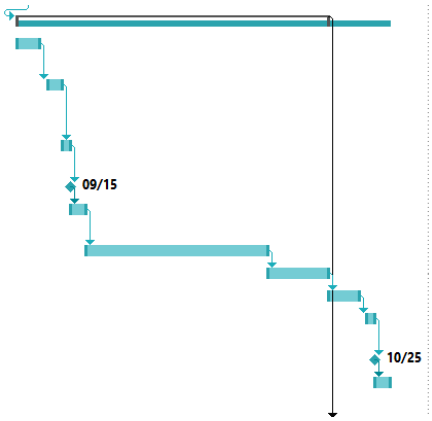


Figure 18: Gantt chart of development phase of project

Deployement	5 days	Mon 10/19/20	Sat 10/24/20
Planning	1 day	Mon 10/19/20	Mon 10/19/20
Implementation	1 day	Tue 10/20/20	Tue 10/20/20
Report	1 day	Wed 10/21/20	Wed 10/21/20
Faciliated Workshop	1 day	Thu 10/22/20	Thu 10/22/20
Report	0 days	Sat 10/24/20	Sat 10/24/20
Exceptional Handiling	1 day	Sat 10/24/20	Sat 10/24/20

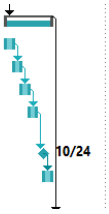


Figure 19: Gantt chart of deployment phase of project.

Evaluation	3 days	Sun 10/25/20	Tue 10/27/20
Product Evalution	1 day	Sun 10/25/20	Sun 10/25/20
Faciliated Workshop	0 days	Mon 10/26/20	Mon 10/26/20
Report	0 days	Mon 10/26/20	Mon 10/26/20
Critical Appraisal	1 day	Mon 10/26/20	Mon 10/26/20
Lesson Learned	1 day	Tue 10/27/20	Tue 10/27/20

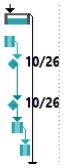


Figure 20: Gantt chart of evaluation phase of the project.

Closing	3 days	Wed 10/28/20	Sat 10/31/20
Project Summery	2 days	Wed 10/28/20	Thu 10/29/20
Future Development	1 day	Sat 10/31/20	Sat 10/31/20

Figure 21: Gantt chart of closing phase of the project.

6.2 Test Plan

Test plan is a way to maintain the process of how the code will be tested after completing the system. To assuring the functionality of the implemented requirements there need to be

documented a test plan. Test plan are important for identifying the test methods of the system. Test plan hold the planning of testing and testing helps to prevent the risk of failure of the project. All the final result needs to be tested during SDLC for an efficient project, test plan documented all the methods of required testing. Test plan is significant for ensuring the quality and the functionality by testing of a system. (betabreakers, 2015)

6.2.1 Required Tests

For testing, a test plan is necessary as well as some tests are required for testing the functionality of the system during SDLC. There are two types of testing process in SDLC Functional **Testing** (Unit testing, integration testing, system testing, end to end testing, exploratory testing, acceptance testing) and **Non-Functional** (Security testing, performance testing, compatibility testing, load testing, usability testing) testing (Doshi, 2019). Some required testing from these testing processes are following:

Unit Testing: To test the written code developers use unit testing. It is mainly use for test a particular function which has a single outcome. In unit testing all the functionality tested gradually by the developers.

Integration Testing: Integration testing assure that all the individual unit of codes can work connectively. Integration testing can test by the developers or tester. When codes written by more than one developer then integration testing apply to test the code.

Usability Testing: Usability testing is means for how easy it will be to use by the users. It will assure the ease of the functionality. Usability testing are required for reducing the complexity of the system.

Security Testing: Security testing are most required test for a project to validate the security of a system, this testing is for ensuring only validate user will able to use and restricted for unauthorize user.

Performance Testing: performance testing is required to testing the performance of the functionality, how smoothly the system can work can tested by performance testing. And to ensure that all the requirements meet the final outcome which was expected.

Acceptance Testing: Acceptance testing is a set of tests where it will be tested all the requirement are done and work effectively. And it will be acceptable by the user. After completing the system and tested the system functionality through all the required testing acceptance test will apply.

6.2.2 Testing against Timeboxing

For the proposed system DSDM methodology has chosen. One of the core reasons of using DSDM methodology for developing the system is timeboxing. DSDM method grant time boxing for developing a project within time and in budget. The process of time boxing is divided the whole project into several time boxes. Each time box is bounded in time to develop a function and testing. Each time box contains 2-4 weeks for developing and mostly 6 weeks but not more than that. Once a feature completed then it needs to be tested. And after testing the functionality of the features it can be change or update if it requires. This can be done incrementally. And while it ensures that all functionality is working effectively of the developed features then another timebox will start. To do all the process efficiently 2-4 weeks is enough to develop an effective feature. Time boxing are connective with Moscow prioritization to develop the important function at first and deliver the project in time. Time boxing helps the developer to produce a successful project (Hendry, 2020). And through time boxing functionality can be tested during the development cycle

by taking feedbacks and changing requirements. Possible risk can identified beforehand develop the next feature and deliver the project, which is very significant for providing a qualified project.

User Name			
No of Time Box			
Task of time Box			
Type of the Test	Action	Expected Result	Actual Result

6.2.3 What need to be tested?

Testing is essential part of software development. Testing is carried out for assessing the system is working correctly or not. Beside system is providing service what it means to give. And it also finds the bugs and error in the system. So, in the developed system for assessing every code is working or not there will be executing unit testing. For assessing all the feature is working there will be executed integration testing. For testing the compatibility in different screen compatibility testing will be carried out. For assessing the navigation usability testing will be carried out. And after carried out all testing a successful system will be developed which will fulfills its goals and objectives.

6.3 Risk Management Plan

Risk Management Plan in a project is a document which tells how to deal with specific risk and action plan for removing or mitigating that risk from the project activities or outcome. (mymanagementguide, 2020) In every project any kind of risk may arise. And that risk may take the project to be unsuccessful. Risk management plan helps to identify any risk that may occur during the development of project and it helps to take necessary action plan to minimize the risk. Without Risk Management plan a project goal cannot be achieved. Risk Management plan helps to achieve project goal by identifying the risk and providing plan to minimize or overcome the risk.

Figure 22: Risk Management Plan cycle. (Stupple, 2020)

6.3.1 Risk Identification

Risk identification is a process of identifying risk that may prevents the project to achieve its objectives during the development process of any project. (MITRE, 2020) In this section the possible risk that may arise during the development of this system need to be identified. Some of the risk are identified for the system and discussed below

Scheduling Risk

- Time of the project development is not estimated properly than it will produce schedule risk for the project.

- Expansion of project scope can produce schedule risk in the project. (Help, 2020)
- Unable to identify complex functionalities of the system and this will take much time from the estimated time to be developed.

Budget Risk

- Expansion of project scope will increase the budget cost.
- Budget estimation not properly done can rise budget risk.
- Cost overruns due to lack of budget estimation planning will produce budget risk. (Help, 2020)

Operational Risk

- When fail to do proper prioritization of project features. Than it will arise operational risk of the project. By developing a low priority feature instead of developing the main feature.
- If there are insufficient recourses for development of the project that operation of project development will be failed. (Help, 2020)
- Team member of the developing team can fall sick. This can cause operational risk.

Technical Risk

- Unlimited changes in the requirements of the system will arise technical risk in the project. If in the system new requirements added one after one than it will cause technical risk. (Help, 2020)
- Recourse for the development can be damaged. Like hard drive can get crashed and damaged due to short circuit and get attacked by different virus or malware, trojan attack.

External Risk

- External risk is risk that arise outside of the organization and internal team. Like Changes of government and different type of legislative issues in the country can arise external risk.
- Different types of natural disaster can arise external risk to the development. Like tornado, earth quake or flood which can damage the organization and arise external risk.
- Continues load shedding and interrupted internet connection can arise external risk in the development of project.
- Different types of pandemic cause external risk in the development process. Like 2020 Corona Virus pandemic shuts down the entire world.

6.3.2 Risk Assessment

The process in which risk for the project are identified, analyzed and prioritized according to the risk that is called Risk Assessment. (Rouse, 2020) Here all the risk that cause project failure are identified. And identified hazard is analyzed and evaluated and then these hazards will be assessed by risk assessment process. In this section the identified risk from the previous section will be assessed. For assessing some criteria have identified that are **Impact of risk**, **Livelihood of risk** and **Frequency of risk.** Details of the criteria are given below:

Impact of Risk: Impact of identified risk will be assessed by High, Medium and Low

Possibility of Risk: Livelihood of risk will be assessed by

Nearly Definite – very nearly sure,

Possibly - Perhaps,

Improbably - Unexpected,

Infrequent - Rare.

Frequency of Risk:

Identified Risk	Risk Details	Possibility of Risk	Impact of Risk	Frequency of Risk
Scheduling Risk	Time of the project development is not estimated properly than it will produce schedule risk for the project.	Nearly Definite	High	0-5
	Expansion of project scope can produce schedule risk in the project.	Possibly	High	0-2
	Unable to identify complex functionalities of the system and this will take much time	Improbably	Medium	1-2

	from the estimated time to be developed.			
Budget Risk	Expansion of project scope will increase the budget cost.	Possibly	High	0-2
	Budget estimation not properly done can rise budget risk.	Nearly Definite	High	0-1
	Cost overruns due to lack of budget estimation planning will produce budget risk.	Possibly	Medium	1-2
Operational Risk	When fail to do proper prioritization of project features. Than it will arise operational risk of the project. By developing a low priority feature instead of developing the main feature.	Improbably	High	0-1
	If there are insufficient recourses for development of	Infrequent	High	0-5

	the project that operation of project development will be failed.			
	Team member of the developing team can fall sick. This can cause operational risk.	Infrequent	Medium	1-2
Technical Risk	Unlimited changes in the requirements of the system will arise technical risk in the project. If in the system new requirements added one after one than it will cause technical risk.	Possibly	High	0-1
	Recourse for the development can be damaged. Like hard drive can get crashed and damaged due to short circuit and get attacked by different virus or malware, trojan attack.	Improbably	High	5-10
External Risk	External risk is risk that arise outside of the organization and internal team. Like	Infrequent	Low	20-30

	Changes of government and different type of legislative issues in the country can arise external risk.			
	Different types of natural disaster can arise external risk to the development. Like tornado, earth quake or flood which can damage the organization and arise external risk. Continues load shedding and interrupted internet connection can arise external risk in the development of project.	Improbably	High	5-6
	Continues load shedding and interrupted internet connection can arise external risk in the development of project.	Possibly	Low	10-15
	Different types of pandemic cause external risk in the development process. Like	Infrequent	Medium	10-20

	2020 Corona Virus pandemic shuts down the entire world.			

6.3.3 Risk Action Plan

After identification and assessing the risk of the project. Here comes the risk action plan phase. The action plan of the risk will help to overcome the possible risk that will arise during the development of the project. All the action plans of the risk are given below against identified and assessed risk.

Identified Risk	Risk Details	Possibility of Risk	Impact of Risk	Action Plan for Risk
Scheduling Risk	Time of the project development is not estimated properly than it will produce schedule risk for the project.	Nearly Definite	High	A proper time estimation will be done before starting the development of the project.
	Expansion of project scope can produce schedule risk in the project.	Possibly	High	Before starting development of the project, the requirements of the

				project need to be justified.
	Unable to identify complex functionalities of the system and this will take much time from the estimated time to be developed.	Improbably	Medium	Before development start all the functionalities should be discussed clearly to identify the complexity of the functions.
Budget Risk	Expansion of project scope will increase the budget cost.	Possibly	High	Organization need to make a budget for the project considering the possibilities of expanding project scope.
	Budget estimation not properly done can rise budget risk.	Nearly Definite	High	A proper budget should be made by analyzing the market and requirements before starting the

				development phase.
	Cost overruns due to lack of budget estimation planning will produce budget risk.	Possibly	Medium	Budget estimation should be done in a proper way that is does not overruns the estimated budget.
Operational Risk	When fail to do proper prioritization of project features. Than it will arise operational risk of the project. By developing a low priority feature instead of developing the main feature.	Improbably	High	After analyzing the requirements, a proper prioritization of the project feature need to made.
	If there are insufficient recourses for development of the project that operation of project development will be failed.	Infrequent	High	All the sufficient resources should be managed by the organization before starting project development.
	Team member of the developing team can fall sick.	Infrequent	Medium	Development team should be hard working and there

	This can cause operational risk.			should be back up team member for continuing the development of the project. And medical assistance should be ensuring for the developer teams' members by the organization.
Technical Risk	Unlimited changes in the requirements of the system will arise technical risk in the project. If in the system new requirements added one after one than it will cause technical risk.	Possibly	High	Requirements should be justified before starting development of the project.
	Recourse for the development can be damaged. Like hard drive can get crashed and damaged due to short circuit and get attacked by different virus or malware, trojan attack.	Improbably	High	Use of antivirus and scheduling scan should be done to prevent different malware attack and trojan attack. Use of generator and ups

				can prevent short circuit.
External Risk	External risk is risk that arise outside of the organization and internal team. Like Changes of government and different type of legislative issues in the country can arise external risk.	Infrequent	Low	All the legislative issues for the project development should be known by the development team so that legislative issue cannot arise risk in the development.
	Different types of natural disaster can arise external risk to the development. Like tornado, earth quake or flood which can damage the organization and arise external risk.	Improbably	High	For facing any kind of natural disaster everybody of the development team should be always prepared and organization need to take proper steps to face natural disaster.

	Continues load shedding and interrupted internet connection can arise external risk in the development of project.	Possibly	Low	All the electricity and internet line should be checked before starting development of the project. And need to ensure proper flow of electricity and proper speed of internet by the organization for the development team.
	Different types of pandemic cause external risk in the development process. Like 2020 Corona Virus pandemic shuts down the entire world.	Infrequent	Medium	Development team should have the mentality of work from home.

6.4 Change Management Plan

Change management plan is steps that an organization need to take to execute change management process. (Izquierdo, 2020) Change of the project are required when there needs an improvement in the performance of the project. And Change management plan helps to manage all the process of change management. And change management helps to adopt the changes for the organization. In the phase of project development changes occurs frequently according to the

needs of requirements and for fulfilling business goals. And this Change Management Plan helps to manage this change process. For the development of the project DSDM methodology have chosen and DSDM facilities changes in the development phase. And making a successful change in the project development phase change management plan is required.

6.4.1 Factors that might cause change

Changes occur in the software development stage is a common factor. For developing a successful project for any person or organization changes might be occur for different factors. And these factors are like

I. Business Goal.

II. Business Process.

III. Requirements Change.

IV. Recourse Change.

V. Technology Upgrade.

VI. Change in solutions.

These factors might be the reason for the changes in the project for an organization or person. And if the changes factors are not analyzed and managed properly than it will hamper the work of development process. So proper planning and analyzing should be done for the change factors for ensure successful change in the project.

6.4.2 Considering Business Value

The benefits that an organization generates for its stakeholders is Business Value. (Spacey, 2018) A product for an organization is developed for increasing its business value. And for increasing the business value for the organization the requirements of organization need to filled

while developing the project. The development methodology of this project is DSDM. DSDM facilities changes during the project development phase. DSDM uses time box or sprint in the development process to develop feature for the project. Each time box or sprint have confined amount of time for one or more deliverable feature of the project. And this feature of the project is tested individually by the user. And user provides feedback after using the feature of the project. If user is not satisfied with the feature any changes need to be made than this change will be added to the development process for adding in the feature with time box or sprint. Like this the requirements that need to added to the feature of the project for organization that will increase business value that will be added during the development phase. And this change will be made in development after a discussion in a facilitated workshop.

6.4.3 Change Workshop

DSDM allows facilitated workshop where stakeholder, developer and user participate and discussed about the project requirements, changes and developed features. In facilitated workshop everybody individually can share their views and opinion in particular requirement or changes requirement. Facilitated workshop improve and enhance the communication with in the team and stake holders. After identifying the changes by user or organization's requirements a facilitated workshop will to be conducted for doing the change. Everybody will share their opinion on the required change and a final decision will be taken for making the change.

6.4.4 Changes that are allowed

The changes that are identified by user feedback or organization's need all are not allowed to change. All changes not enter into the development process again. The changes which will be allowed are measured with some criteria that criteria are project scope, budget, time, resources and risks. All the changes that are identified all the not allow to change because one single change makes a huge impact in development phase.

Changes are allowed in a project are discussed below:

Project Scope: According to the change of organization business goal project scope can be change.

Resource Collection. For the change of requirements or change in feature resources need to be collected or need to change. Than collecting new recourse or change in recourse are allowed.

Time Budget: If the major requirements of the project are not developed in allocated time then the time limit can be increase or change.

Budget: If the changes do not cross excess limit of budget that it is allowed to change the budget in moderate amount.

Risk: All the risk factor must be considered for allowing new changes in the project.

6.4.5 Key Decision Takers of change

After finalizing all the allowed changes in the software development process, it does not enter to the development phase for adding the change to the system. A change for the system makes a great impact. For that reason, all the allowed changes need to be managed by anybody from the development team of the system. All members are not responsible for adding the change in DSDM. There are some key members who will be responsible and they will be the key decision makers for changes will be approved or not. And those key decision takers in DSDM methodology are

Team Leader: Team leader mange the solution team of the developing system. (RENDER, 2019) Any changes from the stakeholders or from user feedback all changes are managed by the team leader by discussing business value with the stakeholder and risk and scheduling with the solution developer.

Solution Developer: Solution developer who receive the change that are required for the system. Analyze the changes, finds its complexity and check the time budget against the changes need to make. (RENDER, 2019) Than give decision is it possible to add the change to the system or not.

Solution Tester and End User: The whole system features will be tested individually by them. (RENDER, 2019) If any kind of changes required for any feature of the system, they will provide decision for adding that changes to the system or not.

6.5 Quality Management Plan

6.5.1 Rules Applied to maintain quality

A set of information or documentation which is used to manage the quality of the project throughout the project development process from planning to deployment is called Quality Management Plan for project. The main purpose of Quality Management Plan is to deliver an adequate quality product which fulfills the purpose of developing the product. (guru99, 2020) Quality Management helps to increase efficiency in the project development reducing waste. Helps to improve risk management and increase customer satisfaction. There are some components of Quality Management Plan to achieve quality for the project and these are

I. Quality Assurance.

II. Quality Control.

III. Quality Improvement.

Quality Assurance: Quality Assurance is ensuring the quality of the product features. (guru99, 2020) All the requirement feature will have a goal to ensure the quality of the feature. In this phase it will be assure that all the requirement feature is able to meets it goal or not.

Quality Control: Quality Control is the process of developing the system which could meet the quality goal for that feature. By identifying the defects and improve the defects can ensure the quality control of the product feature.

Quality Improvement: In this phase the developed feature should be assessed against review points. (guru99, 2020) And possible improvement should be done for the assessed feature of the project.

6.5.2 Quality Plan and Measuring meter

Quality plan is identifying quality standards and requirements which will need to be fulfilled by the deliverables feature of the project and designing a plan how to fulfill these requirements by the deliverables feature. (knowledgehut, 2020) For measuring meter is like some questionaries' or evaluation criteria which will help to assure the system quality. For that reason, there are questionaries' or evaluation criteria for measuring the quality of the developed system.

a. Are the business goal of the organization meets with the system?
b. Does system work efficiently?
c. Does feedback collect for all the feature of the system from end user?
d. Does user accept and find easy to use the system?
e. Is the system being secure?
f. Does all the DSDM rules follow by the developing team?

7. Feasibility study

The project related factors like economic, technical, legal, etc. are analyzed in order to determine the possibility of completing the project successfully. This analysis is known as feasibility study (KENTON, 2020). Feasibility study is used to consider the advantage and disadvantage of

undertaking a project. Therefore, it can be understood whether the investment of time and money in the project is worthwhile. Besides, it is also used to detect obstacles that may obstruct its operation and can identify the funding amount it will require to get the business up and running (Simplilearn, 2020). There are various types of feasibility studies. Among of these, some are discussed down,

7.1 Technical feasibility

The available technical resources of the organization are focused on this part. It describes whether the technical resources meet capacity. Besides, the capability of converting the ideas into working systems is also determined here. The evaluation of the hardware, software, and the other technical requirements of the undertaking project are also involved in the technical feasibility (Indeed, 2020).

7.2 Operational feasibility

It focuses on the facts like whether the developed and implemented system will be used and whether there will be interruption from client that will affect the upcoming project conveniences. Therefore, it can be said that it analyzes and destines whether and how well the needs of organization can be met by accomplishing the project. It also explains whether the project plan meets the requirements defined in the requirements analysis. Hence, it can be said that operational feasibility is based on facts like manager support, required training, workforce reduction, and effects to users and customers (Askinglot, 2020).

7.3 Economic feasibility

Here, the analysis of cost/benefit of project is involved. Before, allocating the financial resources, this part helps to determine the viability, charge, advantages related to the project. It is also an independent project evaluation that helps in decision making through determining the positive

economic benefits that the undertaking project will provide. So, it can be said that this increases the project credibility (Simplilearn, 2020).

7.3.1 Required hardware and software cost

I am going to develop and implement the project on my own as this is an academic project. Now, I am going to provide the description of some required hardware and software that are going to be used during this time.

Hardware

- Monitor – LG IPS 22MK600
- Processor – Ryzen 5 3600
- SSD – 240 GB
- HDD – 1 TB
- Motherboard – MSI B450 APRO MAX
- RAM – 8 GB
- Power Supply – Corsair 450w
- Casing – Onada X21
- Graphics Card – 1660 oc
- Keyboard – A4 Tech
- Mouse – A4 Tech
- Router – TP-Link TL-WR841N

Software

- Operating system – Windows 10
- Office – Microsoft Office 2019
- Xampp 3.2.4
- IDE – PhpStorm 2019.3.3

Hardware cost

Hardware	**Quantity**	**Cost (BDT)**
Monitor	1	10,100
Processor	1	17,400
SSD	1	3,200
HDD	1	3,200
Motherboard	1	6,300
RAM	1	3,600
Power Supply	1	2,700
Casing	1	2,200
Graphics Card	1	17,100
Keyboard	1	510
Mouse	1	400

Router	1	1,550
Total		BDT 68,260

Software cost

Software	**Cost**
Windows 10	13,450
Microsoft Office 2019	13,450
Xampp	Free
PhpStorm 2019.3.3	Free
Total	BDT 26,700

7.3.2 Host cost

In order to launch the project in the web, we require the host and domain. Else the project will be obsoleted. Here, the details about the host and domain that are going to be used in the project are provided below,

	Host	**Domain**
Name	Plan 8	.com
Rent	7000 BDT/year	950 BDT/year
Total cost	7950 BDT/year (BD, 2020)	

7.3.3 Additional cost

There is some additional cost that also needs to be considered during economic feasibility assessment. Here are some details about the additional cost,

Sector of cost	**Time**	**Cost BDT/month**	**Total (BDT)**
Electricity cost	4 months	2,000	8,000
Internet	4 months	1,000	4,000
	Total	BDT 12,000	

7.3.4 Possible earns calculation (Benefit)

The main goal of this project is to manage the poultry farm. To manage a poultry farm, some factors are required to manage. Such as, managing chicken, its medicine, food, transportation etc. there are also severe factors that needs to be managed like customers, staff etc. Moreover, extra expenses also should be taken into account. Besides, a report providing all the regarded calculation should be generated. The expected system will have all the functions that are just discussed above. Now, all the functions could be earning source separately. If any farm owner wants the system due to managing the poultry farm, he needs to purchase the system. The breakdown of the purchasing amount following each of the functions are given below,

Function	**Expense (BDT)**
Managing chicken inventory and vend	40,000
Managing chicken medicine	10,000

Managing chicken food	10,000
Managing transportation	10,000
Managing customers	20,000
Managing stuff	20,000
Managing extra expenses	10,000
Report generation	30,000
Total	BDT 1,50,000

7.3.5 Cost Net Analysis

See **Appendix – B.**

7.4 Analyze the major organizational changes with new system

Changes always have impact on the subject where it made. Like this change in organization also have a great impact. Deploying new system to an organization will also bring changes in the environment of the organization and its business process. But make sure everybody accepts the system for the organization. Implementing a system in the organization is not easy. It may arise lots of issues. Implementation new system can have both negative and positive impact in the organization. Negative impact like not accepting or finds it difficult to use new system who are satisfied with existing system. Positive impact of new system is like increase the growth of business. Reduce manual task and automate work of the staff. Increase profit of the business. So, some organizational changes that will take place in organization after implementing new system are discussed below:

7.4.1 Change in business structure

Deploying new system to the organization will make change in business structure. Change in business structure is reorganizing departments, revising employee roles, adding employee in new position. (opentextbc, 2020) In poultry farm organization implementation of new system will bring some changes in the business structure of the poultry farm. All the hand-written task to manage the farm will be reduced by inputting the data in the system. Storing data to the paper will be store in database. And generating report of farm information will be automated using the new system. All the work structure of farm owner and staff will be changed.

7.4.2 Change in working procedure

After changes in the business structure the changes will happen in working procedure of the organization. At first there will need time to adopt with the new working procedure of the deployed system. In the poultry farm working procedure will change. All the manual work will be digitalized and automated. Works of storing data manually will be change to digitalization of inputting data in the system. Farm owner and working staff will store the data related to farm and chicken management in database instead of paper. And hand-written report work will be done by automated report generation by the system. And this new system will change working procedure beside it will reduce working load and working time of the organization people.

7.4.3 Change in business policy

Business policy of an organization is set of rules defined by owner of organization to maintain the organization and to maintain working standards. (Leonard, 2018) Deploying new system in the organization there will be change in business policy. As changes happens in the working

procedure then the policy of the organization will be updated or will be change. In poultry farm implementing new system the performance of the organization will increase. For maintaining standard policy of organization will be changed. There will arise new issues in poultry farm for the implementation of new system to deal with new issues there will be change in the business policy of the poultry farm.

7.4.4 Change in staff attitude

Deploying new system in the organization there will be impact on the staff attitude. And impact will be positive or negative. In poultry farm after deploying the system there will also seen the impact of change in the staff. Some impact will be negative and some will be positive. Positive impact will be staff will find less work load and work can be done easily. They could do more work in short time. And negative impact will be the staff who are satisfied and comfortable the with the existing system that staff will find the system irrelevant and that staff will find it difficult to use the system.

7.5 SWOT Analysis

SWOT analysis is a technique of assessing strength, weakness, opportunities and threats of the system. (mindtools, 2020) The SWOT analysis of the system are given below:

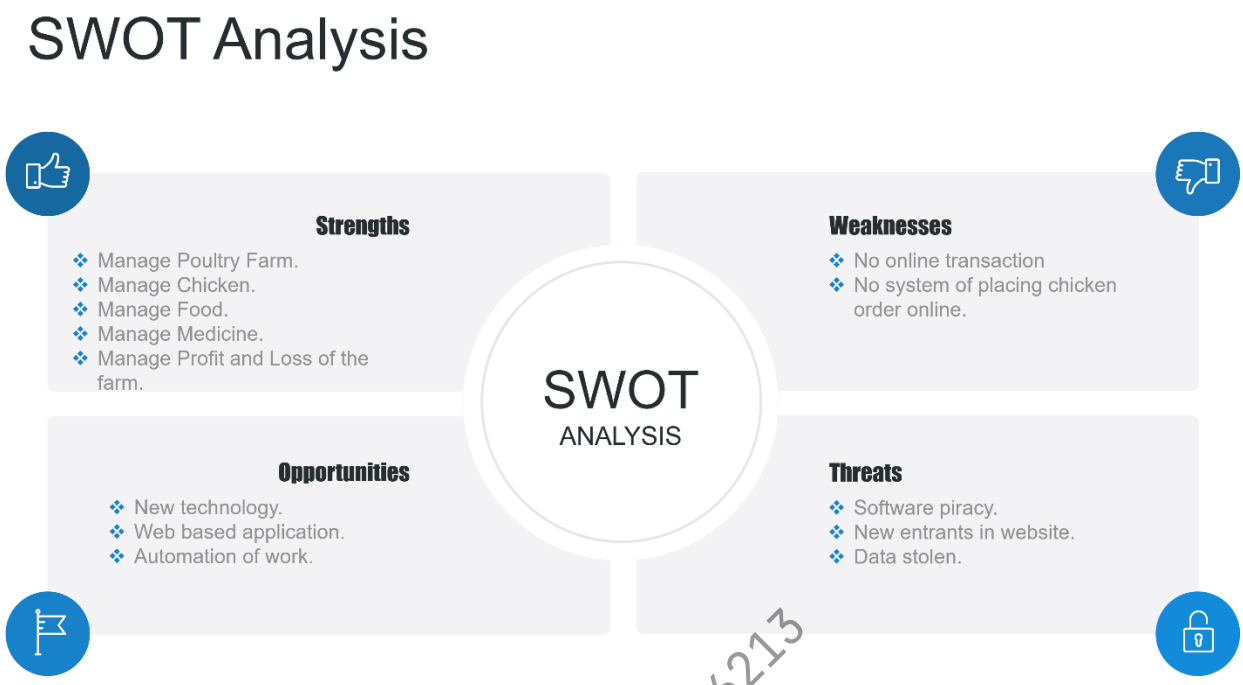


Figure 23: SWOT analysis for developing project.

8. Requirement analysis and specification

Starting the development process for a project there need to analyze all the requirements and helps to identify all the requirements for the developing project. It also helps in identifying project goals. Beside functional and Non-functional requirement of the project system also identified in from requirement analysis.

8.1 Rich Picture

8.1.1 Diagram

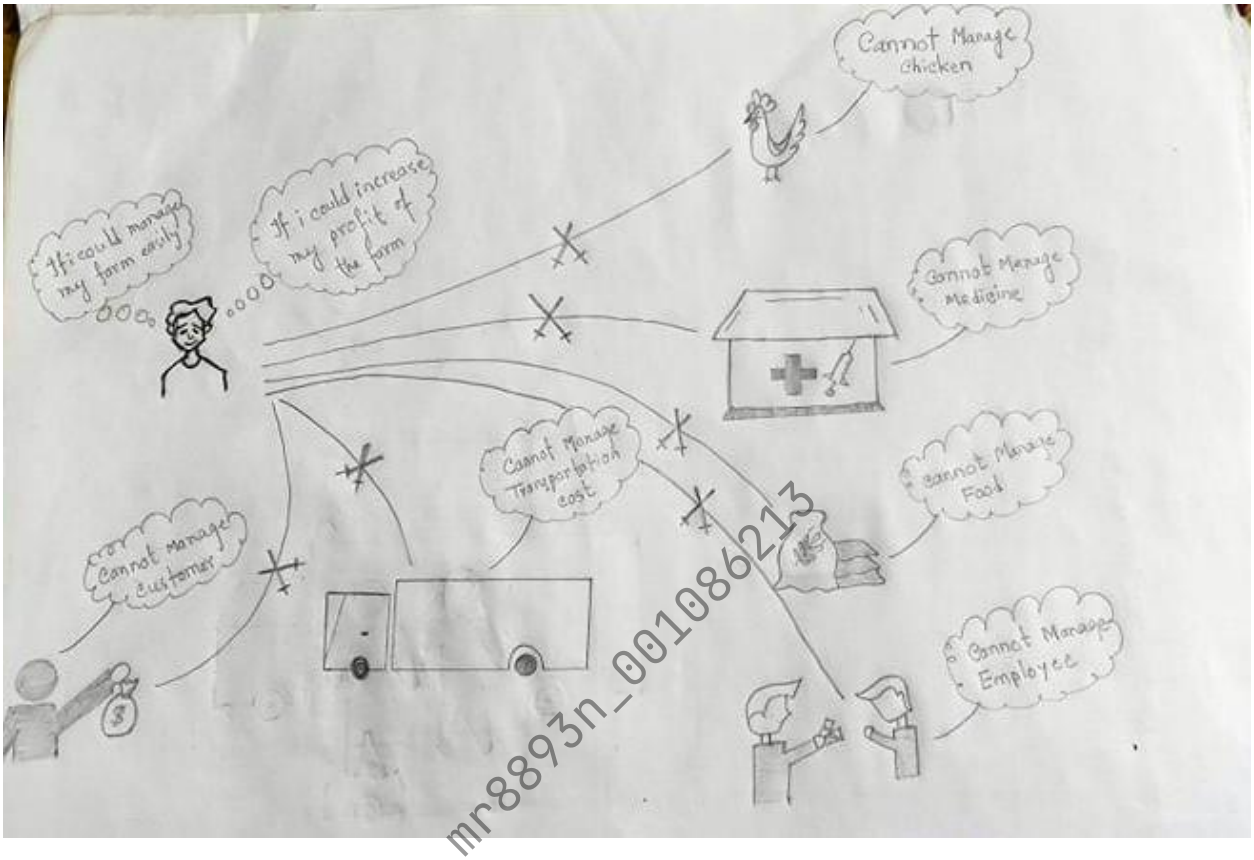


Figure 24: Rich Picture of present condition of poultry farm.

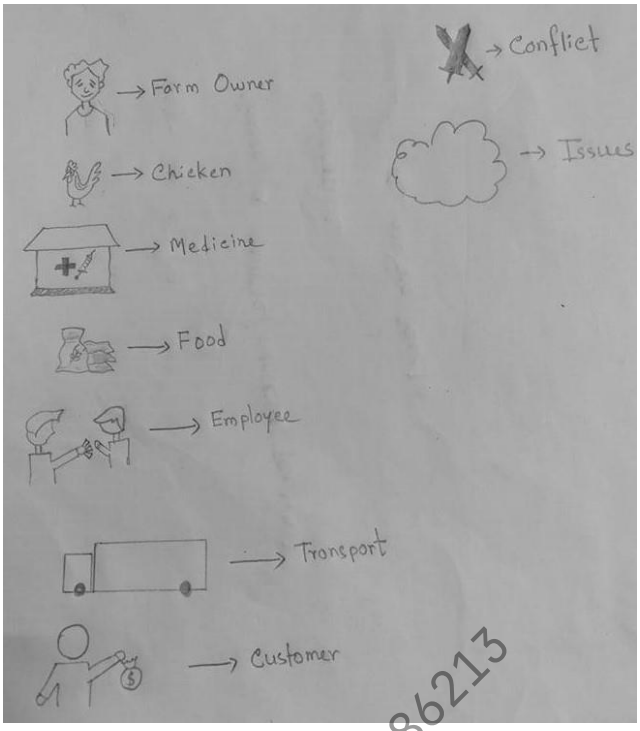


Figure 25: Legends of Rich picture.

8.1.2 Description

This diagram shows current working and managing process of the poultry farm. Here shows all the working process of farm owner to manage the farm. In the diagram it shows that user cannot manage the farm. Farm owner cannot make much profit due to unable of managing farm. One sector cannot be properly managed. And farm owner thinking for a way to manage the farm easily. In the diagram all the conflicts that takes place are also identified. Rich picture shows the current working process of the farm and conflicted areas of a poultry farm.

8.1.3 Key issues

The current system of managing farm is traditional way. All the works of managing farm is manual. And for this there arise some issues those issues are discussed below:

- User track down all the purchase and sale of chicken in paper. And this can be lost or damaged

- User track all food and medicine purchase for the chicken in paper. And there is chance of losing and damaging of the paper.
- User track all the given food and medicine for the chicken. Here tracking done using paper which have a chance of losing and damage.
- User manage customer, employee salary and other expenses by writing information in the paper sheet which also have a chance of losing and damaging.
- User track the transportation cost of chicken using paper which may also lost and damaged.
- User cannot generate much profit for not storing much data of the farm. And it is difficult to gather all the paper store data and calculate them to find out profit and loss. Where some important stored data may lose.

8.1.4 Areas of conflict

In the farm there are some conflicted areas which will be discussed below.

- User stored all data of purchase and sale of chicken in paper. This is manual process. These conflicts can be reduced by storing data in digital way to a secure database.
- User stored all data of purchase and food and medicine of chicken in paper. This is manual process of storing data. Data may get lost. These conflicts can be reduced by storing data in a database by digital way.
- User stored all data of given food and medicine of chicken in paper. This is manual process need consume more time and there is possibility of losing the data. These conflicts can be prevented by providing inventory management system.
- User manage customer, employee salary and other expenses and transportation cost of chicken by writing information in the paper sheet this will make hard to find required

information about customer and specific expenses of the farm. which also have a chance of losing and damaging. This can be solved by managing data digitally.

- User cannot generate report for the profit and loss of the farm by collecting all paper stored data. This conflict can be solved by auto generating report function.

8.2 Organizational Structure

Organizational structure is a system in which the system outlines how definite activities are directed to achieve the goals of an organization. Rules, roles and responsibilities are the activities. Organization structure also describe how information flows in different levels of the organization. (KENTON, 2020) Poultry farm is an organization. In poultry farm organizational structure will be built by applying some rules and carrying out some responsibilities for the farm by specific role holder.

8.3 Project Stakeholder

Project stakeholders are people or group of people who will gain or lose something from the outcome of the project. According to Project Management Institute Project Stakeholders are Individuals and organizations who actively involved in the project or their participation may be positively or negatively affects the result of project and it may affect project execution and successful project completion. (teamwork, 2020) The person who will be beneficial with the development of this system are the stakeholders of this project. And for this project there will be multiple stakeholder they are discussed below:

Chief Executive Officer/Owner: Owner or Chief Executive Officer is the main and most important stakeholder of a project. CEO or Owner will have no direct involvement in the project

development. Their Impact are the most in the project development. CEO or Owner decides, supports and rest of the stakeholder are also chosen by CEO or Owner.

Investor: After CEO Or Owner investor plays a vital role in the project development process. All the money spend for the development will be invested by investor. So, all financial decision approves after discussion with the Investor.

Project Manager: Project manager is the most important stake holder in a project development process. Project Manager manages the developing team and collaborates with the upper stakeholder. He works as a medium get requirements from the customer and make understand the team what need develop and manage the team during development. And responsible for final product after development.

End User or System User: System user also stakeholder because they are the reason for developing the system. They will use the system for their needs. They will give feedback after using the system. They will provide feedback for the improvement of the system.

8.4 User Requirements

User Requirements is description of business needs which will be provided by the system to the user or stakeholder. (ofnisystems, 2020) And user requirements need to be collected properly for developing a successful system for user or stakeholder. And these requirements are mainly collected before the development of the system starts. There is some technique for requirement gathering. Among them some of the technique will be followed for developing this system. That technique names are given below:

a. Interview.

b. Survey or Questionnaires.

c. Document Analysis.

d. Observation and Experience.

Interview

Interview is the first technique for collecting requirement. Interviewing user and stakeholders helps to make a successful system for them. Interviewing user and stakeholders the goal and expectation will be known. If we don't know the goal and expectations of user and stakeholders than we will unable to satisfy them with the developed software. So, all stakeholders of the project will be interviewed to gather requirements for the system and to know their expectation from the system. So, some question will be asked to each stakeholder to know collect requirement and information. Full description of interview and its question will be given in **Appendix – C**.

8.4.1 Summary of interview

After taking interview of all the stakeholder for the system some key issues come out. And those key issues will be considered as the business goal of the stakeholders and requirement information of the system. All the stakeholders answer all the question asked to them. System owner wants a system that provides automation of managing poultry farm easily. The problems identified from the answers of stakeholders are Farm owner finds difficult to track chicken inventory, food inventory, medicine inventory and chicken mortality of the farm in manual writing in the index. Owner also added that he cannot track down the food given to the chicken and medicine given to the chicken. Owner finds difficult to write all the information of food, medicine and other cost for each batch of the chicken. All the data of farm is hard to store in paper. It is impossible to generate a report for each batch chicken and difficult to generate dynamic reports with the cost and income of the farm to be shown by writing manually.

8.4.2 Survey or Questionnaires

Survey and questionnaires are another medium of collecting information from stakeholders. When it is necessary to take information or opinion of many people than survey or questionnaires are

used. Because budget and time will need more for conducting individual interview. So, survey is best choice for taking information from many people. In survey user will be able to select from multiple choice and give rating (agree, strongly agree). (tutorialspoint, 2020) And for questionnaires W/H question may asked. In my project I Surveyed and questioned many poultry farm owner and it helps me to understand the primary goal of the system. It helps to find important requirement of the system. And also help to prioritize that requirements.

8.4.3 Document Analysis

Requirement information can gather by analyzing different documentation of existing solution related to the system. This another technique of data gathering. By analyzing the existing documentation, gap of the existing system can be identified and that can add in the developing system. Existing system gap requirements can be filled up by making questionnaires to the stakeholders. Document analysis help in creating questionnaires. Document analysis can find out limitation of existing system and solution for the limitation will be develop in developing system. This documentation analysis technique for requirements gathering have done in the **Literature Review** section of this documentation.

8.4.4 Observation and Experience

Observation is observing the user business process physically. This technique helps to understand the process, steps, difficulty points and provide opportunities to improve. (tutorialspoint, 2020) Observation is two type one is active another is passive. Passive observation is asking user in the time of observation. And active observation is understanding the system process itself. From passive observation the requirement of the system can refined and by active observation existing business process can be understand. For my project I have visited few farms. I have used active and passive observation while visiting the farm. I have understood that it is difficult to record the data of farm manually is so tough. Farm owner finds very difficult to

store data of chicken, food and medicine manually using pen and paper. Owner unable to find chicken batch wise data which batch makes how much money and spends how much money. Which batch consumed how much food and medicine. Producing Income and expense report for multiple batch of chicken and for Farm is very difficult for farm owner. So, farm owners have answered that if any system could develop to automate all these task and store necessary data of chicken, medicine and food of the farm to be stored easily in one place that will help farm owner a lot. They think if any system can develop to solve the above problems than this will help them to make more profit in their business.

8.5 Specific problem area identification and description

Poultry farm rears up huge amount of chicken. Per batch there are 500-5000 chicken rears up in small farm. In big farm this amounts gets double or triple. For a farm owner it is impossible to maintain and track down the data of these chicken manually. And there is other task like giving food, medicine to the chicken. All need to manage for the profit of farm. For a farm owner it is impossible to manage all these events manually. For that reason, several problems arise. Analyzing these problems area some specific problem can be identified. And for this specific problem possible solution will be developed by the system. So, now some specific problem areas regarding managing farm will be discussed below:

Poor Data Input Method: All the data related to buying chicken, food, medicine, transportation cost related to chicken are done manually using pen and paper. This data is very much important for calculating the profit and loss of the farm. But it is difficult to manage all this data and store in paper by writing. And it will take huge time for doing this.

Poor Data Management: Data related to farm all are written in the paper. It is very difficult to manage all the data of the farm like chicken, food, medicine, transportation and customer by

writing manually to the paper. Sometimes any data written paper can be lost. Written data stores to the paper can be wrong. And this works also takes huge time to do manually.

Hand Written Report Generation: After completing storing data for each chicken batch, food given, medicine given and transportation cost for chicken manually. It is impossible to make hand written report for each chicken batch by giving information of which chicken batch consumed how much food, medicine and how much chicken got sale and how much chicken died. And lastly generating report of each batch profit and loss is also impossible. And it happens manually it will take vast time to generate. And there will be possibilities of making mistakes.

8.6 Possible Solutions

Every problem has solution or have a way to reduce the problem. The identified problem from the above section will be provided some possible solution so that this will reduce or give solution to the problem. The possible solution has discussed below:

Develop Web Application:

A web application will be developed where farm owner will give input of the data of chicken, food, medicine, transportation and customer of the farm. This application will save all the data to a server. This will remove the hassle of storing data on a paper.

Database Creation:

For storing all the data input of the owner, a database will be created. Where all the stored data will be saved in a secure and organized way. Creation of database will prevent data from data redundancy and data losing.

Dynamic Report Generation:

Using the stored data of database all kind of report can be easily produced. Dynamic report will be generated for specific items like chicken, food, medicine and transportation cost. Each batch

income, cost and consumption report also be generated easily and automatically. By this report user will able to identify the condition of profit and loss of the farm.

8.7 System Requirements from different personnel perspective

System requirements from the perspective of user are discussed below.

Users

- Want to register and login to the system to manage his/her farm.
- Need a dashboard.
- Can manage chicken purchase details.
- Can manage chicken sales details.
- Can manage food purchase details.
- Can manage medicine purchase details.
- Can manage transportation cost.
- Can manage customer details.
- Can manage other expenses of the farm.
- Can manage food given of chicken.
- Can manage medicine given of chicken.
- Can generate chicken inventory report.
- Can generate chicken mortality report.
- Can generate food inventory report.
- Can generate medicine inventory report.

- Can generate chicken batch wise costing and income report.

8.8 Requirements List with Specification

To develop a successful system or project we need fulfill all the requirements that are gathered to meet the business goal of the stake holders. Here applying some data gathering technique major requirements for the system are identified. And these requirements are two types. One is functional requirements and another in Non-functional requirements. Functional and Non-functional requirements of developing system are given below:

8.8.1 Functional Requirements

Functional requirements of the system.

- User able to register to the system.
- User able to login to the system.
- User able to insert chicken purchase data.
- User able to insert chicken sales data.
- User able to input chicken mortality data.
- User able to insert food purchase data of chicken.
- User able to insert medicine purchase data of chicken.
- User able to insert transportation cost data of chicken.
- User able to insert customer details.
- User able to insert other expenses data of farm.

- User able to check chicken inventory.
- User able to check food inventory.
- User able to check medicine inventory.
- User able to generate batch wise report of chicken.

8.8.2 Non-functional requirements

Non-Functional requirements of the system.

- System should provide user friendly interface.
- Data stored in the system should be protected.
- Data Integrity should be provided by the system.
- System performance should be robust.
- System should be maintained easily.

8.9 Prioritized Requirement List

After collecting all the requirements now prioritization of the requirements need to be done. Because all requirements will not get same prioritization while developing the requirements for the system. These requirements are prioritized using some criteria. As this project is developing using DSDM then the prioritization of the requirements will be done using Moscow prioritization technique. In Moscow prioritization there is four categories. Must Have – top most requirement, Should Have – not mandatory but highly desirable, Could Have – nice to have and Won't Have – not needed at that time. (simplilearn, 2020). The prioritization of the identified requirements using Moscow technique are discussed in following topic.

8.9.1 MUST HAVE Requirements

To identify the Must Have requirement symbolic letter and number will be used and that will be **MH-1**.

MH-1 – User can register and log in in the system.

MH-2 – User can manage Chicken Purchase data.

MH-3 – User can manage Food Purchase Data.

MH-4 – User can manage Medicine Purchase Data.

MH-5 – User can manage Chicken Sale Data.

MH-6 – User can generate chicken batch wise details report.

8.9.2 Should Have Requirements

To identify the Should Have requirement symbolic letter and number will be used and that will be **SH-1**.

SH -1 – User can manage Chicken Mortality.

SH-2 – User can manage Food Given Data.

SH-3 – User can manage Medicine Given Data.

SH-4 – User can generate Food Inventory report.

SH-5 – User can generate Medicine Inventory report.

SH-6 – User can generate Chicken Inventory report.

8.9.3 Could Have Requirements

To identify the Could Have requirement symbolic letter and number will be used and that will be **CH-1**.

CH-1 – User can manage transportation Cost.

CH-2 – User can manage customer details data.

8.9.4 Won't Have Requirements

To identify the Won't Have requirement symbolic letter and number will be used and that will be **WH-1**.

WH-1 – User can manage other expense data.

8.10 Requirement Catalog

Requirement catalogue for the above requirements are given below

Requirement Symbolic Name: MH-1

Source	**Sign Off**	**Priority**	**Requirement Identification Name**
User	User	Must-Have	MH-1
Functional Requirements: User can register themselves to the system and login to the system. After Login user can access the system and execute their roles for the system.			
Non-Functional Requirements:			
Statement	**Target Value**	**Acceptable Value**	**Comments**
User per day login limitation to the system.	300(per day)	300(per day)	User can access the system.

Requirement Symbolic Name: MH-2

Source	Sign Off	Priority	Requirement Identification Name
User	User	Must-Have	MH-2
Functional Requirements: User can manage chicken purchase of the farm by accessing to the system. And can able to generate report for chicken purchase.			
Non-Functional Requirements:			
Statement	**Target Value**	**Acceptable Value**	**Comments**
User per day chicken purchase report generation limit.	30(per day)	60(per day)	User can generate chicken purchase report using system.

Requirement Symbolic Name: MH-6

Source	Sign Off	Priority	Requirement Identification Name
User	User	Must-Have	MH-6
Functional Requirements: User can generate chicken batch wise details report for the chicken of the farm.			
Non-Functional Requirements:			
Statement	**Target Value**	**Acceptable Value**	**Comments**

User per day chicken batch wise details report generation limit.	30(per day)	60(per day)	User can generate batch wise details report for the chicken.

Requirement Symbolic Name: SH-4

Source	**Sign Off**	**Priority**	**Requirement Identification Name**
User	User	Should-Have	SH-4
Functional Requirements: User can manage food inventory for the farm and generate report for food inventory using the system.			
Non-Functional Requirements:			
Statement	**Target Value**	**Acceptable Value**	**Comments**
User per day report generation limit for food inventory.	40(per day)	90(per day)	User can generate report for the food inventory.

Requirement Symbolic Name: SH-5

Source	**Sign Off**	**Priority**	**Requirement Identification Name**
User	User	Should-Have	SH-5

Functional Requirements: User can manage Medicine inventory for the farm and generate report for medicine inventory using the system.			
Non-Functional Requirements:			
Statement	**Target Value**	**Acceptable Value**	**Comments**
User per day report generation limit for medicine inventory.	40(per day)	90(per day)	User can generate report for the medicine inventory.

9. New system design and architecture

9.1 Use case diagram

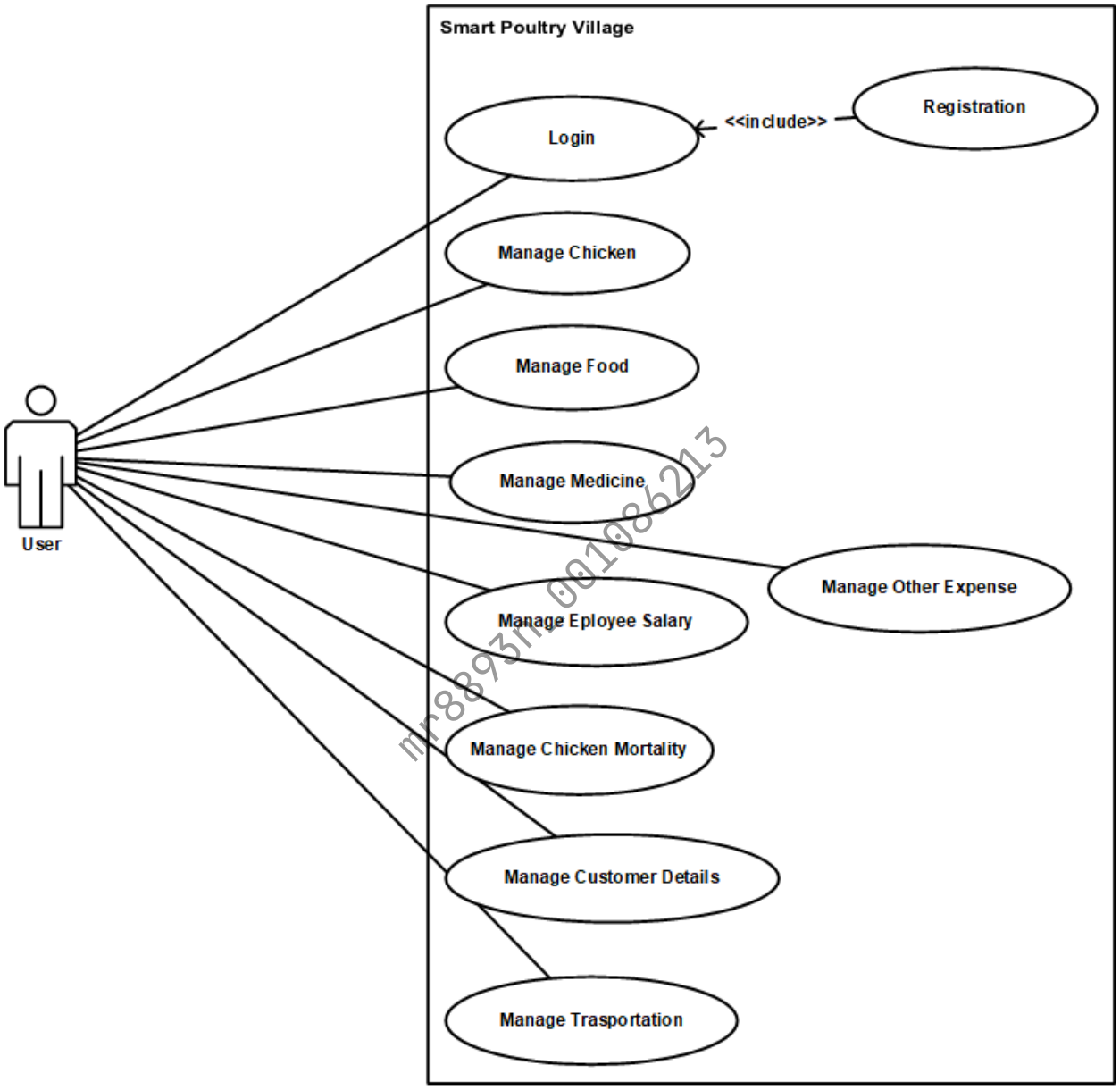


Figure 26: Use case diagram for the system

9.2 Use Case Description

ID for Use Cases	Action by the Actor	Response of the system
UC – 01	User register to the system and login to the system to access the system.	System will allow user to register first and by logging in access to the system.
UC-02	User can manage chicken of the farm by storing and generating data.	System will enable user to manage the by storing and generating data.
UC-03	User can manage food of the chicken for the farm by using the system to store and generating report.	System will enable user to manage food of the chicken for the farm to store and generating report.
UC-04	User can manage medicine of the chicken for the farm by using the system to store and generating report.	System will enable user to manage medicine of the chicken for the farm to store and generating report.
UC-05	User can manage Transportation cost of chicken using the System.	System will enable user to manage Transportation cost of chicken by storing and generating report.

Rest of the description are given in **Appendix – D**.

9.3 Database Design

9.3.1 Entity Relationship Diagram (UML notation)

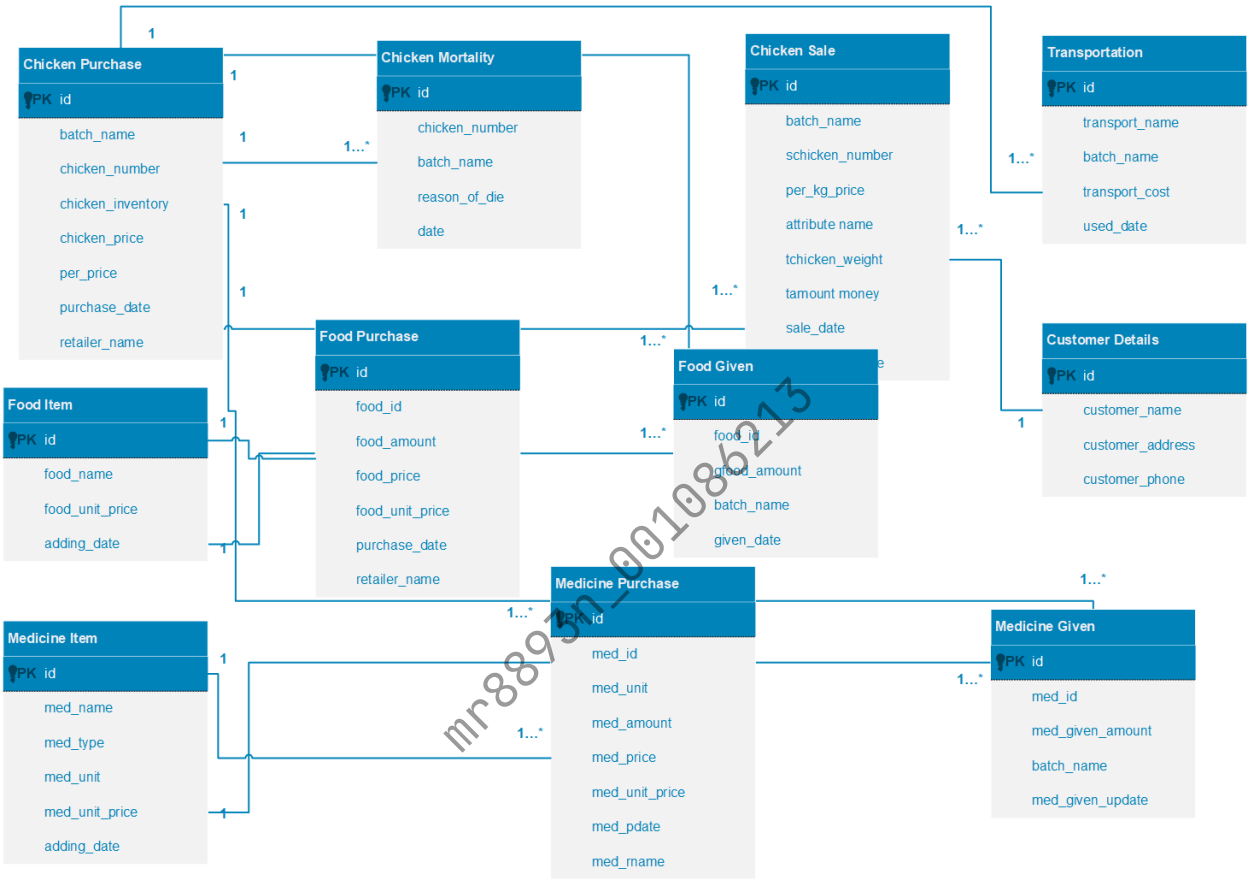


Figure 27: Entity Relationship diagram with UML notation for the project.

9.3.2 Data Mapping

User: id, farm_name, ful_name, email_address, phone_number, hashed_password

Chicken_mortality: id, chicken_number, **batch_name***, reason_of_die, date

Chicken_Purchase: id, batch_name, chicken_inventory, chicken_price, per_price ,purchase_date, retailer_name

Chicken_sale: id, batch_name*, schicken_number, per_kg_price, tchicken_weight, tamount_money, sale_date, **customer_name***

Food_Item: id, food_name, food_unit_price, adding_date

Food_Purchase: id, food_id, food_amount, food_price, **food_unit_price***, purchase_date, retailer_name

Food_Given: id, food_id*, gfood_amount, **batch_name***, given_date

Medicine_Item: id, med_name, med_type, med_unit, med_unit_price, adding_date

Medicine_purchase: id, med_id**, med_unit***, med_amount, med_price, **med_unit_price***, med_pdate, med_rnmae

Medicine_Given: id, med_id*, med_given_amount, **batch_name***, med_given_date

Employee_Salary: id, employee_name, employee_address, employee_phone, salary_amount, given_date

Customer _Details: id, customer_name, customer_address, customer_phone

Transportation: id, transport_name, **batch_name***, transport_cost, used_date

Other Expenses: id, employee_name*, buying_reason, element_price, buying_date

9.3.3 Normalization

Third Normal Form for Food Given table

id	Food Name	Amount of Food Given	Batch Name	Given Date
01	Maze Broken	5kg	CH-1	11-25-2020

02	Rice Broken	2kg	CH-2	11-25-2020

3rd Normal Form

Food Given Table

Id	**Amount of Food Given**	**Given Date**	**Food id**	**Batch id**
01	5kg	11-25-2020	01	01
02	2kg	11-25-2020	02	02

Food Table

Food id	**Food Name**
01	Maze Broken
02	Rice Broken

Batch Table

Batch id	**Batch Name**
01	CH-1
02	CH-2

9.4 Class Diagram

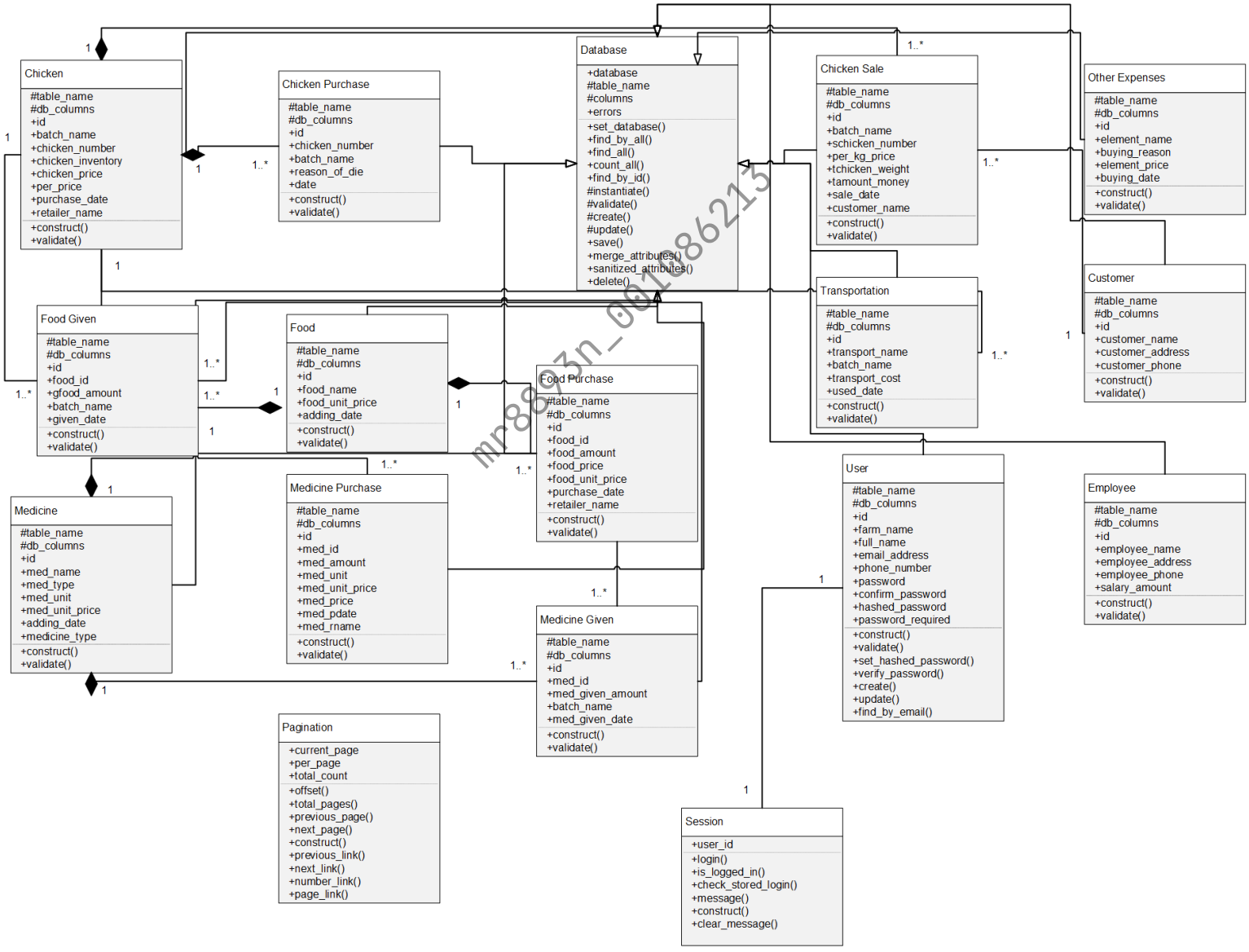


Figure 28: Class Diagram of the project.

9.6 Component Diagram

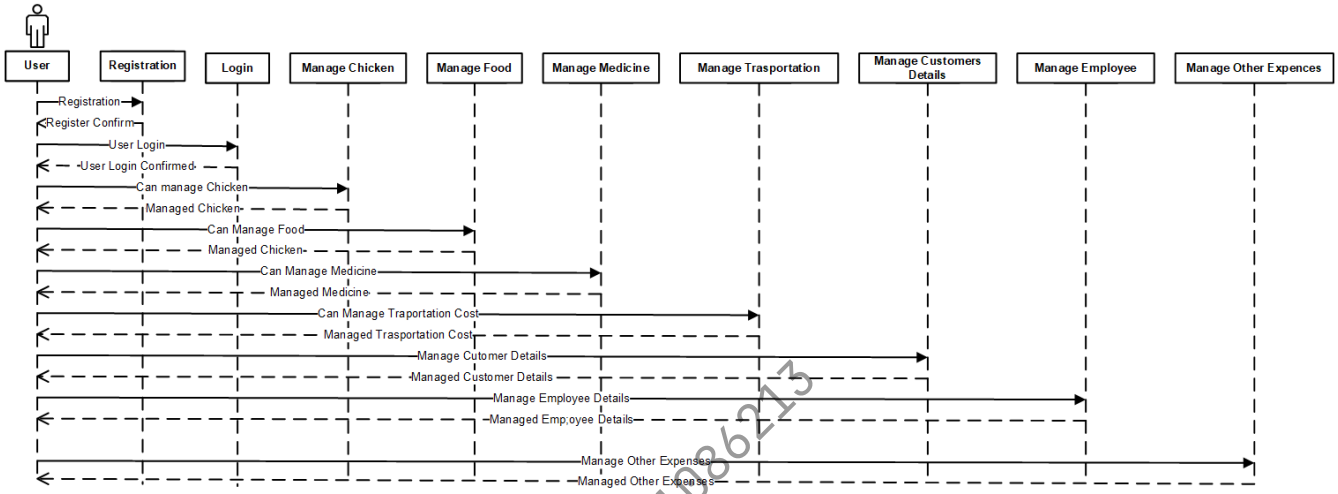


Figure 29: Sequence diagram for the system.

9.6 Component Diagram

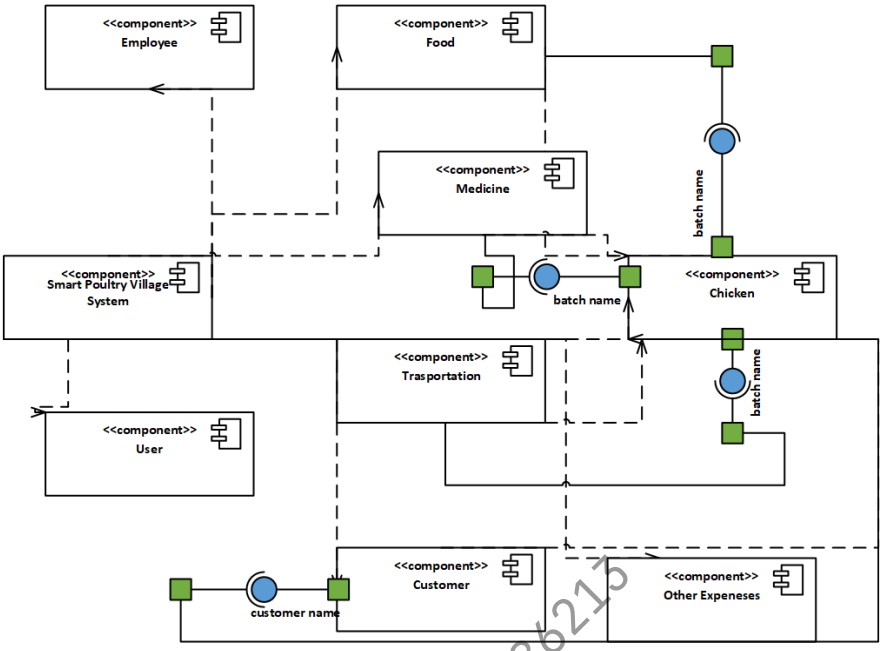


Figure 30: Component diagram for the system.

9.7 Deployment Diagram

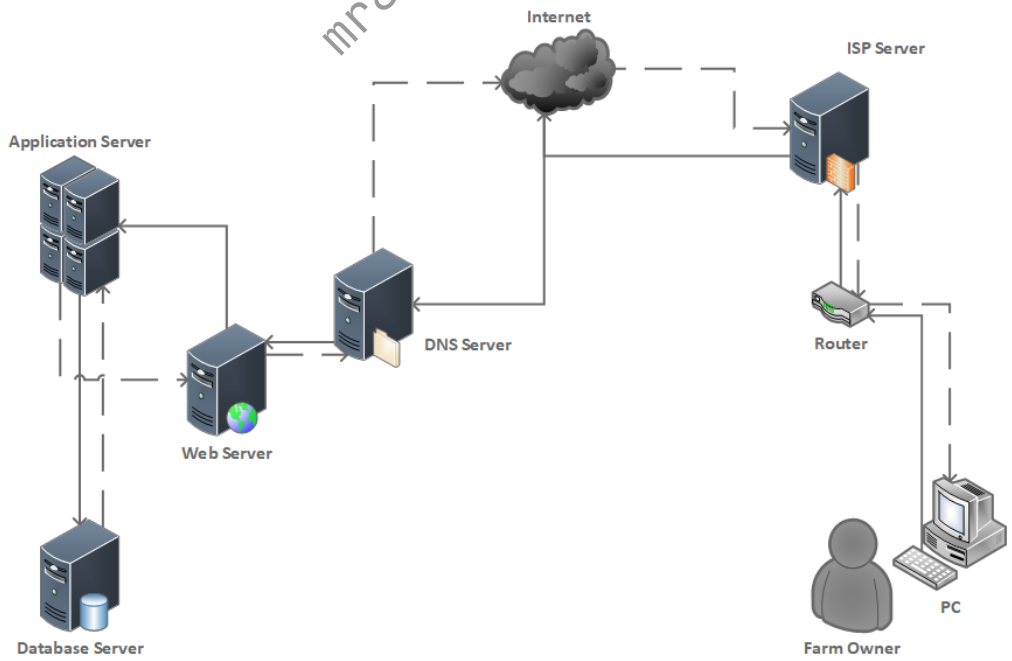


Figure 31: Deployment Diagram.

9.8 Low-fidelity wireframes for protypes

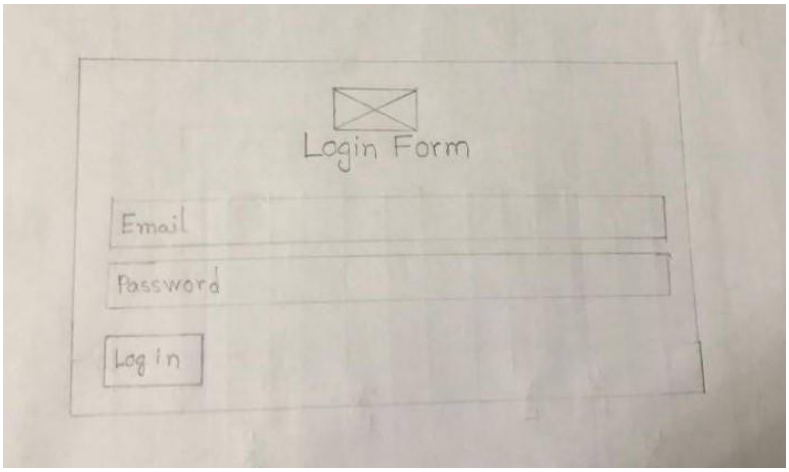


Figure 32: low fidelity wireframe for Log in form page

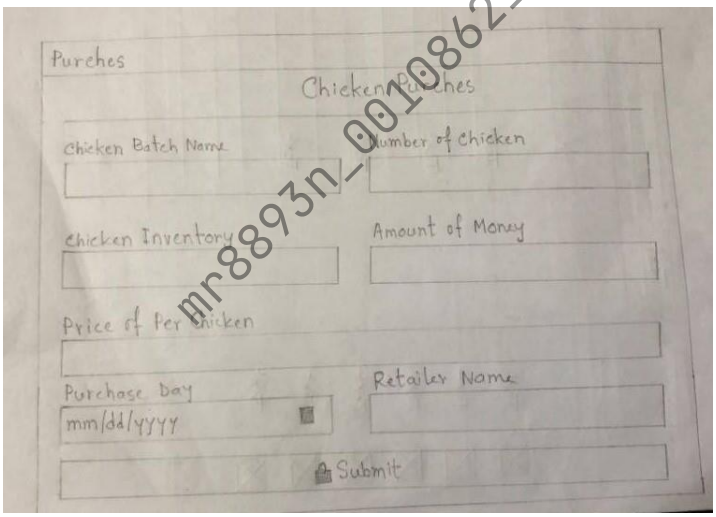


Figure 33: Low fidelity wireframe for chicken purchase form.

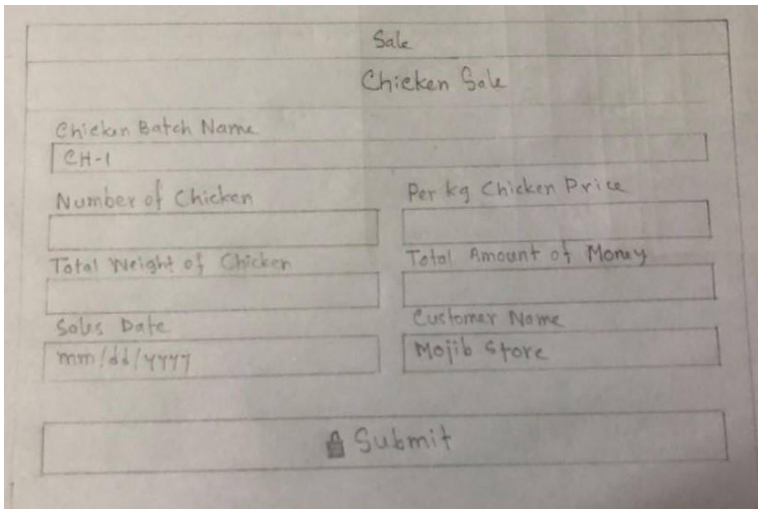


Figure 34: Low fidelity wireframe for chicken sale form.

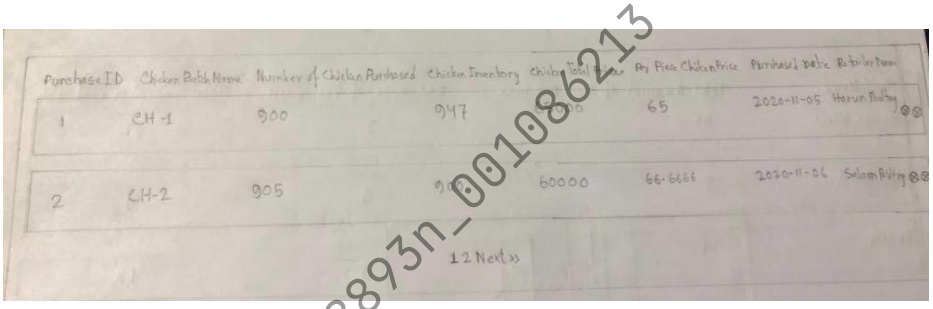


Figure 35: Low fidelity wireframe for chicken purchase report.

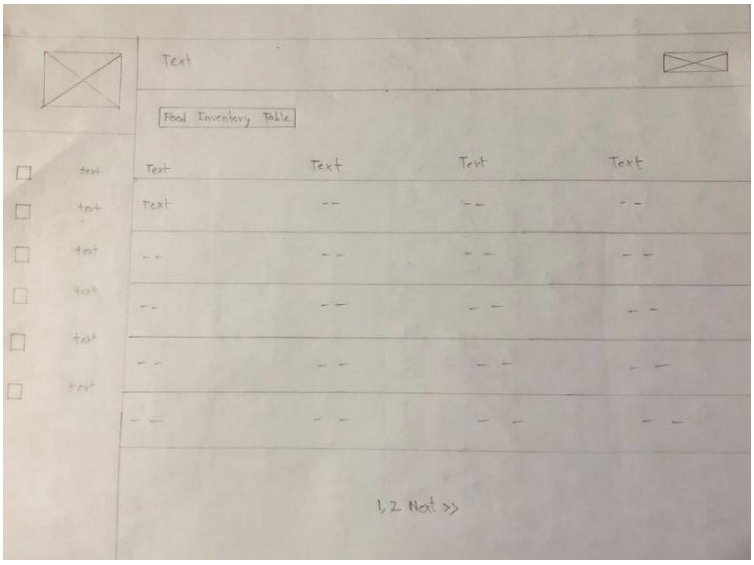


Figure 36: Low fidelity wireframe for food inventory page.

10 Review of technology

For implementing the developed system different technology needed in an organization. Technologies for implementation can be client server technology and web server technology. And this technology will be chosen by considering the developing system and business process. For the implementation of developing system, a technology will be chosen after giving justification for the chosen one.

Client Server Application

This technology is used mainly in organization. The main working procedure of this technology is client ask for information from the server and server will provide the information to that client. And a server at a time can serve multiple client at a time on the other side a client can only take service from one server. (tutorialspoint, 2020) This technology is user for particular number of people.

Some features of Client Server Application are:

I. It uses two-tier architecture.

II. It requires installation on the client's machine.

III. Its server overloaded when client increases.

IV. It allows limited number of clients to use server.

Web Server Technology

This technology is mainly used for vast number of people. This stores the application in the web server. Where everybody can access the application by using browser through internet connection. This can serve huge amount of people at a time.

Some features of Web Server Application are:

I. It uses multiple-tier architecture.

II. It does not require installation on user machine.

III. With the increase of user there is no difference in the service.

IV. It allows multiple number of users to use applications.

Justification for the chosen one

For the implementation of developing system Web Server Technology will be used. Because using web server technology multiple user can use the application. All the user will need a browser and internet connection. The developing system is poultry farm management which will be accessed by many people to use for managing their farm. Web server technology provides multiple user access at a time. For that reason, Web server Application will be the best choice for implementation of developing system.

11 Development

11.1 New system modules

User Module

- User can register to the system providing asked information.
- User can login to the system providing registered email and password.
- User can update their provided information.
- User can update user password.
- User can see provided dashboard.

Chicken Module

- User can manage chicken purchase.
- User can manage chicken mortality.
- User can manage chicken sale.

Food Module

- User can manage food and food purchase.
- User can manage food given.
- User can manage food inventory.

Medicine Module

- User can manage medicine and medicine purchase.
- User can manage medicine Inventory.

Customer Module

- User can manage customer details.

Expense Module

- User can manage employee.
- User can manage transportation cost.
- User can manage other expense of the farm.

Chicken Expanse and Cost Module

- User can generate report of batch wise chicken expense and cost.

11.2 High-fidelity prototypes of new modules

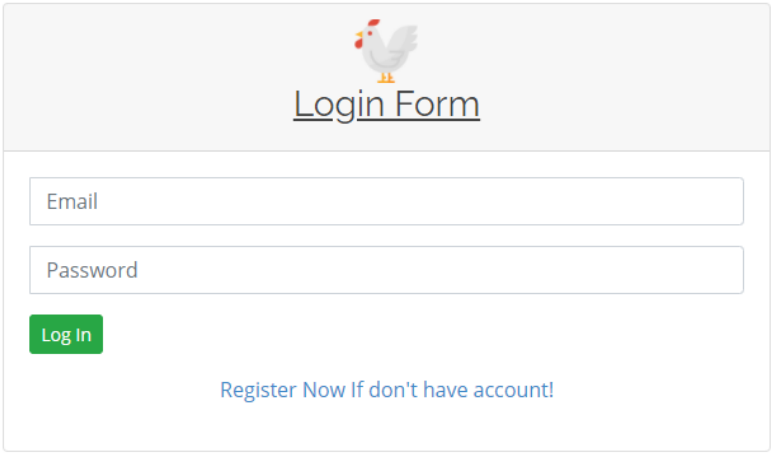


Figure 37: High fidelity protype for login form.

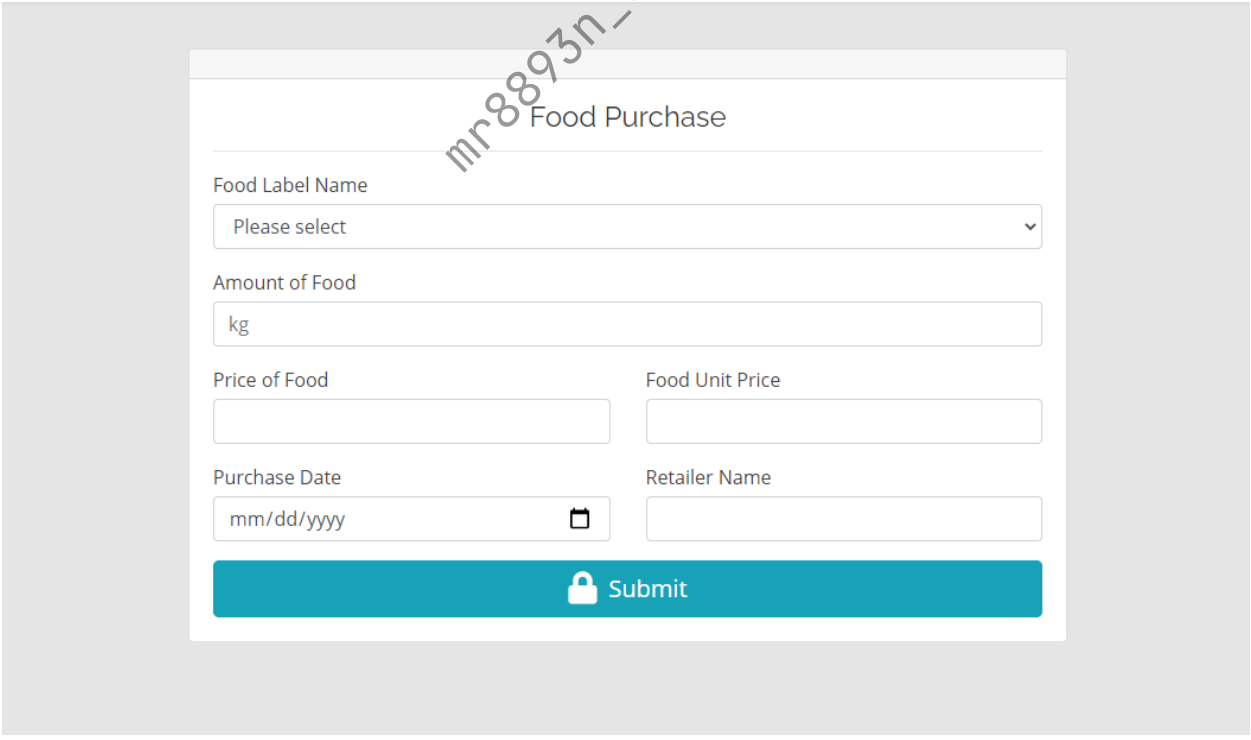


Figure 38: High Fidelity prototype for food purchase form.

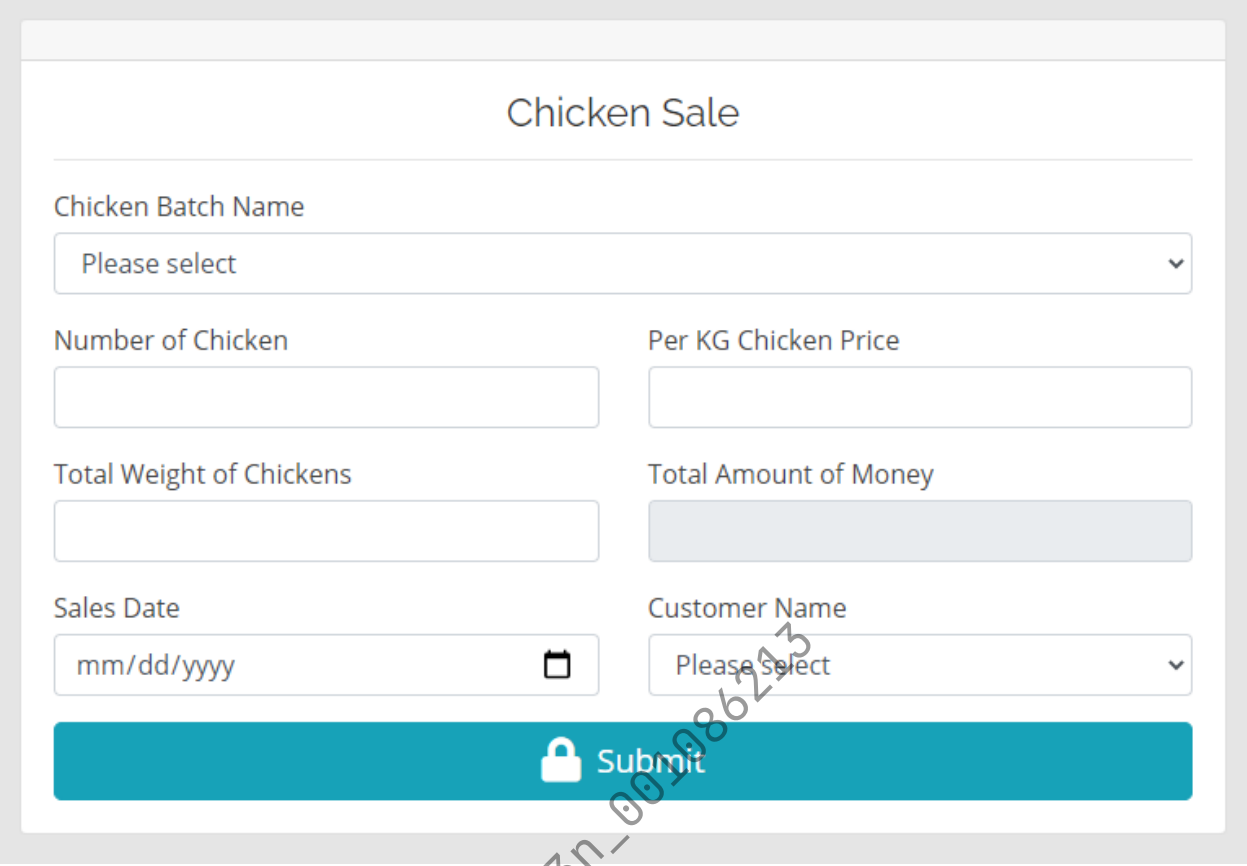


Figure 39: High fidelity prototype for chicken sale form.

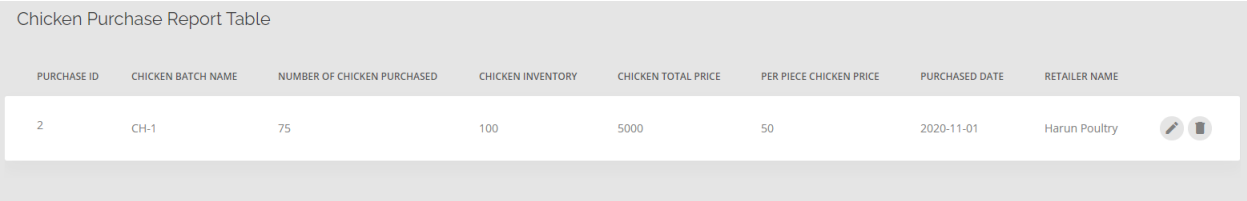


Figure 40: High fidelity prototype for chicken purchase report.

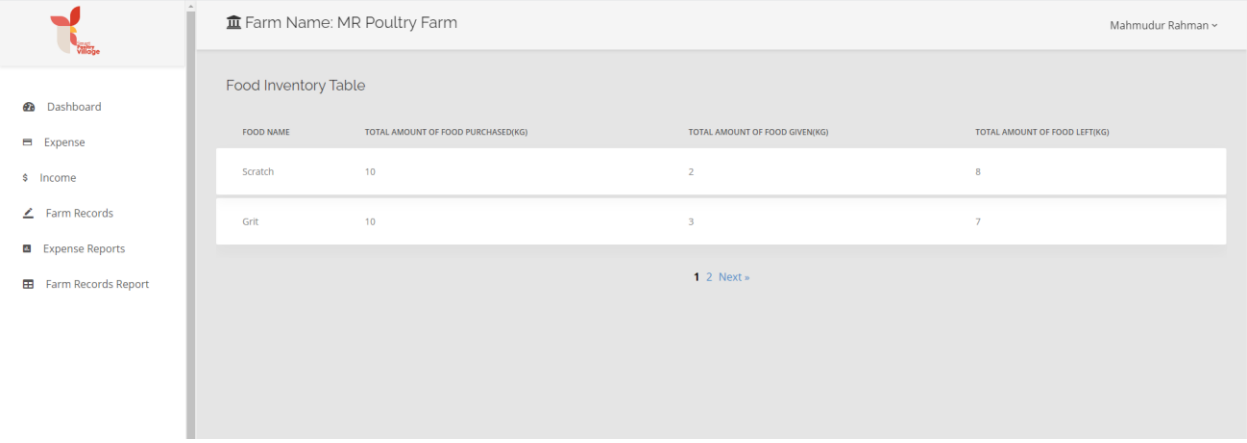


Figure 41: High fidelity prototype for food inventory page.

11.3 Timeboxing breakdown by Modules

Before starting development for each module. As this project is developing using DSDM methodology all the modules will be put in timebox to get the best outcome of each module. As each time box have time limit so each module will be completed within this time box. Beside this is an academic project and project need to be submitted in time. For the development of the system there is allocated time duration is 35 days. Now each module will be assigned to the time box my distributing 35 days of development of the system. The distribution of time box for developing modules are given below:

Modules Name	**Time Box Number Will Use**
User Module	01
	02
Chicken Module	03
Food Module	04

	05
Medicine Module	06
Customer Module	07
Expense Module	08
Chicken Expanse and Cost Module	09
	10

11.4 Possible problem breakdown in complex module

Developing all the modules there are some module which will be complex to develop. Like that in this project in some module problem or complexity arise while developing. This risen problem and complexity are solved using iterations development process. Those complexity are discussed below with their respective code.

11.4.1 Iterations 1

I have faced problem while developing user module. In user module I cannot update the password of the user. There was some error in the code. Then for solving the problem I have used iterations steps. Then I found some error in the code I solve that. And there was some error in the logic of updating. Then I update the logic. Wrote right code and then updating password work correctly. By using iteration process, I have solved the problem.

```php
<?php
class User extends Database {
static protected $table_name = "user";
static protected $db_columns = ['id', 'farm_name', 'full_name', 'email_address', 'phone_number', 'hashed_password'];

public $id;
public $farm_name;
public $full_name;
public $email_address;
public $phone_number;
public $password;
public $confirm_password;
public $hashed_password;
public $password_required = true;

public function __construct($args=[]){
    $this->farm_name = $args['farm_name'] ?? '';
    $this->full_name = $args['full_name'] ?? '';
    $this->email_address = $args['email_address'] ?? '';
    $this->phone_number = $args['phone_number'] ?? '';
    $this->password = $args['password'] ?? '';
    $this->confirm_password = $args['confirm_password'] ?? '';

}

    public function set_hashed_password() {
        $this->hashed_password = password_hash($this->password, algo: PASSWORD_BCRYPT);
    }

    public function verify_password($password) {
        return password_verify($password, $this->hashed_password);
    }


    protected function create() {
        $this->set_hashed_password();
        return parent::create();
    }

    protected function update() {
        if($this->password != '') {
            $this->set_hashed_password();
            // validate password
        } else {
```


Figure 42: Code of update password

```php
<?php include_once 'includes/head.php' ?>
<?php include_once 'includes/top_bar.php'; ?>
<?php include_once 'includes/nav_bar.php' ?>
<?php
require_once('includes/init.php');
if(!isset($_GET['id'])) {
    redirect_to(url_for( script_path: 'user_details.php'));
}
$id = $_GET['id'];
$user = User::find_by_id($id);
if($user == false) {
    redirect_to(url_for( script_path: 'user_details.php'));
}

if(is_post_request()) {

    // Save record using post parameters
    $args = $_POST['user'];
    $user->merge_attributes($args);
    $result = $user->save();

    if($result === true) {


    } else {
        // show errors
    }

} else {

    // display the form

}
?>
```


Figure 43: Code of update password

11.4.2 Iterations – 2

While developing Food Module I have faced complexity in creating inventory for the food. I cannot retrieve food data from different food table. When I faced complexity than I started iteration

process to solve the complexity. And firstly, I solved the problem of retrieving data from different food table. And another problem raised that food given amount value in to subtracting from the total amount. Then again used iteration process and found problem in SQL and writing the correct SQL I have solved the problem all happened in iterations process.

```
<?php include_once 'includes/dashboard/head.php' ?>
<?php include_once 'includes/dashboard/slider.php' ?>
<?php require_once('includes/init.php'); ?>


<div class="page-container">
    <header class="header-desktop">
        <div class="section__content section__content--p30">
            <div class="container-fluid">
                <div class="header-wrap">
                    <h3> Food Inventory</h3>
                </div>
            </div>
        </div>
    </header>
    <div class="main-content">
        <div class="section__content section__content--p30">
            <div class="container-fluid">
                <div class="row">
                    <div class="col-md-12">
                        <!-- DATA TABLE -->
                        <h3 class="title-5 m-b-35">data table</h3>

                    </div>
                    <div class="table-responsive table-responsive-data2">
                        <table class="table table-data2">
                            <thead>
                            <tr>
                                <th>Food Name</th>
                                <th>Total Amount Of Food Purchased</th>
                                <th>Total Amount Of Food Given</th>
                                <th>Total Amount Of Food Left</th>
                            </tr>
                            </thead>
                            <tbody>
```


Figure 44: Code of food inventory.

```
                        <tbody>
                        <?php
                            $sql = "SELECT food_item.food_name,q1.TotalFood,q2.GivenFood,(q1.TotalFood-q2.GivenFood) AS 'TotalAmount' FROM food_item
                            LEFT JOIN
                            (SELECT food_id,SUM(food_amount) AS 'TotalFood' FROM `food_purchase_detail` GROUP BY food_id) AS q1
                            ON q1.food_id = food_item.id
                            LEFT JOIN
                            (SELECT food_id,SUM(gfood_amount) AS 'GivenFood' FROM `food_given` GROUP BY food_id) AS q2
                            ON q2.food_id = food_item.id";
                            $foodinventorys = Database::$database->query($sql);
                            foreach ($foodinventorys as $foodinventory=>$value){
                        ?>

                            <tr class="tr-shadow">
                                <td><?php echo $value['food_name'] ?></td>
                                <td><?php echo $value['TotalFood'] ?></td>
                                <td><?php echo $value['GivenFood'] ?></td>
                                <td><?php echo $value['TotalAmount'] ?></td>
                            </tr>
                            <tr class="spacer"></tr>
                        <?php } ?>
                        </tbody>
                    </table>
                </div>
                <!-- END DATA TABLE -->
            </div>
        </div>
    </div>
</div>

<?php include_once 'includes/dashboard/footer.php' ?>
```

Figure 45: Code of food inventory.

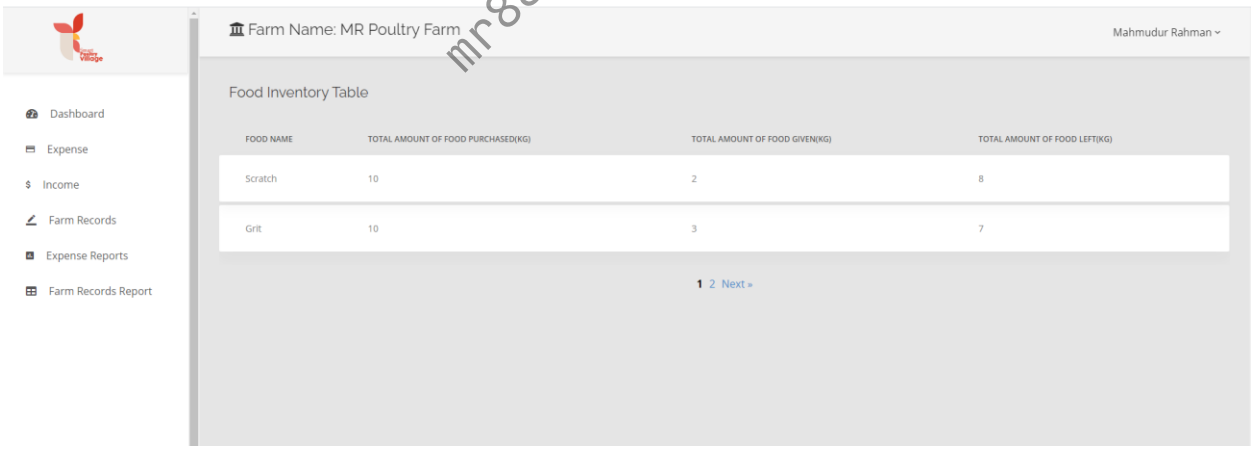


Figure 46: Food Inventory Page.

11.4.3 Iterations – 3

In chicken expense and cost module I found complexity while getting data for each batch consumed food, medicine and cost from different table and adding total cost and expense. It was huge problem. I started iteration process for solving the complexity. Using iterations, I made small SQL and then started to join them according to logic. And at last I made a big SQL and that works perfectly for my desired data collection and calculation from different table.

```
<?php include_once 'includes/dashboard/head.php' ?>
<?php include_once 'includes/dashboard/slider.php' ?>
<?php require_once('includes/init.php'); ?>

<div class="page-container">
    <header class="header-desktop">
        <div class="section__content section__content--p30">
            <div class="container-fluid">
                <div class="header-wrap">
                    <h3> Chicken Batch Report</h3>
                </div>
            </div>
        </div>
    </header>
    <div class="main-content">
        <div class="section__content section__content--p30">
            <div class="container-fluid">
                <div class="row">
                    <div class="col-md-12">
                        <!-- DATA TABLE -->
                        <h3 class="title-5 m-b-35">data table</h3>

                    </div>
                    <div class="table-responsive table-responsive-data2">
                        <table class="table table-data2">
                            <thead>
                            <tr>

                                <th>Batch Name</th>
                                <th>Purchase Price</th>
                                <th>Food Cost</th>
                                <th>Medicine Cost</th>
                                <th>Transport Cost</th>
                                <th>Mortality</th>
                                <th>Total Expense</th>
                                <th>Total Income</th>

                            </tr>
                            </thead>
                            <tbody>
```


Figure 47: Code for chicken batch watch report.

```
<tbody>
<?php
$current_page = $_GET['page'] ?? 1;
$per_page = 10;
$total_count = FoodPurchase::count_all();

$pagination = new Pagination($current_page, $per_page, $total_count);

    $sql = "SELECT chicken_purchase.batch_name,q1.Sell,q2.Purchase,q3.FoodCost,q4.MedCost,q5.Mortality,q6.TransportCost,(q2.Purchase+q3.FoodCost+q4.MedCost+q6.TransportCost) AS 'TotalE
            LEFT JOIN
            (SELECT batch_name,SUM(tamount_money) AS 'Sell' FROM `chicken_sale` GROUP BY batch_name) AS q1
            ON q1.batch_name = chicken_purchase.batch_name
            LEFT JOIN
            (SELECT batch_name,chicken_price AS 'Purchase' FROM chicken_purchase GROUP BY batch_name) AS q2
            ON q2.batch_name = chicken_purchase.batch_name
            LEFT JOIN
            (SELECT batch_name,SUM(food_unit_price*gfood_amount) AS 'FoodCost' FROM `food_given` INNER JOIN food_item ON food_given.food_id=food_item.id GROUP BY batch_name) AS q3
            ON q3.batch_name = chicken_purchase.batch_name
            LEFT JOIN
            (SELECT batch_name,SUM(med_unit_price*med_given_amount) AS 'MedCost' FROM med_given INNER JOIN med_item ON med_given.med_id=med_item.id GROUP BY batch_name) AS q4
            ON q4.batch_name = chicken_purchase.batch_name
            LEFT JOIN
            (SELECT batch_name,SUM(chicken_number) AS 'Mortality' FROM chicken_mortality GROUP BY batch_name) AS q5
            ON q5.batch_name = chicken_purchase.batch_name
            LEFT JOIN
            (SELECT batch_name,SUM(transport_cost) AS 'TransportCost' FROM transpotation GROUP BY batch_name) AS q6
            ON q6.batch_name = chicken_purchase.batch_name
             ";
    $sql .= "LIMIT {$per_page} ";
    $sql .= "OFFSET {$pagination->offset()}";
    $batch_details = Database::$database->query($sql);
    foreach ($batch_details as $batch_detail=>$value){

    ?>
    <tr class="tr-shadow">

        <td>
            <?php echo $value['batch_name'] ?>
        </td>
        <td>
            <?php echo $value['Purchase'] ?>
        </td>
        <td><?php echo $value['FoodCost'] ?></td>
        <td><?php echo $value['MedCost'] ?></td>
```


Figure 48:Code for chicken batch watch report.

```
"SELECT chicken_purchase.batch_name,q1.Sell,q2.Purchase,q3.FoodCost,q4.MedCost,q5.Mortality,q6.TransportCost,(q2.Purchase+q3.FoodCost+q4.MedCost+q6.TransportCost) AS 'TotalExpence' FROM chicken_purchase
LEFT JOIN
(SELECT batch_name,SUM(tamount_money) AS 'Sell' FROM `chicken_sale` GROUP BY batch_name) AS q1
ON q1.batch_name = chicken_purchase.batch_name
LEFT JOIN
(SELECT batch_name,chicken_price AS 'Purchase' FROM chicken_purchase GROUP BY batch_name) AS q2
ON q2.batch_name = chicken_purchase.batch_name
LEFT JOIN
(SELECT batch_name,SUM(food_unit_price*gfood_amount) AS 'FoodCost' FROM `food_given` INNER JOIN food_item ON food_given.food_id=food_item.id GROUP BY batch_name) AS q3
ON q3.batch_name = chicken_purchase.batch_name
LEFT JOIN
(SELECT batch_name,SUM(med_unit_price*med_given_amount) AS 'MedCost' FROM med_given INNER JOIN med_item ON med_given.med_id=med_item.id GROUP BY batch_name) AS q4
ON q4.batch_name = chicken_purchase.batch_name
LEFT JOIN
(SELECT batch_name,SUM(chicken_number) AS 'Mortality' FROM chicken_mortality GROUP BY batch_name) AS q5
ON q5.batch_name = chicken_purchase.batch_name
LEFT JOIN
(SELECT batch_name,SUM(transport_cost) AS 'TransportCost' FROM transpotation GROUP BY batch_name) AS q6
ON q6.batch_name = chicken_purchase.batch_name
";
```

Figure 49: Code for chicken batch watch report.

```
                    ?>
                    <tr class="tr-shadow">

                        <td>
                            <?php echo $value['batch_name'] ?>
                        </td>
                        <td>
                            <?php echo $value['Purchase'] ?>
                        </td>
                        <td><?php echo $value['FoodCost'] ?></td>
                        <td><?php echo $value['MedCost'] ?></td>
                        <td><?php echo $value['TransportCost'] ?></td>
                        <td><?php echo $value['Mortality'] ?></td>
                        <td><?php echo $value['TotalExpence'] ?></td>
                        <td><?php echo $value['Sell'] ?></td>

                    </tr>
                    <tr class="spacer"></tr>
                <?php } ?>
                </tbody>
            </table>
        </div>
        <!-- END DATA TABLE -->
    </div>
    <?php
    $url =('batch_details.php');
    echo $pagination->page_links($url);
    ?>
</div>
</div>
</div>
</div>

<?php include_once 'includes/dashboard/footer.php' ?>
```


Figure 50: Code of chicken batch wise financial report.

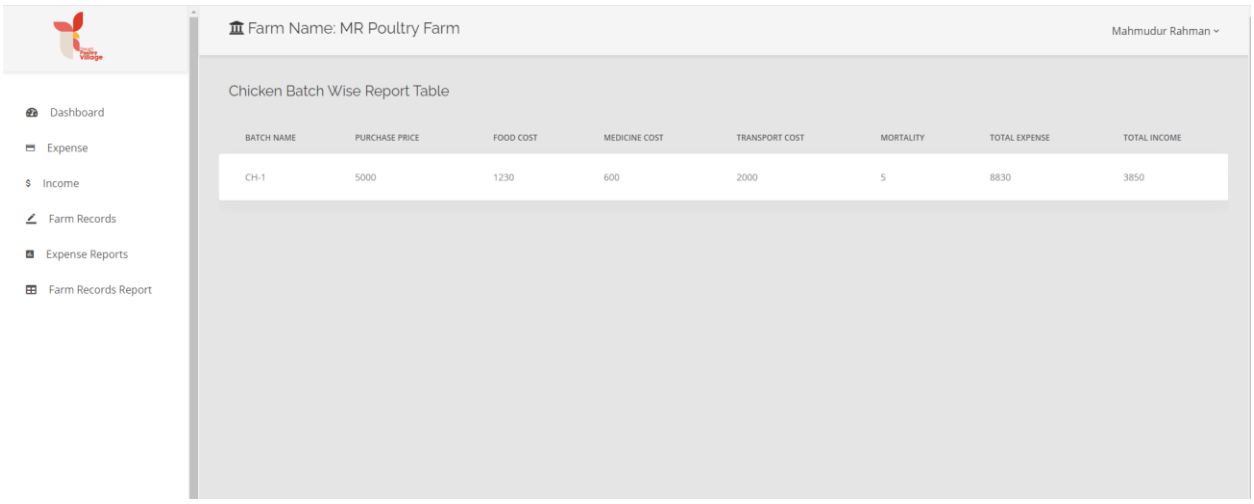


Figure 51: Chicken Batch wise report.

11.5 Potential Alternative Approaches

The complexity of the module is solved using iterations. For solving complexity of module there are some alternatives. If I can't use iterations to solve the complexity of the module, I will go for other alternatives for solving module complexity. That would be waterfall model. In water fall model I will develop the whole system. After developing the system, I will test the system. Then if I found any error or bugs or any complexity in particular module than I will start the development phase from the beginning for solving the complexity and solving error and bugs of the module. And this would be my alternative approaches for solving module complexity.

12 Testing

Testing is required after the development to find out bugs and error in the system. In DSDM test is a must thing to do. After completing each module time box for development of the project testing should be carried out. And for the testing of all module of this project test cases have created that will be discussed in upcoming topics.

12.1 Test Case

SL NO.	Test Type Name	Test Subject
01	Unit Testing	I. User Registration form validation. II. Food Item form validation. III. Customer details form validation
02	Module Testing	
03	Integration Testing	
04	Acceptance Testing	I. User can view their details. II. User can update their details. III. User can view batch wise chicken cost and earning report.
05	Performance Testing	I. Testing in Chrome II. Testing in Microsoft Edge

		III. Testing in Mozilla Firefox.
06	Security Testing	I. Encrypted password II. Invalid user cannot access to the system.
07	Usability Testing	I. Navigation Links
08	Compatibility Testing	I. Testing in Desktop Version. II. Testing in Mobile Version.

12.2 Test Execution

12.2.1 Unit Testing

No of Test	Action	Expected Result	Final Result
01	Form field of user registration form is empty.	Form will not submit and shows error for not filling up the fields.	Error shown and form does not submit.

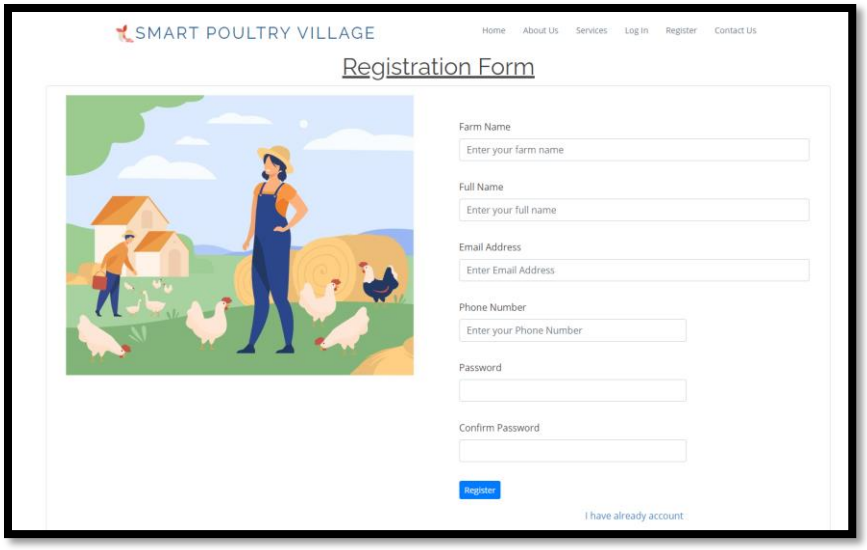


Figure 52: Registration form before empty field submit.

Figure 53: Showing error after submitting empty fields.

No of Test	Action	Expected Result	Final Result
02	If login information provided by user it will show error	After clicking log in error message will shows up.	As expected,

Figure 54: Providing wrong information in login form.

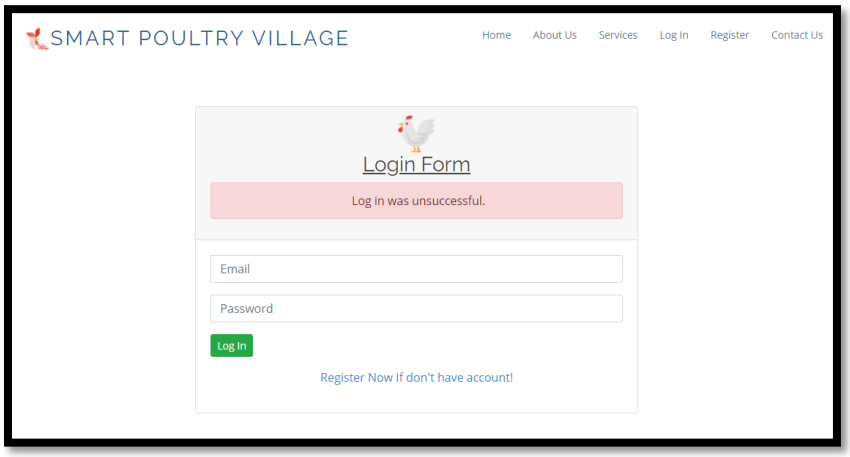


Figure 55: Error message shows up.

12.2.2 Module Testing

No of Test	Action	Expected Result	Final Result
01	User updates user info in update form and save the updated data.	User can see their updated details in a table.	As expected,

Figure 56: Before updating details.

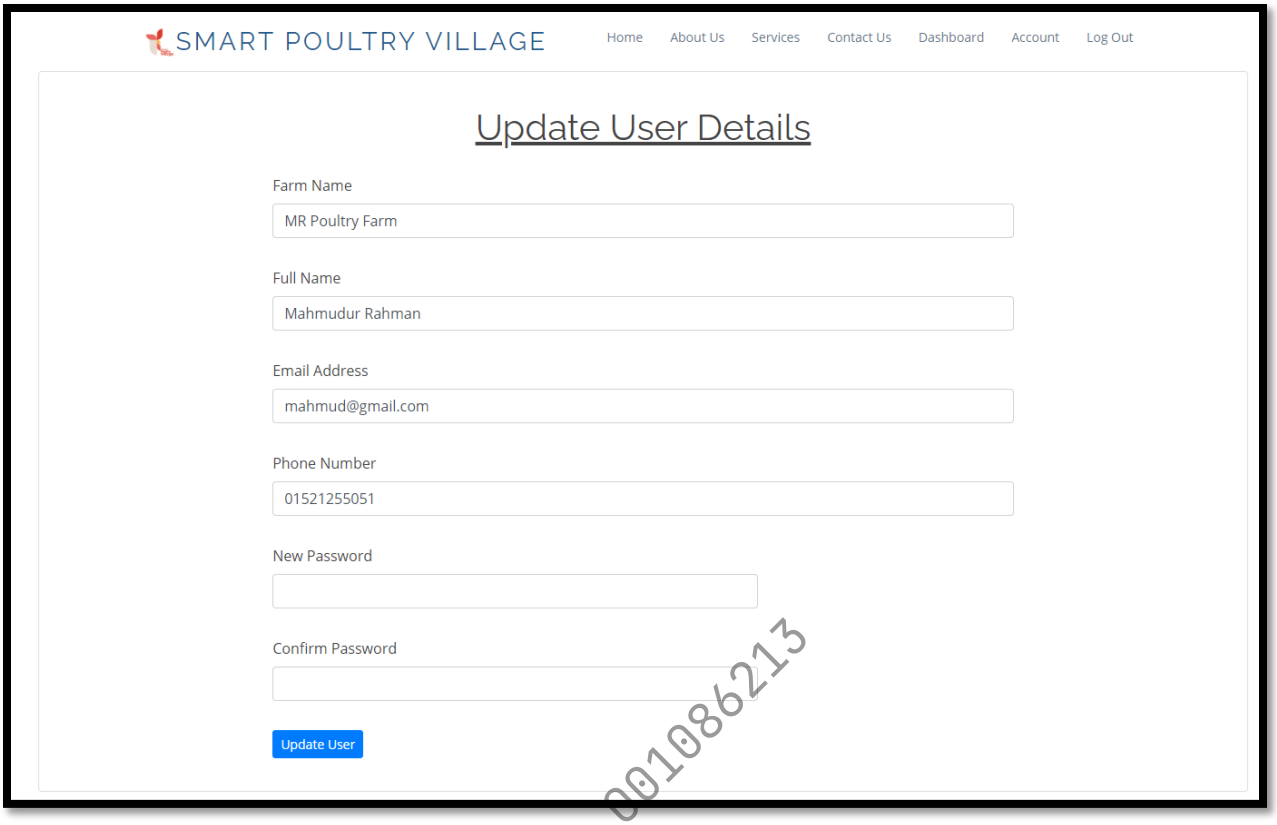


Figure 57: Update form with data.

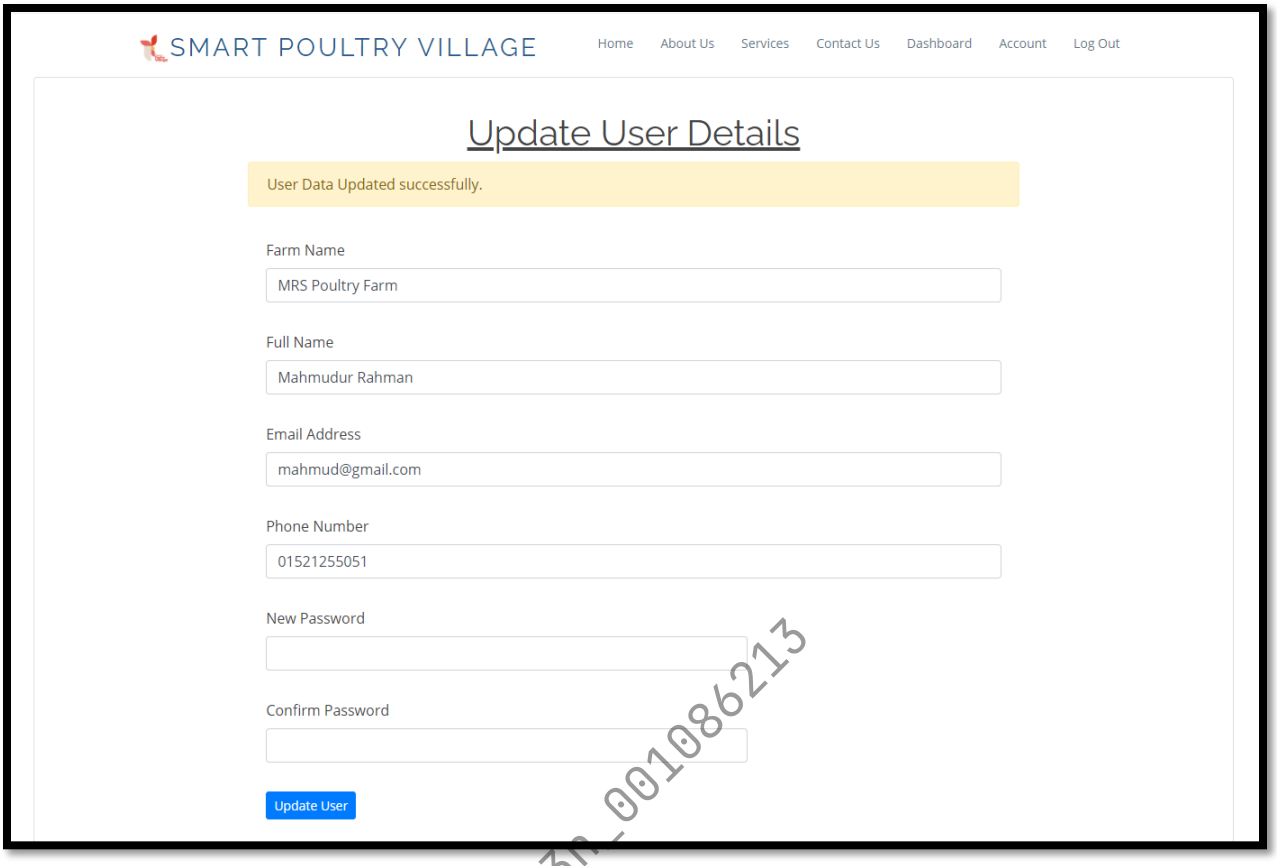


Figure 58: Data updated successfully from MR to MRS.

No of Test	Action	Expected Result	Final Result
02	After clicking logout user gets out from the system.	User redirect to the index page and cannot have access to the system.	As expected,

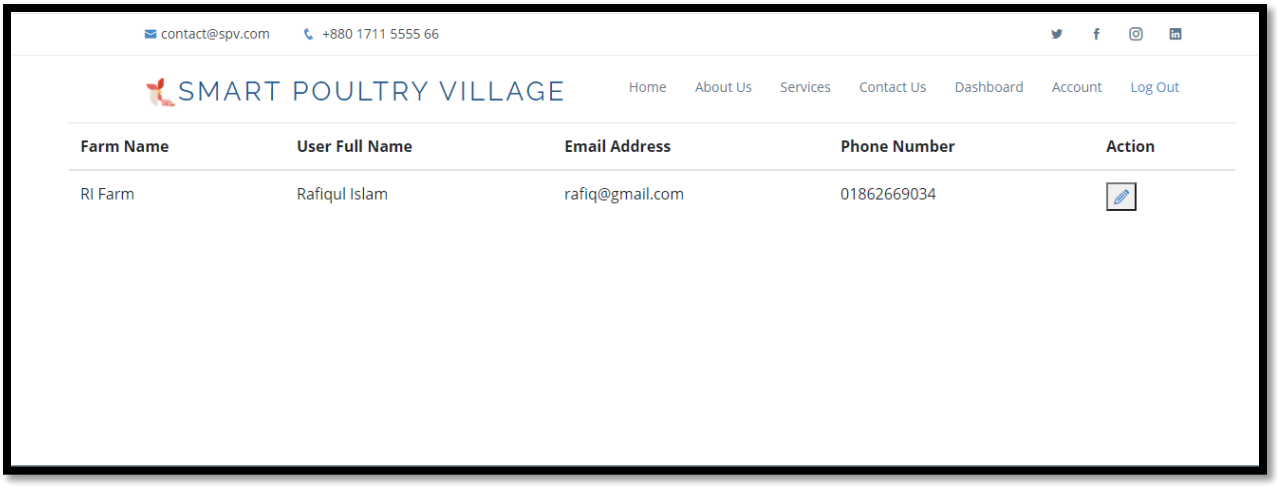


Figure 59: Before clicking on log out.

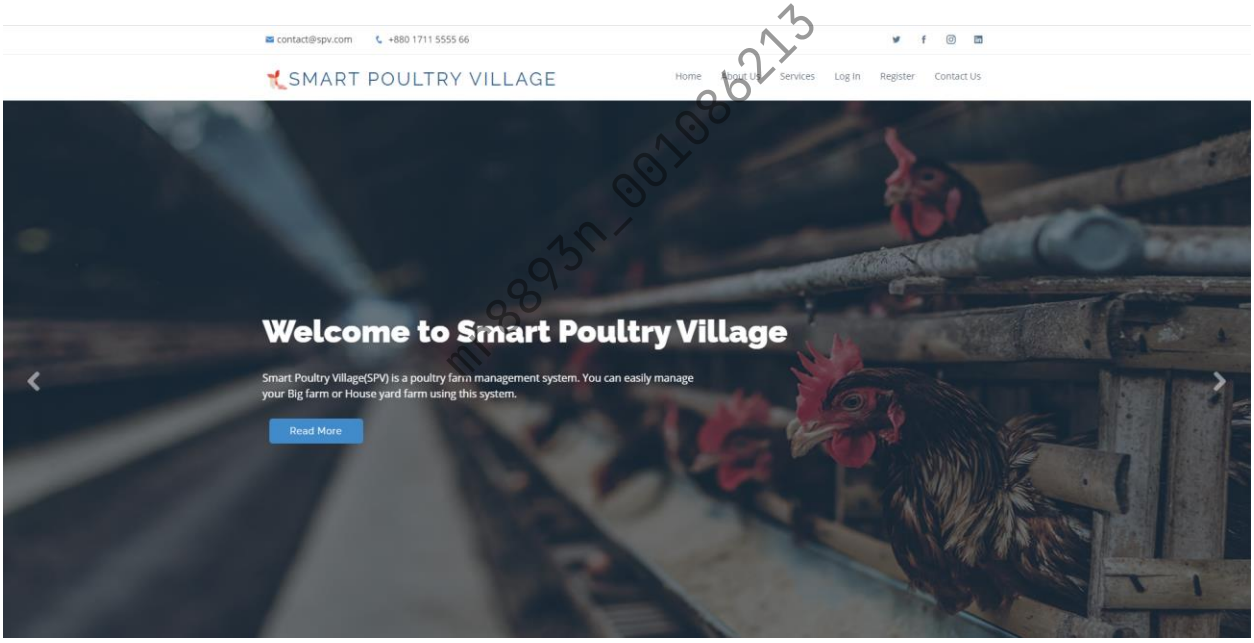


Figure 60: After clicking in logout. User don't have access to the system.

12.2.3 Integration Testing

No of Test	Action	Expected Result	Final Result
01	After submitting registration form by user, it will save in database and user information will show in user details page.	Submitted information in registration form saved in database and shows in user details page.	As expected,

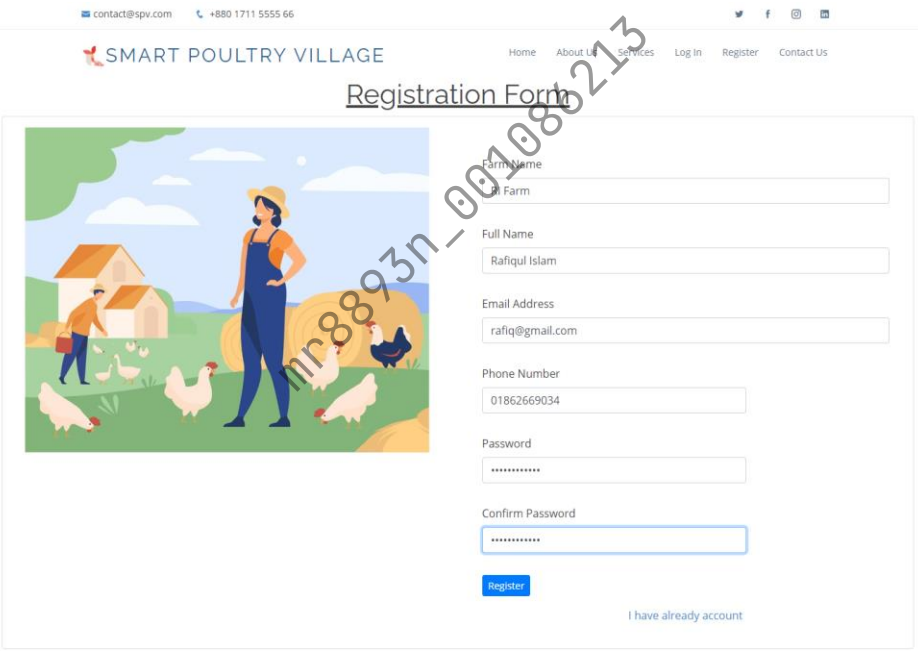
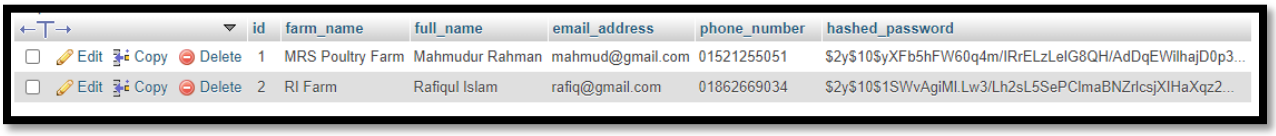


Figure 61: Provided information of user in registration form.



	id	farm_name	full_name	email_address	phone_number	hashed_password
Edit Copy Delete	1	MRS Poultry Farm	Mahmudur Rahman	mahmud@gmail.com	01521255051	$2y$10$yXFb5hFW60q4m/IRrELzLelG8QH/AdDqEWilhajD0p3...
Edit Copy Delete	2	RI Farm	Rafiqul Islam	rafiq@gmail.com	01862669034	$2y$10$1SWvAgiMI.Lw3/Lh2sL5SePCImaBNZrlcsjXIHaXqz2...

Figure 62: User details of registration form saved in database.

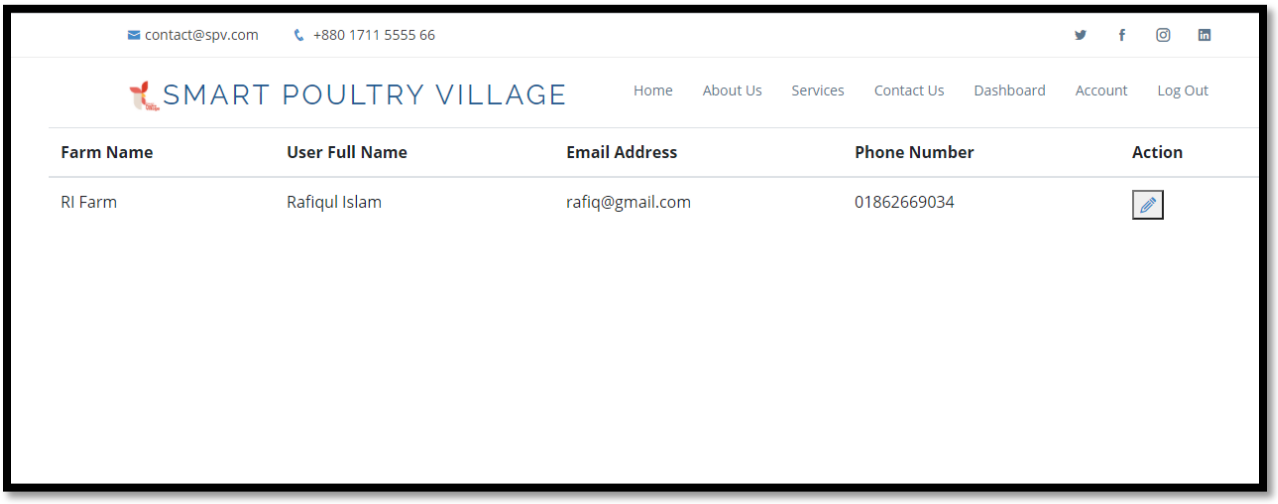


Figure 63: User can see their details information after accessing to the system.

No of Test	Action	Expected Result	Final Result
02	User can submit chicken purchase form, chicken mortality form and chicken sale for. And generate reports for chicken purchase, chicken mortality and chicken sale.	User can manage chicken by using the system.	As expected,

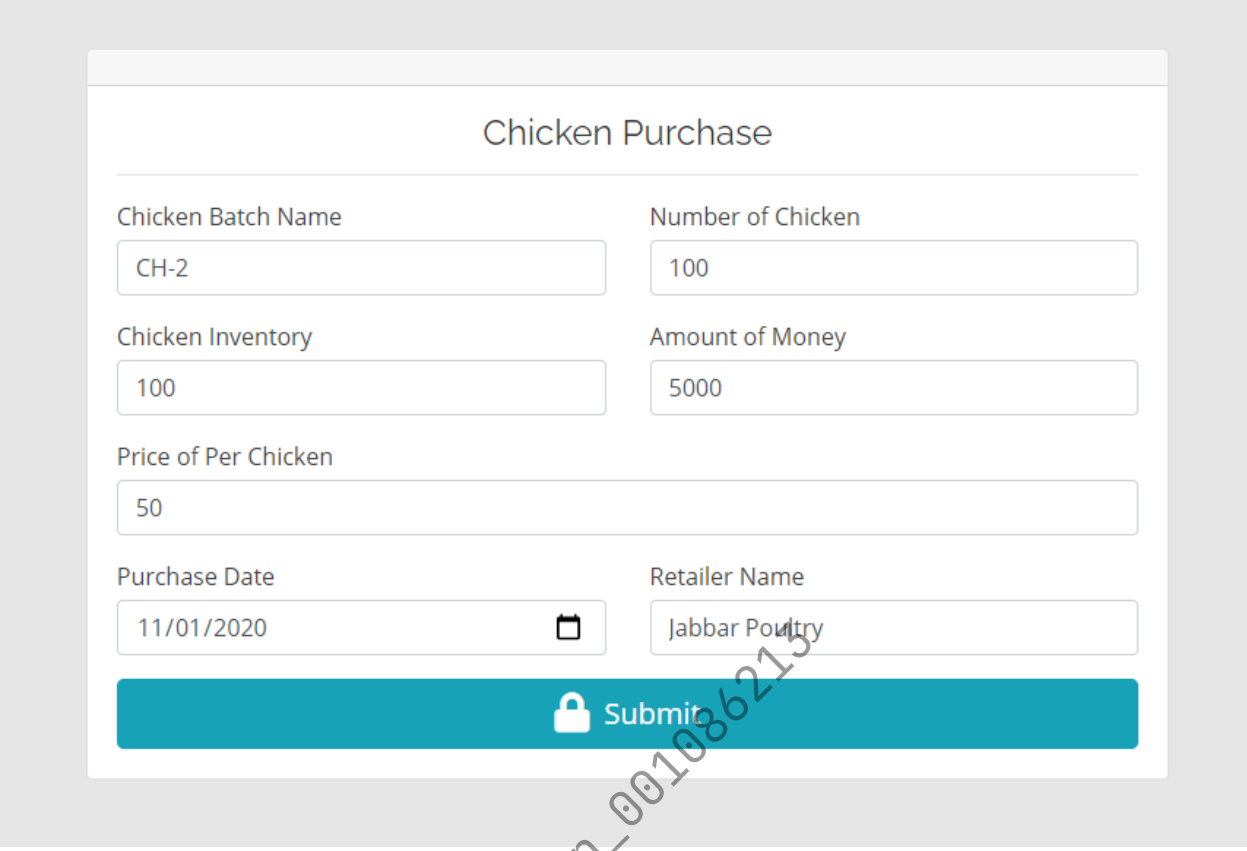


Figure 64: Chicken Purchase form.

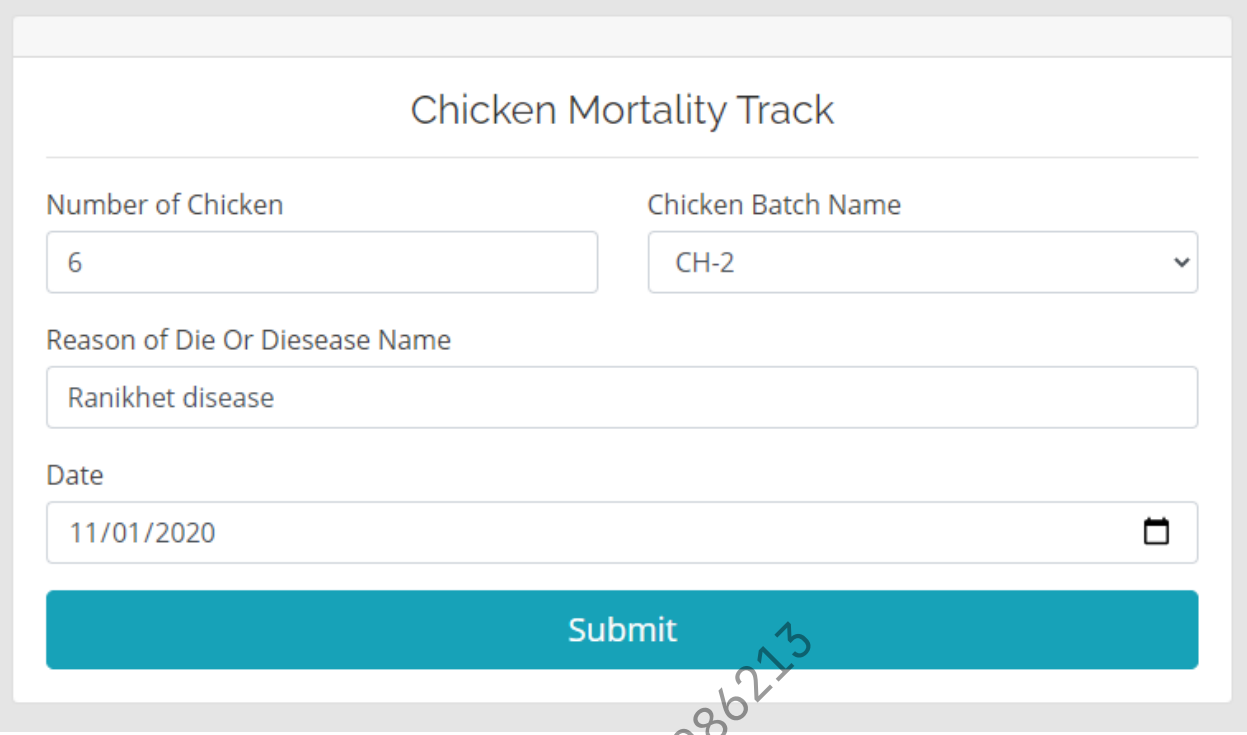


Figure 65: Chicken Mortality form.

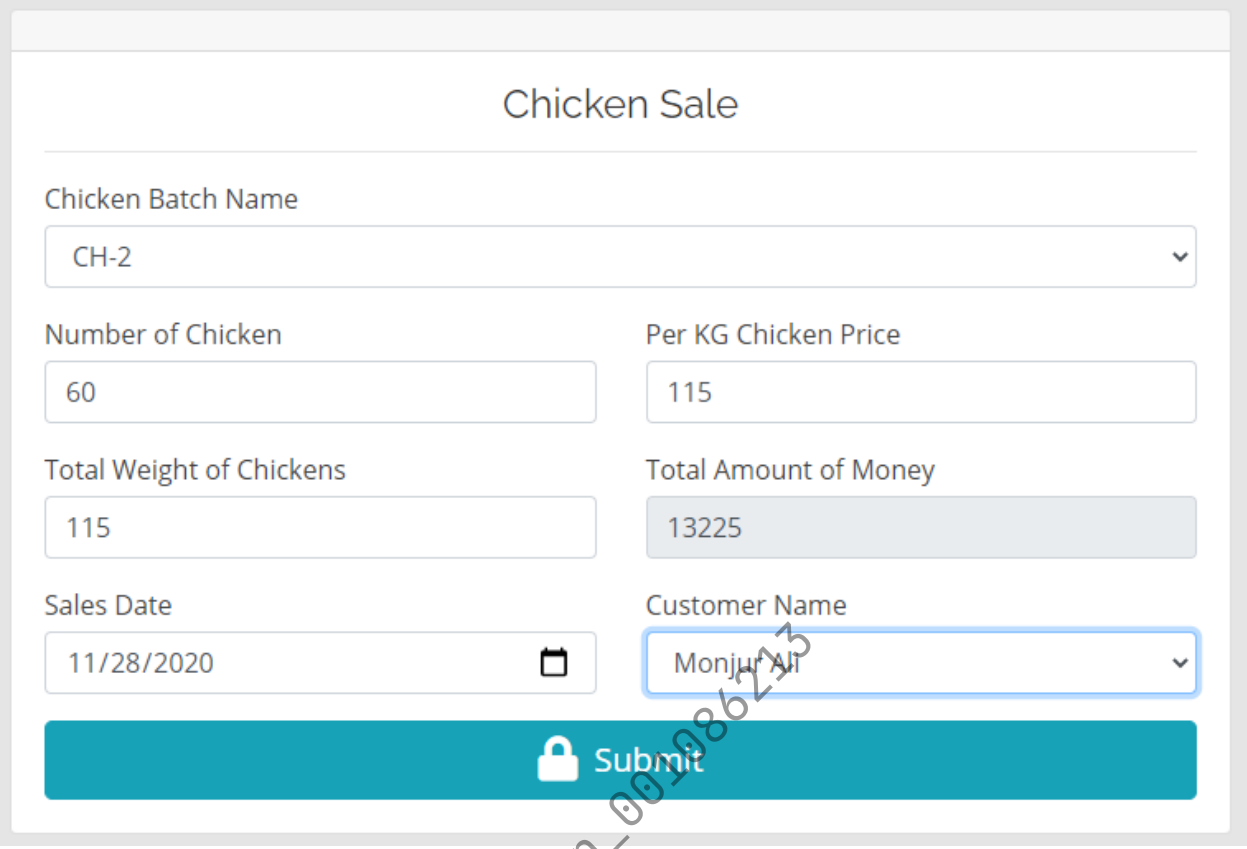


Figure 66: Chicken sale form.

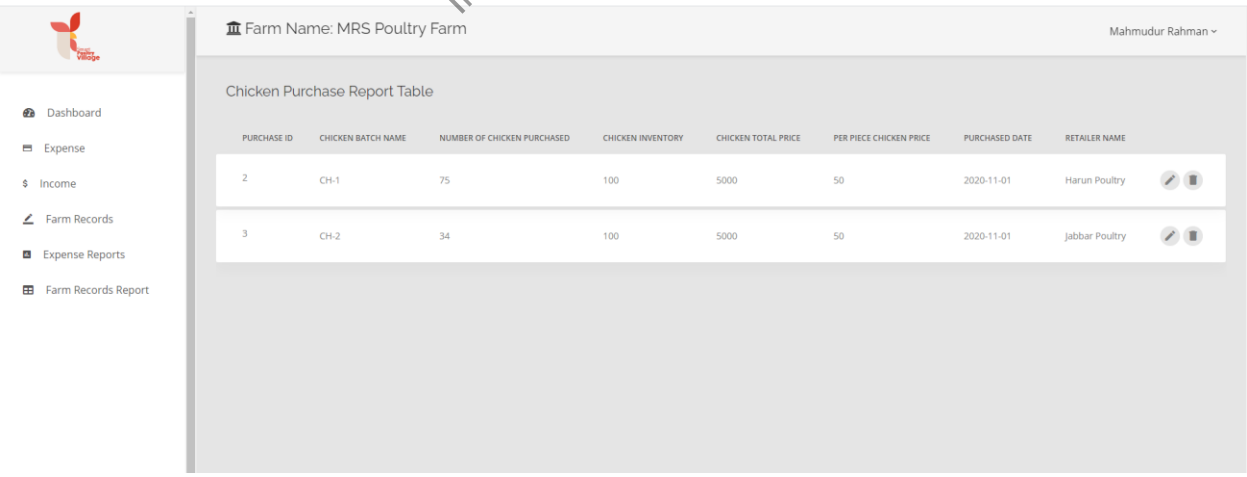


Figure 67: Chicken purchase report.

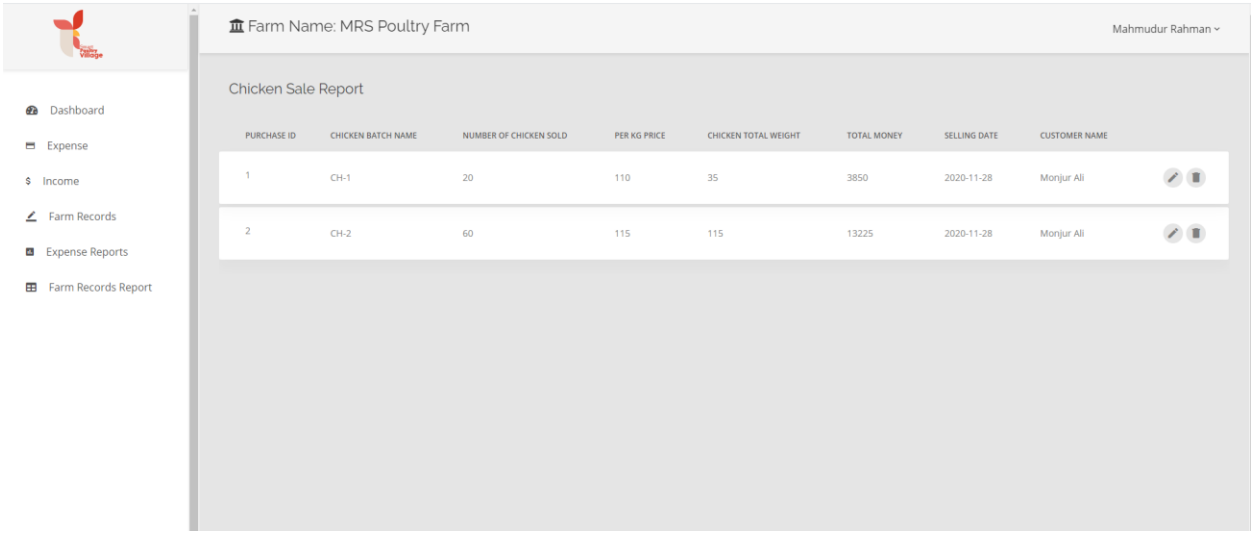


Figure 68: Chicken sale report.

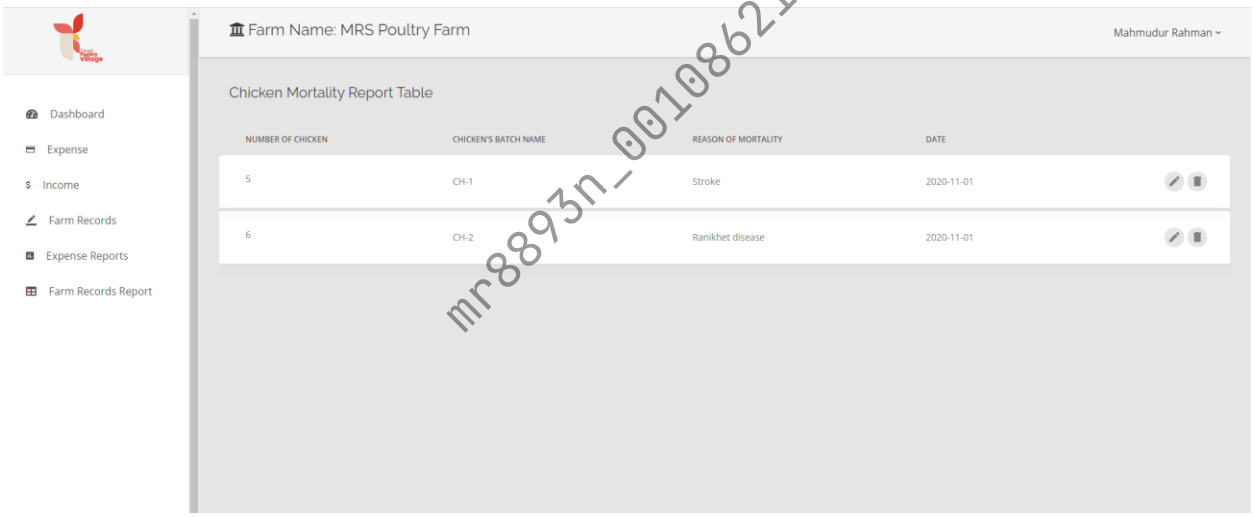


Figure 69: Chicken Mortality Track report.

12.2.4 Acceptance Testing

No of Test	Action	Expected Result	Final Result
01	After registration to system user can see their details by clicking account in the navbar.	User can see their provided details in a table.	As expected,

Figure 70: After Clicking Account user can sees their information.

No of Test	Action	Expected Result	Final Result
02	User see chicken batch wise report generate automatically by	User can see their Chicken Batch details in a table.	As expected,

	clicking Chicken Batch Details.		

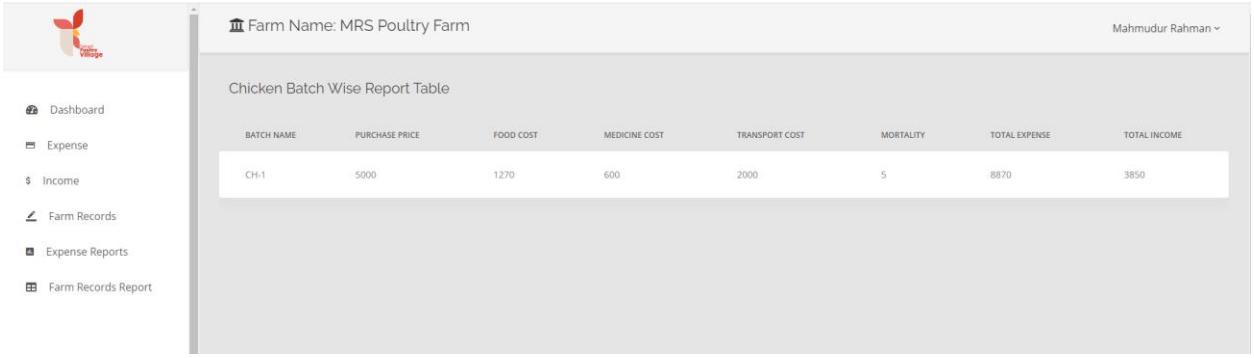


Figure 71: Chicken Batch wise report shown.

12.2.5 Performance Testing

No of Test	Action	Expected Result	Final Result
01	Run the application in Chrome	Runs the application smoothly and all things works perfectly	As expected,

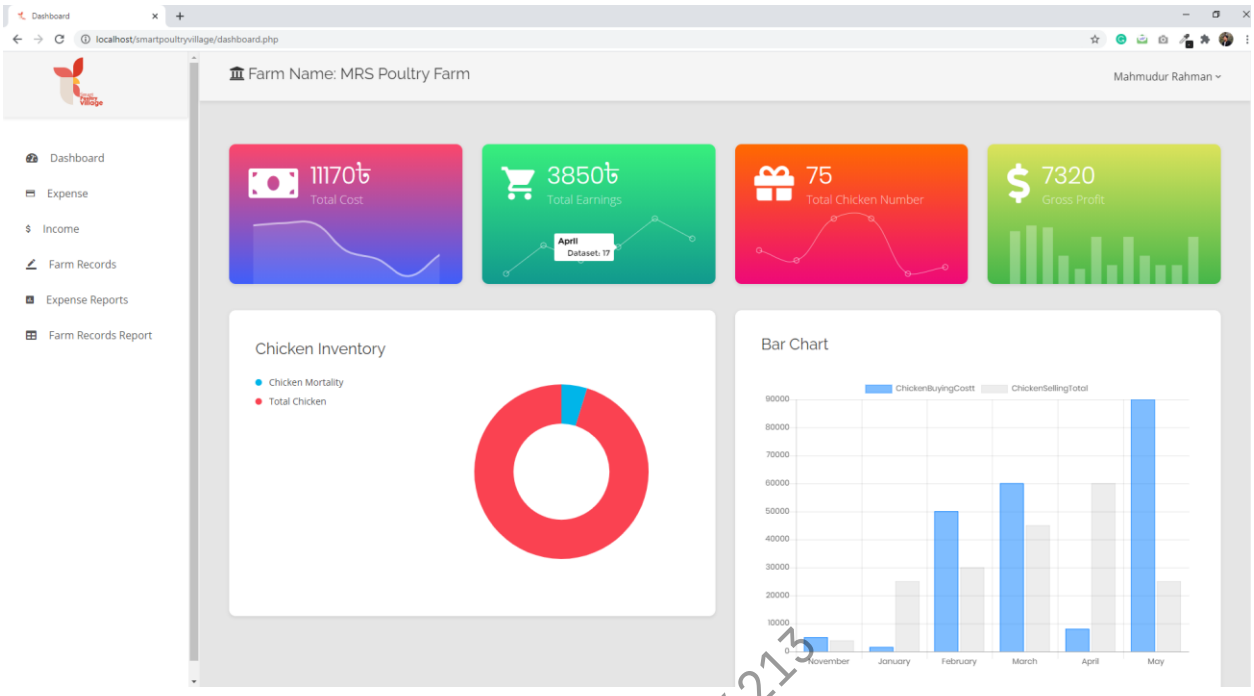


Figure 72: Runs on Google Chrome Perfectly.

No of Test	Action	Expected Result	Final Result
02	Run the application in Microsoft Edge	Runs the application smoothly and all things works perfectly	As expected,

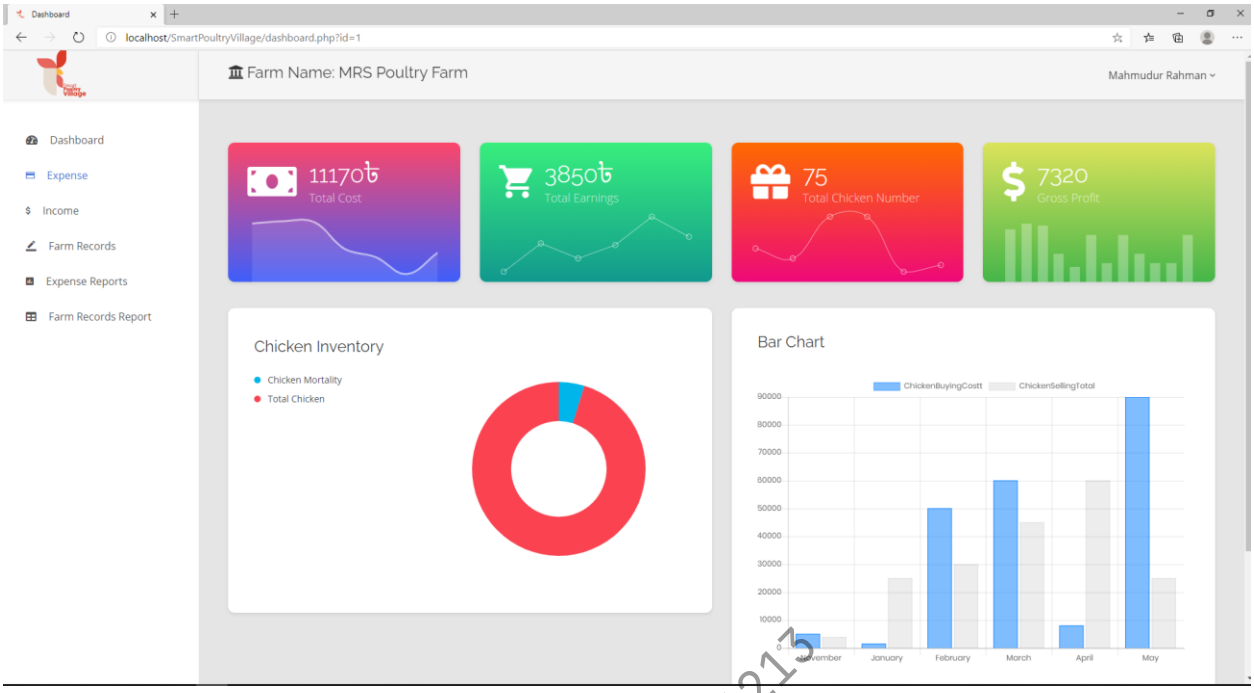


Figure 73: Runs on Microsoft Edge Perfectly.

12.2.6 Security Testing

No of Test	Action	Expected Result	Final Result
01	User need to register to the system by providing information beside providing a strong password.	Password will be stored in database in encrypted way.	As expected,

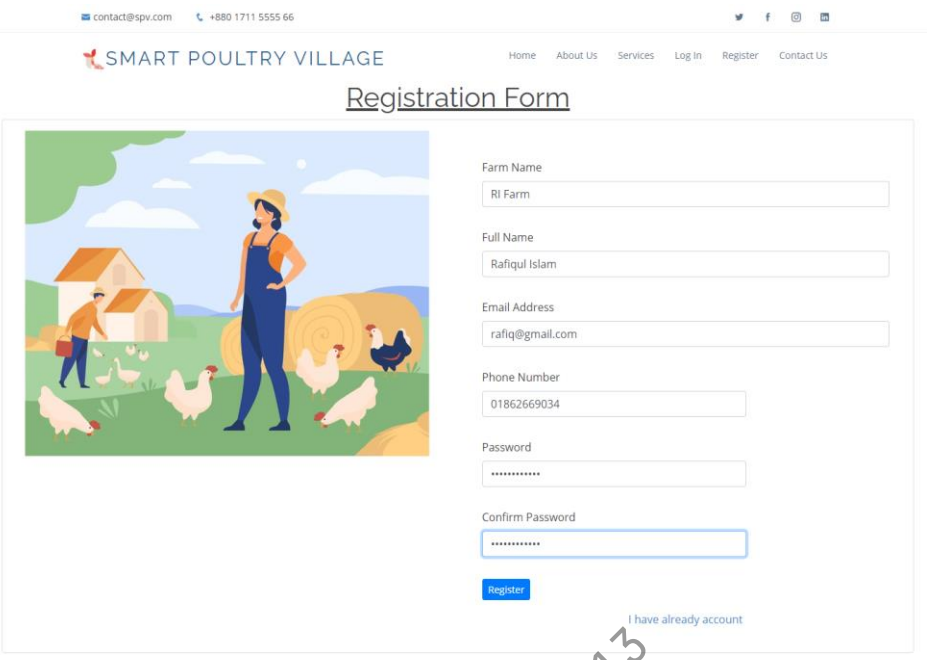


Figure 74: Provided information beside a strong password.

←T→	id	farm_name	full_name	email_address	phone_number	hashed_password
Edit Copy Delete	1	MRS Poultry Farm	Mahmudur Rahman	mahmud@gmail.com	01521255051	$2y$10$yXFb5hFW60q4m/IRrELzLeIG8QH/AdDqEWilhajD0p3...
Edit Copy Delete	2	RI Farm	Rafiqul Islam	rafiq@gmail.com	01862669034	$2y$10$1SWvAgiMl.Lw3/Lh2sL5SePCImaBNZrlcsjXIHaXqz2...

Figure 75: Password stored in database in encrypted way.

No of Test	Action	Expected Result	Final Result
02	Providing Invalid email and password will not be accepted by the system.	Shows up error message for invalid email and password.	As expected,

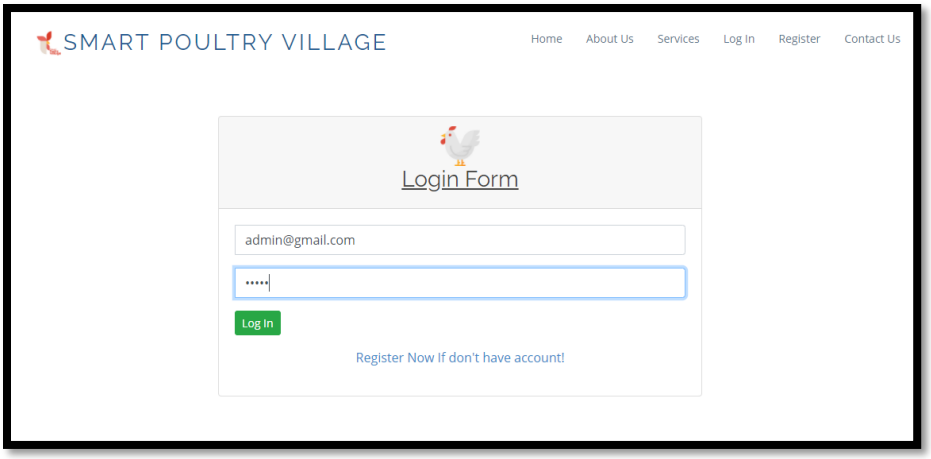


Figure 76: Providing wrong information in login form.

Figure 77: Error message shows up for invalid email and password.

12.2.7 Usability Testing

No of Test	Action	Expected Result	Final Result
01	User click Navigation link **Log in** and it will take to log in form.	After clicking Log in links it takes to log in form page.	As expected,

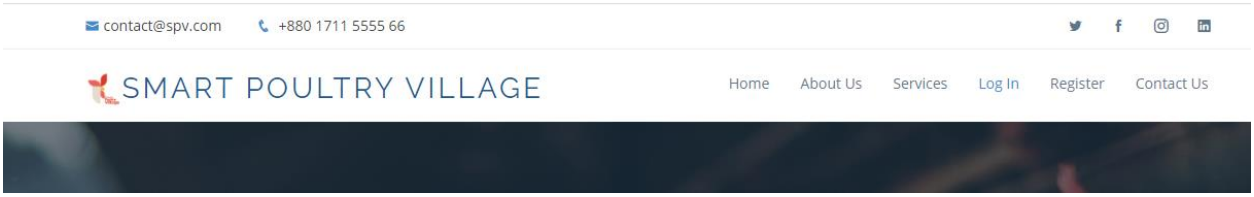


Figure 78: Navigation link Login before click.

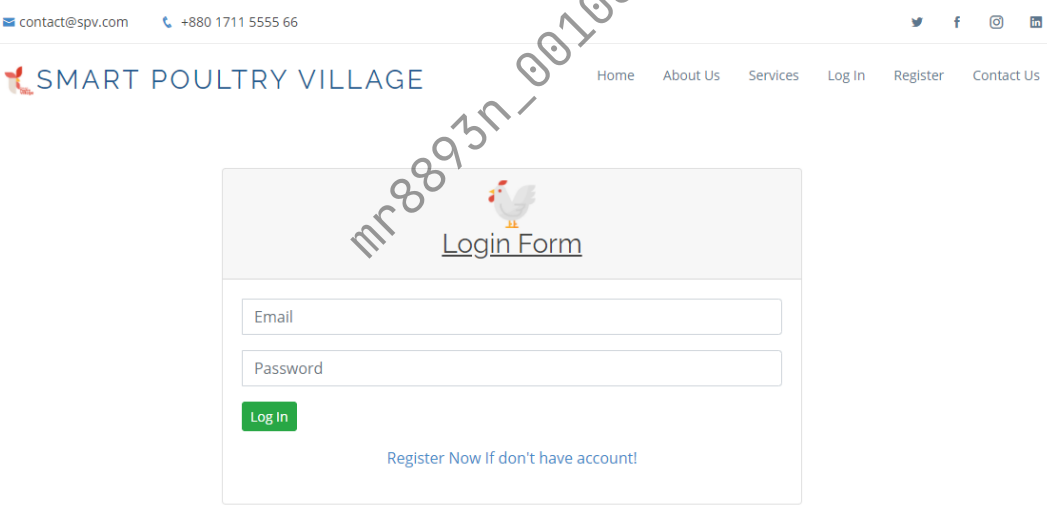


Figure 79: Takes to the navigation Form.

12.2.8 Compatibility Testing

No of Test	Action	Expected Result	Final Result
01	Run the application in PC.	Runs the application smoothly and perfectly.	As expected,

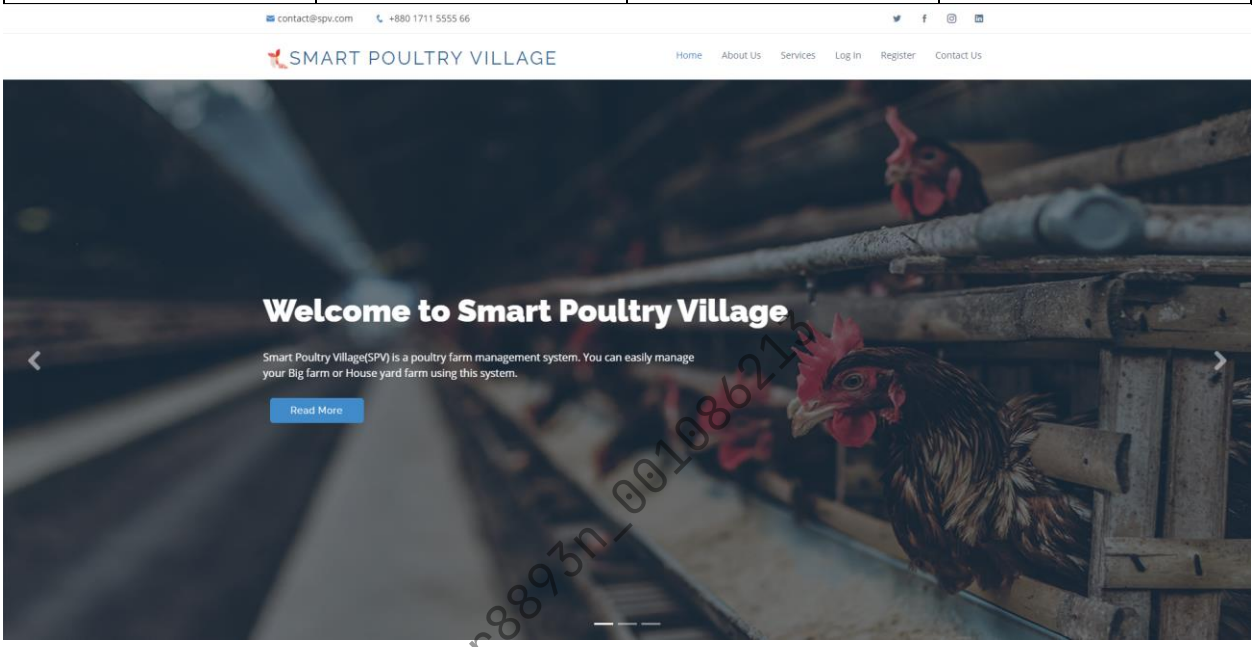


Figure 80: Runs smoothly in pc screen.

No of Test	Action	Expected Result	Final Result
02	Run the application in Mobile.	Runs the application smoothly and perfectly.	As expected,

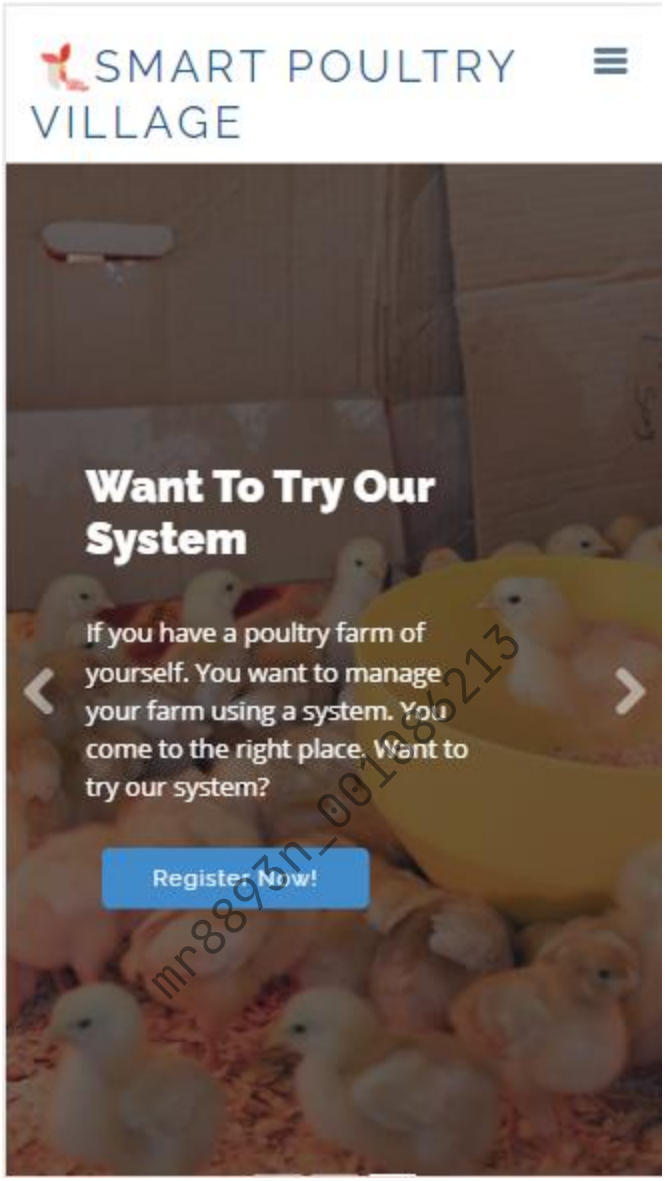


Figure 81: Runs smoothly in Pixel 2 Smart Phone.

More testing is provided in **Appendix – G**.

13. Deployment

The steps or process which is required to run an application and operate in a specific environment. (Williams, 2020). Deployment can be carried out in two ways manual or automated system. Deployment is mechanism through which developer deliver applications, module, updates and

patches to the user. For successful deployment of the application there need to follow some criteria that will be discussed in the upcoming section.

13.1 Criteria for successful deployment

After development the developed system need to be deployed. And deploying a system is not easy there are some criteria to follow for a successful deployment of the system. For poultry farm management system successful deployment will be done by following some criteria. That criteria are discussed below:

I. Choose cloud base service.

II. Scale the Application.

III. Give thought to Application State.

IV. Choose a database server.

V. Use REST-based web services.

VI. Implement continuous delivery and integration.

VII. Avoid vendor lock-in.

VIII. Develop locally or in cloud. (Shipley, 2018)

13.2 Steps for successful deployment

Deployment of software is not an easy task. If system is not deployed successfully than the developed system will not come in any task. For deploying system successfully there are some steps need to follow. So, for successful deployment of poultry farm management some steps need to be follow. Those steps are discussed below:

Preparation

In this stage developer will gather all the code that need to be deployed. Beside this developer will gather libraries, configuration files or resources for the application. Host server in configured and running smoothly should be verified by the developer.

Testing

Developer should review the results and correct any type of bugs and error before deploying the system in live environment. And before deploying system should be tested in test server by developer.

Deployment

After testing and check for bugs developer should deploy the system in the final server and update the database using some scripts. Deploy the system in a web server to live for the user. (sumologic, 2020)

13.3 Deployment Method

Deployment method is a method followed to deploy the system in the cloud or in server. There are lots of deployment method. Among those Blue-Green deployment has chosen for deploying the developed system. Blue-Green deployment is a technique of deploying any application to the web by reducing down town and running two similar production environments. (cloudfoundry, 2020) For deploying the developed system there are some steps in Blue-Green deployment method those steps are given below:

Configure Blue and Green Web Server:

For deploying the application firstly, it needs to configure two server one is Blue and another in Green. Where two environments will be deployed.

Setting up deployment to the Blue and Green Web Servers:

Then the configured server needs to set up for deployment of the application. Here all the required command needs to give for setting up the Blue and Green servers. And push the application to the servers.

Configure key to access the Blue and Green Server:

For accessing to the server generate Key like password to access the servers.

Configure remote access on the local development machine:

After getting key to access to the server a remote access needs to create to control the servers and to monitor the servers. And for continuous update of the servers from remote local computer reducing downtown of the environments.

13.4 Training

Training is teaching others for any skills or type of behavior. After Deployment of the system the user who will be using the system need to be trained for using the system. As the system is developed for managing a poultry farm. Before it was traditional way to manage the farm by writing in the paper. Now the managing farm will be in digital way so user of the system will be not familiar with the system. So, user need to trained for using the system. Before using the system, user have to be trained for using the system.

Firstly, user will be trained for system access how user will register the system. What information need to be provided. How to access to the system providing some private information which cannot be shared. How to update information of user. All the system access related training should be given first.

In this part of training user will be train to use the system. What activities user can do by using this. How user can manage user's farm using this system. All the activities that the system carried out all the activities would be trained to the user.

13.5 Data Migration

When there is no existence of this developed system than all the data of farm are stored in paper. There stored lots of data and that data are stored in paper for this reason some data may lose. But after implementation of the system all the data will be stored in the database. Data will be stored digitally in a secure place. Where there will be no chance of losing data. So, it is important to migrate all the data of past to store in the database. Which will ensure data security and prevent data lose. Migration of data will take much time but it will be beneficial for the organization for storing data securely. This data could be analyzed by the new system and helps user to take decision for the organization.

14 Evaluation

Evaluation is a process of judging something's quality, value or a report that has information. Evaluation of the system is judging its efficiency and finding any improvements required to the system. For getting better quality system evaluation is must needed technique to judge the system.

14.1 Project Evaluation

Project Evaluation is a systematical assessment of a completed project. It is carried out to determine if the developed project achieved its objectives, effectiveness, efficiency, impact and sustainability. Project evaluation process is collecting data for the project and analyze them with the outcome of the project. For doing project evaluation there are some steps and that steps are discussed below:

Planning

In planning phase, the first and foremost work for evaluation of project is prioritize short- and long-term goals. Beside this method of collecting data will be determine in this section. Stakeholder will also be declared in this phase. To know the actual objectives and goal some questionnaires will be asked to the stakeholders. This above work will be carried out for the evaluation plan of this project.

Implementation

In this phase full evaluation plan will be carried out. All the data collected for the evaluation will be analyzed assessing the developed system. The quality of the project will be measured by comparing with the prioritized goal. Stakeholders quaternaries answer expectation has fulfilled or not that will also be identified. For this project Quality measurement will be carried out in this section. And asses it meets all the goals and objectives that stakeholders wanted are fulfilled or not.

Completion

In this all the identified problem of the project will come out. And for the identified problem solution will also be identified by the developer. For this project evaluation all the identified or unreached goal will be identified in this section and their solution will be done as soon as possible.

Reporting and communication

And in final stage a report with the description of the project information will be generated. All the process and operation carried out for meeting the goal of the project will be written in the report. A report with all information will be generated for my project after completing all the evaluation task.

14.2 Product Evaluation

Product evaluation is assessing the produced product. All the business goal and requirements have meet or not by the produced product are identified by product evaluation. Error or bug of the system will be identified by product evaluation. If any changes required to the system this will be also identified by product evaluation. Product evaluation of produced product are discussed below:

14.2.1 Usability

Usability refers quality for user experience when user interacts with the products or systems. Usability is mainly satisfaction of user using the system and systems effectiveness and efficiency. Usability is using system seeing the logo, font, image and navigation user easily understand the purpose of using these items. So, in the developed system easy navigation system used so that by reading and seeing navigation bar user easily navigate one page to another. Using logo of different elements makes user easily understand what data stored here. And for this user will find it easy to use the developed system.

14.2.2 Learnability

Learnability is seeing the interface how quickly user can learn the action. Structure and interface of the product should be to understandable that by seeing the interface and using the product user can easily learn how to operate the system. As the system is web application. Interface need to be produced like other web application interface. So that by seeing the interface user assume and learn the work of it. Developed system have also developed by having similarity in the interface with other web applications.

14.2.3 Sustainability

Sustainability of product is the ability to exist in the environment constantly. For sustaining a product or system, software or product need to be maintained some criteria those are discussed below:

Copyright

For sustaining the system or application copyright is an important issue. If the developed product has no copyright rights than anybody could duplicate the product. In Bangladesh Copy right act 2000 and Copyright rules 2006 have guarantee legal protection to the software, web and mobile app. In the developed system's footer there is clear indication of having copyright right of the product.

Testability

For sustaining the software testability is another component. If the product is full of bugs and error than it will not sustain much time in the market. Testing should be done to the system. If bugs and error found in testing those bug and error need to be fixed. For this project different kind of testing have carried out to reduce bug and error for the product in **Section - 12**.

Maintainability

Maintainability is time required to fix the affected component of the product. Products or system performance need to increase. Quality of some components need to be increased. Changes need to make in the system for adopting new environment. All these works fall under maintainability. If product or software cannot maintain than it will not sustain. In the developed product a full details documentation has made so that product can be maintain in future if any function needs to update or efficiency need to increase.

15. Critical Appraisal

Critical appraisal is a method of assessing the achievement of objectives of any project. In this section the business need that identified for meeting business value have achieved or not will be find out. How much business objectives are met which are not met all will be identified in this section. The strength and weakness of the developed system also identified in this section. The upcoming section will briefly discuss about these topics.

15.1 Objectives Met

The defined objectives of the project will be assessed. Among the identified objectives which have met the objectives that is identified in this section. Those met objectives are given below:

- A web-based web application for managing poultry farm is developed.
- User can register and login to the system.
- Use can manage chicken.
- User can manage Food.
- User can manage Medicine.
- User can manage customer.
- User can manage employee.
- User can manage other expenses.
- User can generate report for loss and profit of the farm.

15.2 Objectives Partially Met

There are some objectives those are partially met those will be discussed in this section with reason.

- User can manage employee.
- User can manage customer.
- User can generate report for loss and profit of the farm.

These objectives met the goals partially. These objectives are individually a huge module for the project. Completing these modules in limited time is impossible. The whole modules all functionalities are not identified. Some functionalities have identified and those are developed for this project. For that reason, these modules met objectives partially for the project. These modules all objectives goals will be met fully in further development phase. All these modules will be developed fully in the further development phase.

15.3 Objectives totally not met

There are some objectives those are totally not met those will be discussed in this section with reason.

- User can manage other expense of the farm.
- User can manage egg production of the farm.

These objectives totally not met the goals. These objectives are individually a huge module for the project. This project is academic project. All the works and development are done by myself alone. Completing these modules in limited time and doing alone is impossible. For that reason, all these objectives are not met. For meting these objectives more time and team is needed. These modules all objectives goals will be met in further development phase with more time duration and supporting team. All these modules will be developed fully in the further development phase.

15.4 Features that were touched

- Online Registration and login system.
- Generate Reports.
- Digital data input process.
- Generating cost and expense report.
- Inventory Management.
- Sale Management.
- Purchase Management.
- Generate charts.

15.5 Features that were partially touched

- Employee management.
- Customer management.
- Dynamic profit loss report generation.

15.6 Features that were not touched

- Online transaction process.
- Online order process.
- Online salary given process.

These features are not touched because this project is academic project. And in academic project there is time limitation to complete the project. Within this limited time limit these features cannot be developed. But these features can be developed in further development phase.

15.7 Strength of the system

- A user-friendly web application to manage poultry farm.
- Secure database to store data of the farm.
- Dynamic dashboard for the user.
- Auto generated report by the system.
- Detailed report of stored data.
- Well managed chicken sale management.
- Dynamic report generation of loss and profit of chicken.
- Less complex system to manage poultry farm.

15.8 Weakness of the system

- No backup system for the developed system are build.
- System does not have high quality security.
- System does not have online transaction process.
- System does not have online order process.

15.9 Further Development

Here what need to do to minimized all the weakness of the system and some required features that need to be developed further will be discussed below:

- Chicken customer will be able to order chicken online.
- All the payment of order and employee salary will be given using online transaction.
- User able to manage the egg production of the farm.
- Backup system should be developed for the system.
- Security of the system will be increased.
- User able to manage employee, customer and other expenses of farm more efficiently.

16 Lesson Learned

16.1 What I have learned

This academic project taught me lots of things. I have learned many things from the beginning of the project till the finishing part of the project development. First thing I learned from the project is efficient researching. Before starting the project, I need to find out in which problem domain I can develop my project system. I have researched many problem domains to decide which I can take for my project problem domain. After long time research I found problem domain of managing poultry farm. After identifying the problem domain for the project, I started research and analysis for identifying the business goal of the farm. I have researched and analyzed lots of literature review for understanding the existing system and worked section of the problem domain. I visited few farms and meet some farm owner to understand the business logic and to know business goal. And by this I have identified business goal and logic for my developing system.

Then after identifying problem domain and business goal I have researched some existing system to identify their best feature. Beside this to know the limitation of the existing system. From existing system research, I identified which feature I need to develop and how I can provide a good feature system for fulfilling the problem domain's objective goal.

I learned applying development methodology for developing my project. Without applying development methodology, a successful project cannot be developed. I have research some developing methodology and I have chosen a methodology for my project development which suits best for my academic project. This methodology helps me to break down all the development work. And using methodology I can easily track my development work progress. This methodology also helps me to identify business goal and helps me to gather necessary requirements to fulfill business goal of the developing project.

After this I have learned effective planning. For developing the project, I need to make a project plan to get the best outcome of the project and to finish the project in time. In planning section, I made project plan, test plan, risk management plan, quality management plan, plan to use methods and tools for the project. I have learned how to plan for developing each feature work of the project by allocating time. I learn to plan for the risk management. How to identify risk of the project and how to manage that risk taking some action plan. Changes can be essential in development I learned how to add changes during development phase if any changes required to the system.

I learned how to analyze requirement of the project effectively. I have to draw rich picture, use case, ERD, sequential diagram to understand the workflow of the project. I have learned how to gather requirement for the system. And learned to prioritized the gathered requirement using prioritization tool. And learned to draw diagram like Entity relationship diagram to understand database table relations by applying UNL notation. Deployment diagram, class diagram and component diagram to understand the architecture of the developing project.

Then I have learned how to develop the system. I have learned If any problem arises how to handle that problem by using some methods like iterations. I learned about development

technique. After development I have learned testing the code and feature are working correct or not. For this I created test plan and teat case. I learned how to execute test plan and test case. I conducted those teat plan and test case for all the feature of the system.

Lastly, I learned how to evaluate the developed project. I have learned how to evaluate a project. And for evaluating the project I have learned some methods which use for evaluation and learned how measure the product after some criteria.

16.2 What problem I have faced

For completing the project, I have faced lots of problem. From the beginning of the project I faced problem in literature review. I was unable to find out literature review for my particular problem domain. It was difficult part in writing documentation for the project. I have faced problem to identifying the business goal and finds difficult to provide solution for the business goal. In planning I have faces much problem. As the project I academic project planning for the project was much difficult. It was most challenging and difficult to develop this kind of project by alone. After developing all the features and testing each feature by myself alone was most difficult work for the project.

16.3 What solution occurred

Every problem has its own solution. As I have faced problems for developing the project from the beginning till end. Beside I have managed and find solutions for that problems. In searching literature review I searched more and more literature review and research article for the problem domain. I have researched different existing solution and I visited some farms to understand business goal and how they wanted the solution for this particular problem domain. I have planned all the task properly for managing the development process in time. I have break down the task and allocate that task in a particular time box providing time limit. In development phase I have allocated time boxes for specific features with time limit. And this helps to develop the features

when time box was executed in given time duration. After completing the development of each feature, I made test plan for the developed features. I have executed all the test plan for the developed features. By this I have overcome all my faced problem in developing the system.

17 Conclusion

17.1 Project Summery

After completing the project Smart Poultry Village is a web application where a poultry farm daily activity can be managed digitally and efficiently. And all the traditional work process of the farm is transferred to digital process like managing chicken, food and medicine. Tracking chicken, food and medicine inventory. Generating report for the loss and profit of the farm. For developing the project, I have used DSDM methodology to develop the system. It is an academic project for that reason all the task of developing system is my myself. I have analyzed system to gather information and to identify requirements for the system. I have performed all the necessary steps like data gathering, requirement analyzing, requirement prioritizing, development, testing, evaluation for successful project development. In the developed system there is one role which is user or farm owner. User can access to the system by registering himself/herself for managing his/her farm. And get access to features of the system and can manage farm easily and effectively.

This is an academic project where there is a time limitation for developing the system. I tried my best for fulfilling and building all the features that meets the business goal and objectives of the problem domain in the given time.

17.2 Goals of the project

In Bangladesh poultry industry is a growing industry. It has a great economic growth from the past 10 to 12 years. All the farm owner uses traditional process to manage the farm. That's why they cannot manage the farm properly and cannot earn profit as expected. As everything is going

digitalized and automated. Thinking about the future of poultry industries and thinking about the poultry farmers I tried to develop a system by which they can manage their farm easily and digitally. And putting the aim of managing farm digitally I made some business goals and objectives and within the limited time I tried my best to meet all the goal and objectives.

17.2.1 Fulfilled goals of the project

- Develop a web application for managing the farm.
- User get easy and user-friendly system to manage the poultry farm.
- User can manage chicken, food, and medicine for the farm.
- User can calculate and generate report for the loss and profit of the farm.
- User can manage transportation cost, employee, other expenses and chicken customers for the poultry farm.

17.2.2 Goals are not fulfilled

- User cannot manage employee and other expenses of the farm fully.
- Online transaction process is not present in the system.
- Online order of chicken is not present in the system.

17.3 The success of the project

Success of project lies on the how much goals and requirements are met for the project. This project is academic project. And in academic project there is limited time duration to complete the project. But I tried to meet all the major requirements of the project. The developed system is a web application to manage the poultry farm. I developed all the major functionalities to met the objectives and goal of the project. By using the developed system user can manage their farm. They can manage the chicken, chicken's medicine, chicken's food and transportation cost. Beside

this user can manage employee, customer and other expenses of the farm. User can generate report for loss and profit of chicken. But using system user cannot do online transaction for the chicken sale and buy. Customer cannot order chicken using the system and egg production cannot managed by the system. So those requirements are not fulfilled yet I will try to develop those in further development.

17.4 What I have done in documentation

Documentation is a mandatory work of academic project. For the developed system of academic project, I have done a documentation for the project. All the work of project from first to last all steps I have documented. In the beginning of the project I have provided project proposal where I have described about the aims and objectives of the projects. Then I have identified all the problem areas of current solutions. Then researched journal and articles for gathering information for the project. And by analysis and research of the information I have completed literature review section. This helps to gather more relevant requirements for the system. The after completing literature review, I have researched three leading existing system where I identified their best features and limitation of the system. Which helps me to know which weak point need to improve in my system. Then I identified and describe legal, ethical, social and professional issue that may arise for the failing of the system. Then I have done the most important task of the project that Is planning. I have made test plan, project plan, risk management plan, quality management plan. By completing this section, I described all the methodologies of project development. For developing my system, I have used DSDM methodology. I discussed about the requirements gathering tools and technique in the next section. Feasibility study and analysis cost benefit of the system discussed next. After this section I discussed about requirement analysis where I identified the requirements and prioritized all the requirements using some methods. In the next section I discussed about the system design architecture where I have provided diagram like rich picture, use case, component and deployment diagram. Then I provided ERD and data mapping

for the system database. Then I have reviewed the technology that I will use for developing system. After that I discussed about development phase how I develop the system. Then testing phase where I have carried out some testing like unit testing, integration testing module testing. And finally, I have evaluated my developed system.

17.5 My experience

It was a fantastic experience for me developing this kind of project all myself. It was an academic project but it is almost a real-life project. There are lots of good and bad experience by developing this project. Good experience was I learn good time management. In the limited time I have completed my project. I learned lots of things like planning, analysis, deployment, development and testing. I learned how to handle situation. I learned to use technique and method for solving problems. But the bad experiences also when I got any error in code while development, I got so depressed. But I don't lose hope. I tried to solve the problem. And at last I have completed the project successfully.

17.6 Future Implications

All the requirement objectives of the project may not fulfill. But major requirements are fulfilled for the system. I successfully completed the project. I learned many things from the project development work. But there are lot more that need to learn for myself. I need more experience like this to develop my skill. I need to gain more knowledge for myself. I need to be more skillful so that in future I do not develop any system without fulfilling all the requirement.

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18 Appendices

18.1 Appendix – A – Project Proposal

Smart Poultry Village

Introduction:

The problem domain for the project is Poultry Farm Management. Where all the works of a poultry farm will be managed by the help of a web application. This problem domain fit in boarder of computing using the computer software and hardware for the purpose of reaching a goal by managing all activities of a farm. (Techopedia, 2019) There are many researches on this topic there also have a plenty of web application on this problem domain.(Bimoljit, 2015) All are developed to minimizing the paperless work, manage all records of different section and shown the report of individual record. (B.V., 2019) After researching in this problem domain some feature can help in the production of poultry farm. Analyzing the recorded data monthly statistics can generate. Profit and loss in monthly basis. So, in my research project I am going to work with the problem domain of poultry farm management.

Research aims and objectives

The aim of the project is to increase the productivity of a poultry farm by managing of all activities carries out in the farm and using the recorded data.

For achieving the aims there will be multiple SMART objectives. And that objectives need to be chosen considering the objective is specific. That can be measurable while developing, which indicates when it will be achieved. Objective must be agreed by the supervisor. It has to be realistic so that it can directly contribute in project outcomes. And each objective has time bound. And the objectives for this project are:

i) Research about the problem domain for understanding what is existing and what need to be improved. A research report will generate on this work.

ii) Design the system for developing the application on research report. Which will help to get idea about how the application will look like. Design all the diagrams related to the database which will help to create database of record for each sector farm. And helps to make statistics using data from database.

iii) According to the prototype now coding should be implemented for developing the project. Beside database creation and query should be implement by writing code.

iv) Evaluating all the code for fulfilling project needs. How user-friendly and secure the application have developed need to be evaluated here.

The summery of the objectives with method deliverables and time duration are provided in **Appendix – A**.

Research approach

For this project DSDM methodologies will be applied for managing the whole project. And for reaching the aims of the project there need to carry out some objectives. Like Researching on similar application, literature review and analyzing data a requirements report can be generated. By Design objectives according to the requirements all system diagrams will be drawn and from system diagram database diagram will also be drawn. From all the diagrams the system will be developed. With the help of system diagrams and database diagrams system need to be developed. And lastly developed system will be evaluated by using unit test, security test and many more.

Planning

First of all, I will research for the identified problem domain. I will analyze the business process of the poultry farm. Then I will design the YI of the system. Then development of the project will be started. After completing the development, I will test the developed system for finding any bugs and error in the system. For my planning I have created a Gantt Chart that are given in **Appendix – B**.

Legal, Social, Ethical and Professional Issues and Considerations

Developing the web application many legal, ethical, social and professional issues may arise. Legal issues like privacy policy law, copyright law can arise. So, if there is no use of user's information without their permission these issues can be overcome. Beside using data of customer without knowing them and when user access the website giving trojan or malware on their pc by providing link can arise ethical issues. No use of personal data and not providing

malware can help not to fall in ethical issues. Web application need to be secured so that hacker cannot hack the application and cannot hack user information. Hacked data or information of user can cause social issues if user get bullied with their information that got hacked. So, for minimizing social issues web application need to be secured. If any of the above discussed issues arises that it will arise professional issues while developing the application. So other issues need to be strictly checked not to occur professional issues. Besides this if any other issues arise strict steps should be executed for not happening.

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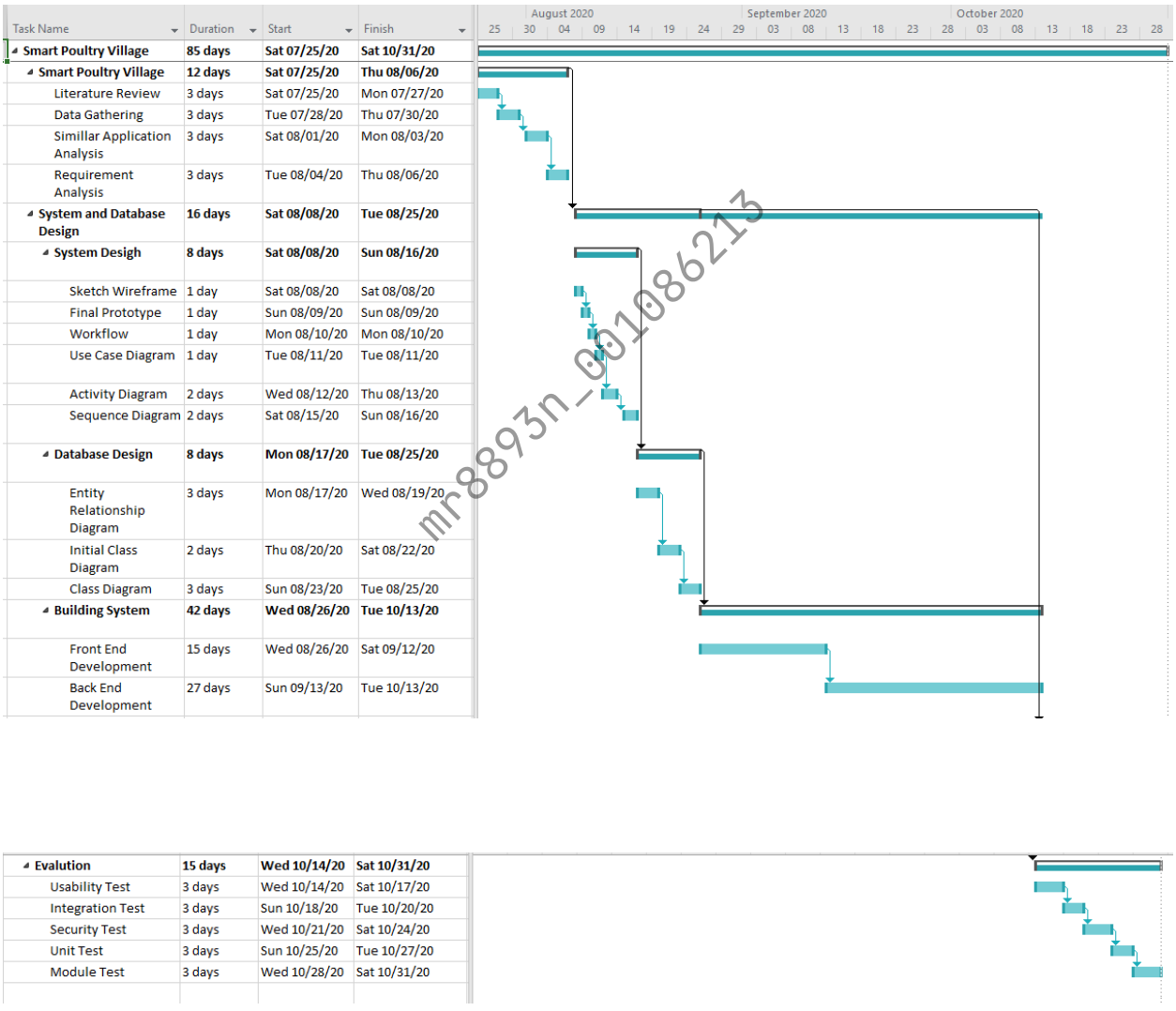
Appendix

Appendix – A

Objectives	Method	Deliverables	Duration
Research	Literature review, Data gathering, Similar application analysis and requirement analysis.	Research Report	2 weeks
System and Database Design	Visual design, Wireframe, Sketch, Prototype, Workflow, Use Case Diagram, Activity Diagram Entity Relational Diagram, Initial Class Diagram, Class Diagram,	System and Database design and diagrams.	2 weeks
Building System	DSDM Methodologies	Developed System	6 weeks
Evaluation	Usability Test, Unit Test, Module testing,	Testing Report	2 weeks

	Compatibility Testing, Integration Testing		

Appendix – B



Task Name	Duration	Start	Finish
Smart Poultry Village	**85 days**	**Sat 07/25/20**	**Sat 10/31/20**
Smart Poultry Village	**12 days**	**Sat 07/25/20**	**Thu 08/06/20**
Literature Review	3 days	Sat 07/25/20	Mon 07/27/20
Data Gathering	3 days	Tue 07/28/20	Thu 07/30/20
Simillar Application Analysis	3 days	Sat 08/01/20	Mon 08/03/20
Requirement Analysis	3 days	Tue 08/04/20	Thu 08/06/20
System and Database Design	**16 days**	**Sat 08/08/20**	**Tue 08/25/20**
System Desigh	**8 days**	**Sat 08/08/20**	**Sun 08/16/20**
Sketch Wireframe	1 day	Sat 08/08/20	Sat 08/08/20
Final Prototype	1 day	Sun 08/09/20	Sun 08/09/20
Workflow	1 day	Mon 08/10/20	Mon 08/10/20
Use Case Diagram	1 day	Tue 08/11/20	Tue 08/11/20
Activity Diagram	2 days	Wed 08/12/20	Thu 08/13/20
Sequence Diagram	2 days	Sat 08/15/20	Sun 08/16/20
Database Design	**8 days**	**Mon 08/17/20**	**Tue 08/25/20**
Entity Relationship Diagram	3 days	Mon 08/17/20	Wed 08/19/20
Initial Class Diagram	2 days	Thu 08/20/20	Sat 08/22/20
Class Diagram	3 days	Sun 08/23/20	Tue 08/25/20
Building System	**42 days**	**Wed 08/26/20**	**Tue 10/13/20**
Front End Development	15 days	Wed 08/26/20	Sat 09/12/20
Back End Development	27 days	Sun 09/13/20	Tue 10/13/20
Evalution	**15 days**	**Wed 10/14/20**	**Sat 10/31/20**
Usability Test	3 days	Wed 10/14/20	Sat 10/17/20
Integration Test	3 days	Sun 10/18/20	Tue 10/20/20
Security Test	3 days	Wed 10/21/20	Sat 10/24/20
Unit Test	3 days	Sun 10/25/20	Tue 10/27/20
Module Test	3 days	Wed 10/28/20	Sat 10/31/20

Figure 82: Gantt Chart for the project.

18.2 Appendix B – Breakdown of cost Benefit Analysis

Cost benefit analysis

It is a process that business takes to measure decisions. It can be obtained by adding the benefits of action and then subtracting the costs associated with taking that action (KENTON, 2020). As a result, the revenue of the system can be measured. The analysis of the two years of an organization during using the proposed system is given below,

1st Year

Cost sector	Quantity	Cost (BDT)	Total (BDT)
Personal computer	1	30,000	30,000
Operating system	1	14,500	14,500
Domain	1	7,000	7,000
Hosting	1	950	950
Maintenance	1	50,000	50,000
Training	1	20,000	20,000
Total			BDT 1,22,450

2nd Year

Cost sector	Quantity	Cost (BDT)	Total (BDT)
Domain	1	7,000	7,000
Hosting	1	950	950

Maintenance	1	50,000	50,000
Total			BDT 57,950

18.3 Appendix – C Full Description of Each Interview

Interview with Farm Owner

Questions

1. What is your business goal?
2. How you want we might meet your business process?
3. How you will use this system?
4. What feature you want in your system to meet your business process?
5. What is your present business process?
6. How you want to replace your business process by using the system?
7. How system will increase your business value?
8. How system will minimize your work?

18.4 Appendix – D – Use case Descriptions

ID for Use Cases	Action by the Actor	Response of the system

UC – 06	User can manage Employee Salary of the farm by storing and generating report using the system.	System will enable user to manage Employee Salary of the farm by storing and generating report.
UC-07	User can manage Chicken Mortality of the farm by storing and generating report using the system.	System will enable user to manage Chicken Mortality of the farm by storing and generating report.
UC-08	User can manage Customer Details who buys chicken from the farm by storing and generating report using the system.	System will enable user to manage Customer Details who buys chicken from the farm by storing and generating report.
UC-09	User can manage Other Expense of the farm by storing and generating report using the system.	System will enable user to manage Other Expense of the farm by storing and generating report.

18.5 Appendix – E – Data dictionary

Data Dictionary

User

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference

id	INTEGER	10	YES	NO	
farm_name	VARCHAR	60			
full_name	VARCHAR	60			
email_address	VARCHAR	60			
phone_number	VARCHAR	12			
hashed_password	VARCHAR	70			

Chicken_Mortality

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
chicken_number	INTEGER	20			
batch_name	VARCHAR	50	NO	YES	
reason_of_die	VARCHAR	50			
date	DATE				

Chicken_Purchase

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
batch_name	INTEGER	20	YES	NO	

chicken_number	INTEGER	20			
chicken_inventory	INTEGER	20			
chicken_price	INTEGER	20			
per_price	DOUBLE				
purchase_date	DATE				
retailer_name	VARCHAR	30			

Chicken_sale

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
batch_name	INTEGER	20	NO	YES	
schicken_number	INTEGER	30			
per_kg_price	DOUBLE				
tchicken_weight	DOUBLE				
tamount_money	DOUBLE				
sale_date	DATE				
customer_name	VARCHAR	30	NO	YES	

Food_litem

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
food_name	VARCHAR	60			
food_unit_price	INTEGER	60			
adding_date	DATE				

Food_Purchase

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
food_id	INTEGER	10			
food_amount	DOUBLE				
food_price	INTEGER	20			
food_unit_price	INTEGER	60	NO	YES	
purchase_date	DATE				
retailer_name	VARCHAR	60			

Food_Given

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
food_id	INTEGER	20	NO	YES	
gfood_amount	INTEGER	20			
batch_name	VARCHAR	20	NO	YES	
given_date	DATE				

Medicine_Item

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
med_name	VARCHAR	60			
med_type	VARCHAR	50			
med_unit	VARCHAR	60			
med_unit_price	INTEGER	60			
adding_date	DATE				

Medicine_Purchase

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
med_id	INTEGER	10			
med_unit	VARCHAR	20	NO	YES	
med_amount	DOUBLE				
med_price	INTEGER	30			
med_unit_price	INTEGER	20	NO	YES	
med_pdate	DATE				
med_rname	VARCHAR	30			

Medicine_Given

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
med_id	INTEGER	10	NO	YES	
med_given_amount	DOUBLE				
batch_name	VARCHAR	50	NO	YES	
med_given_date	DATE				

Employee _Salary

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
employee_name	VARCHAR	40			
employee_address	VARCHAR	100			
employee_phone	VARCHAR	12			
Salary_amount	INTEGER	20			
given_date	DATE				

Customer _Details

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
customer_name	VARCHAR	40			
Customer_adress	VARCHAR	80			
customer_phone	VARCHAR	20			

Transportation

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id	INTEGER	10	YES	NO	
transport_name	VARCHAR	40			
batch_name	VARCHAR	60	NO	YES	
transport_cost	VARCHAR	20			
used_date	DATE				

Other expenses

Attributes	Data Type	Length	Primary_Key	Foreign_Key	Reference
id			YES	NO	
employee_name			NO	YES	
buying_reason					
element_price					
buying_date					

18.5 Appendix – F – Screenshots of final product

User

Registration Form

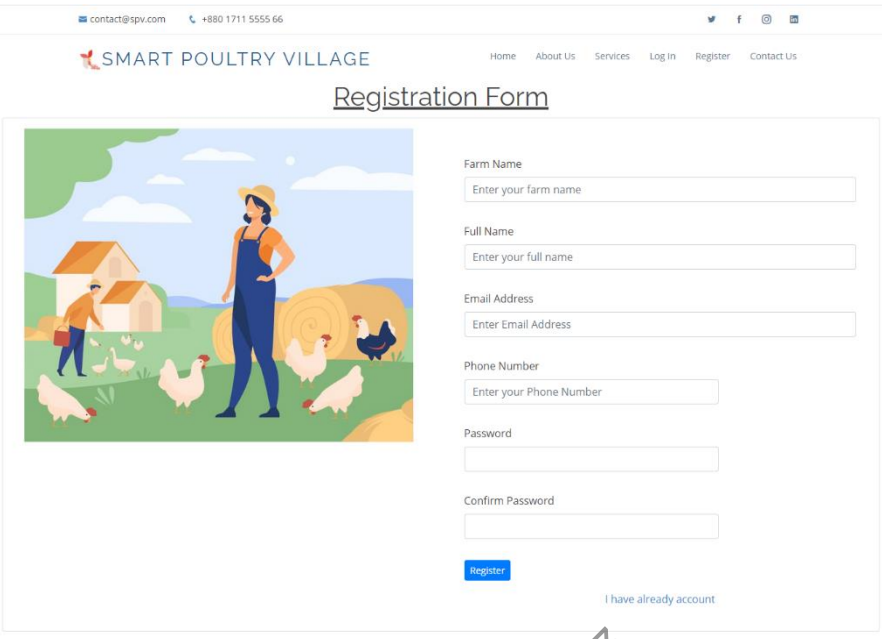


Figure 83: Registration form for user to register to the system.

Log in Form

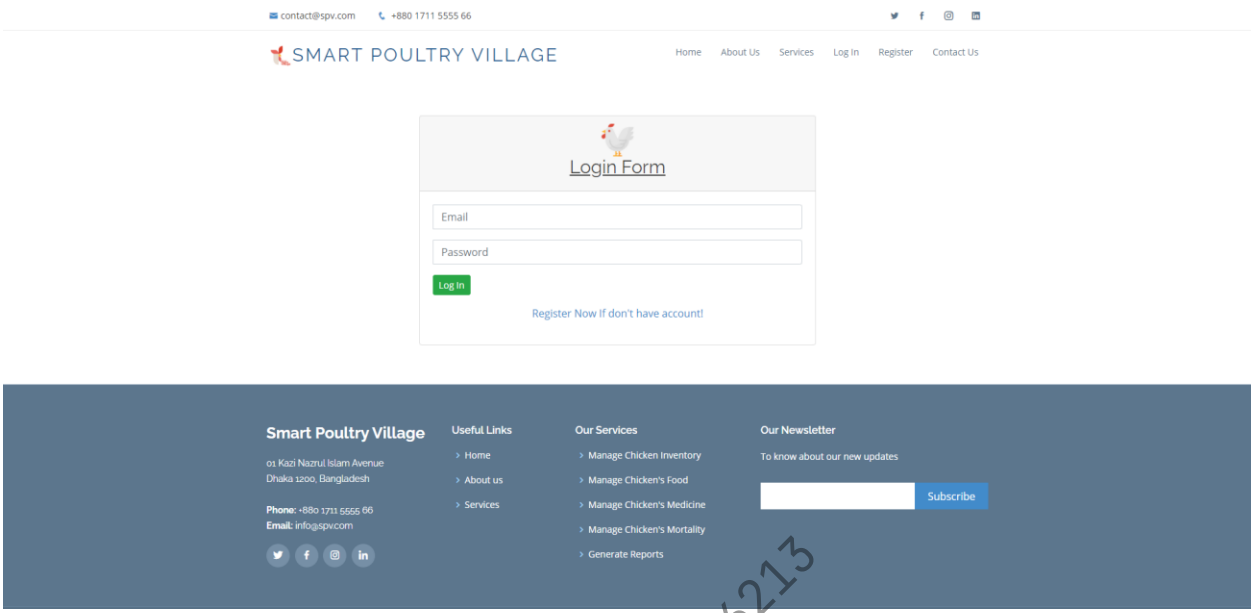


Figure 84: Login form for user.

User Details Page

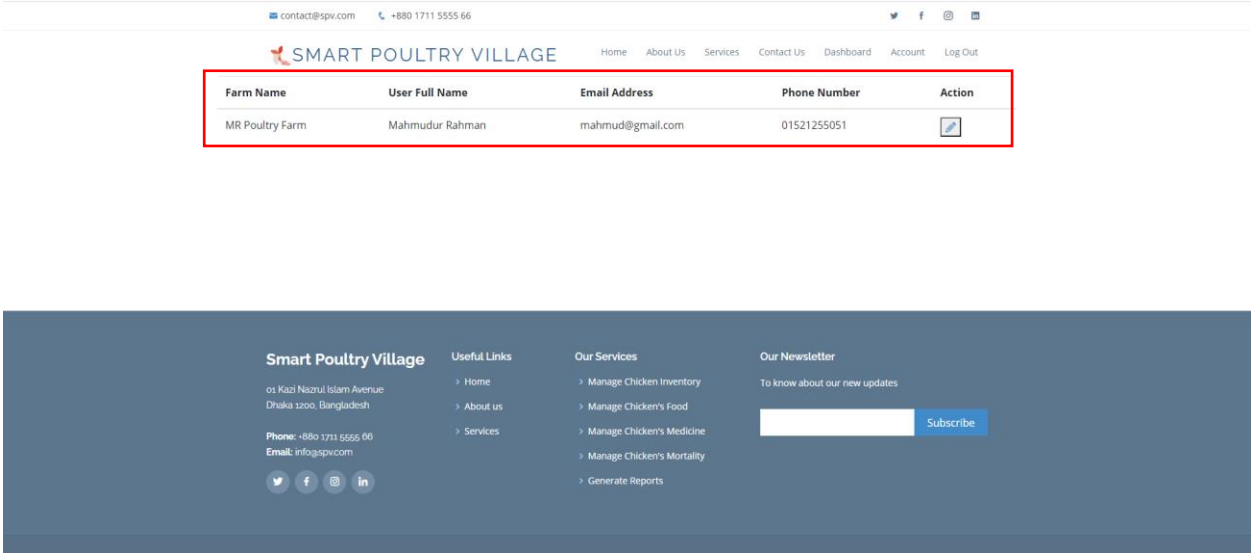


Figure 85: User details page containing user info.

User Details Update

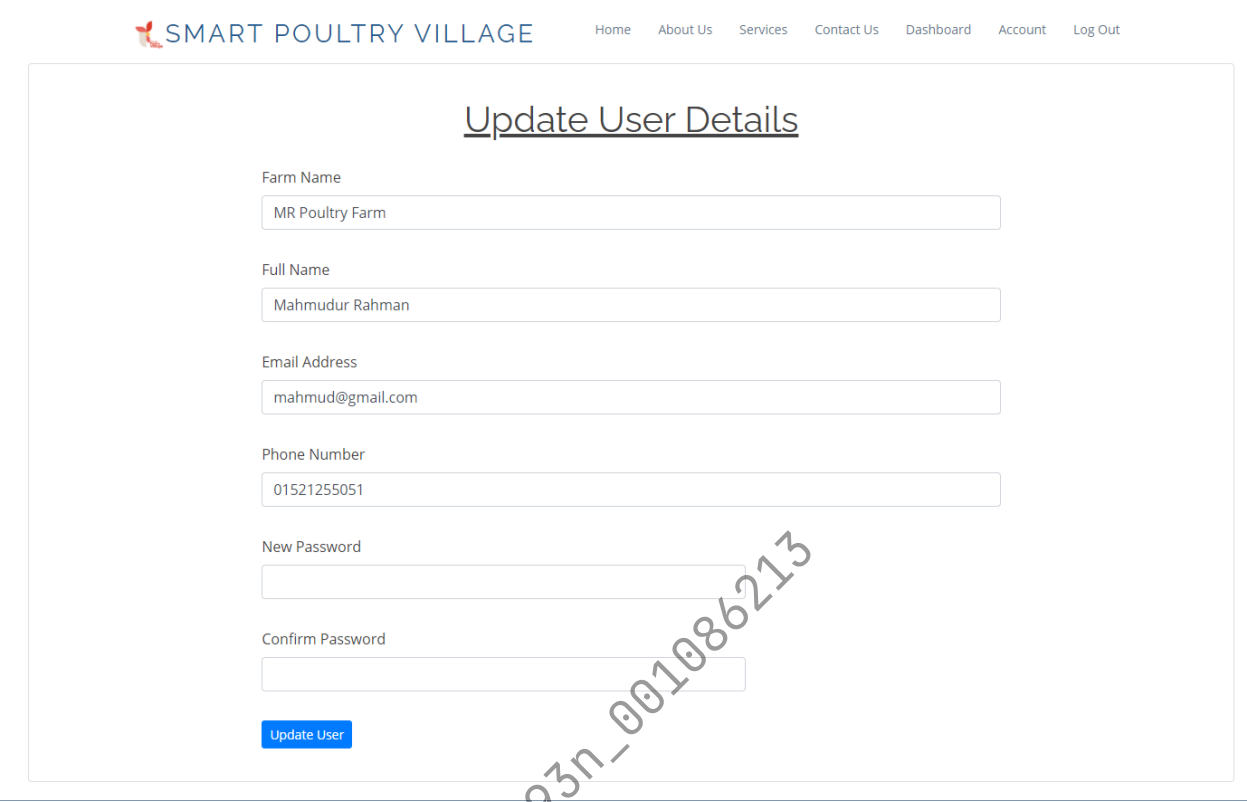


Figure 86: User details Update form.

Manage Chicken

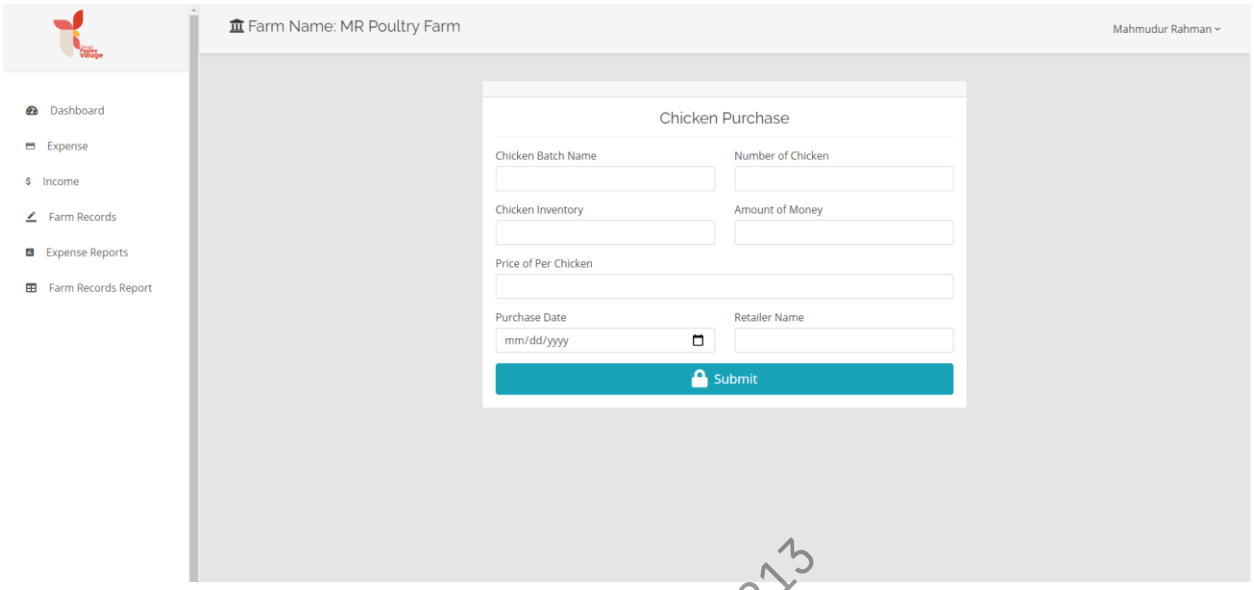


Figure 87: Chicken Purchase form.

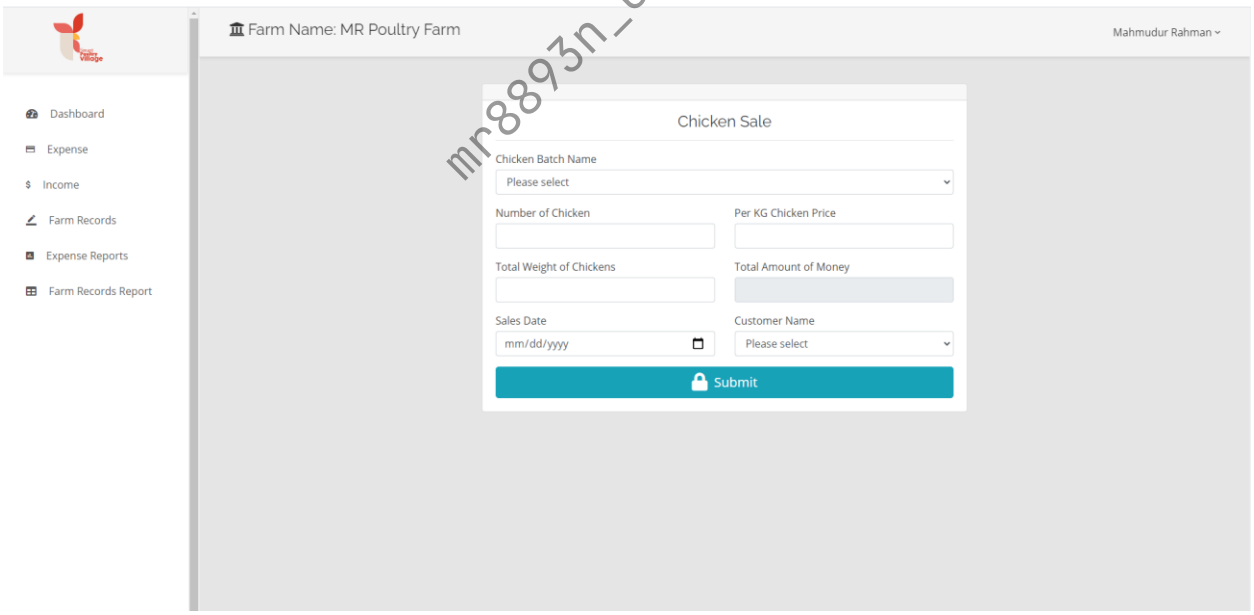


Figure 88: Chicken Sale Form.

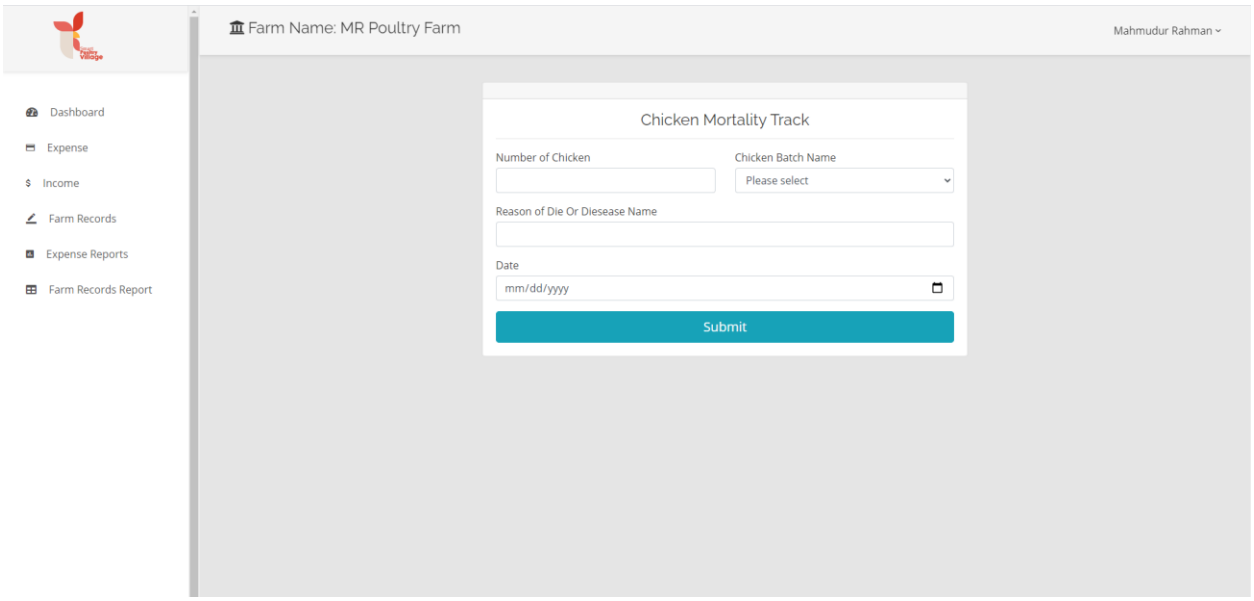


Figure 89: Chicken Mortality Form.

Figure 90: Chicken Purchase Details Report shown.

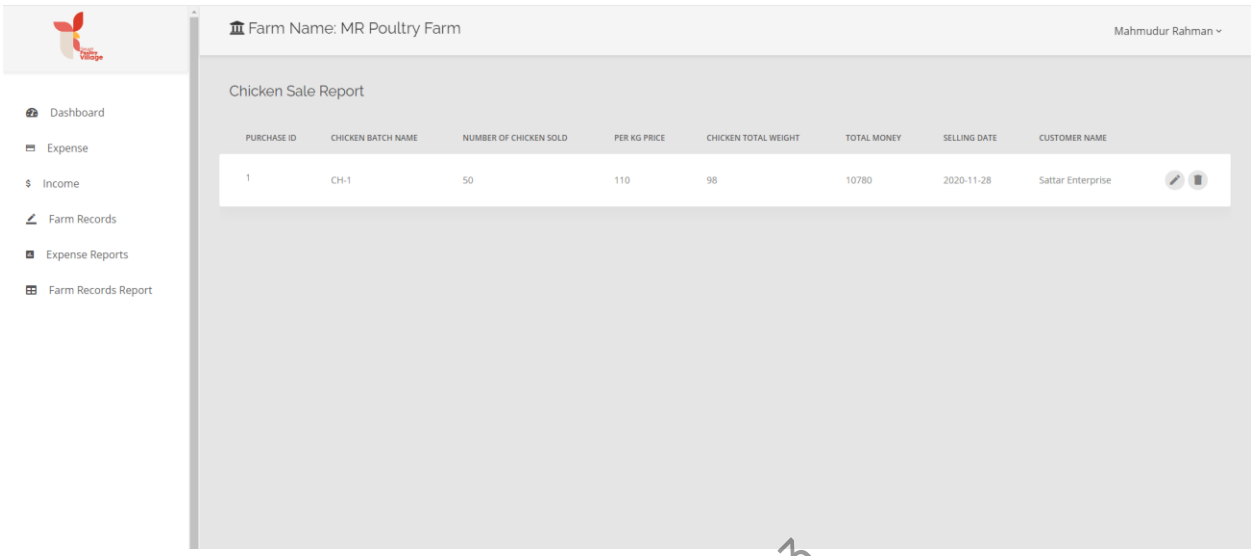


Figure 91: Chicken Sale Report shown.

Figure 92: Chicken Mortality Report.

Figure 93: Chicken Batch Wise Report.

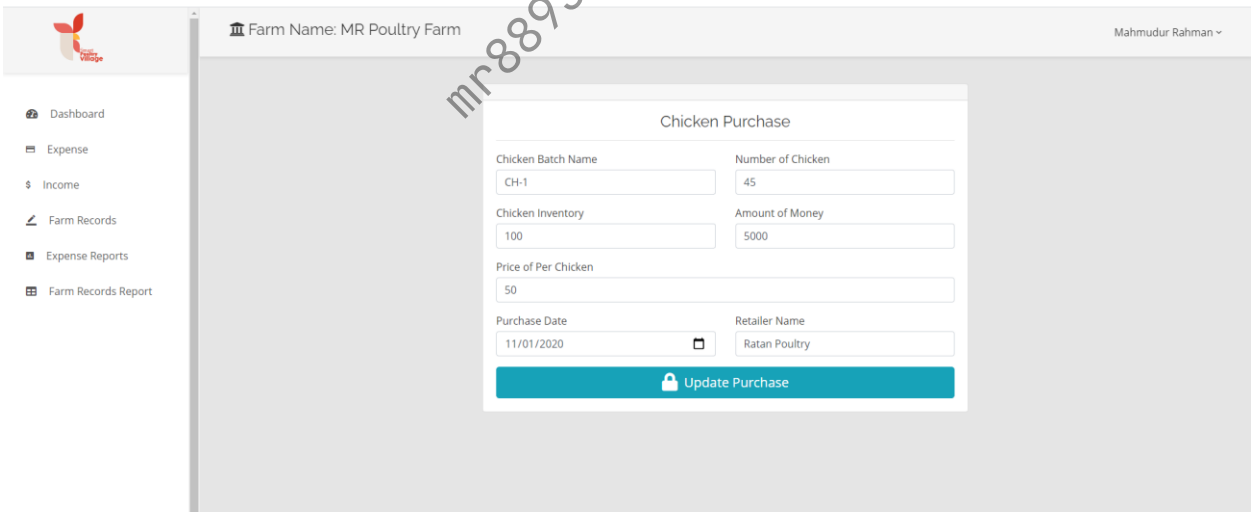


Figure 94: Chicken Purchase Update Form.

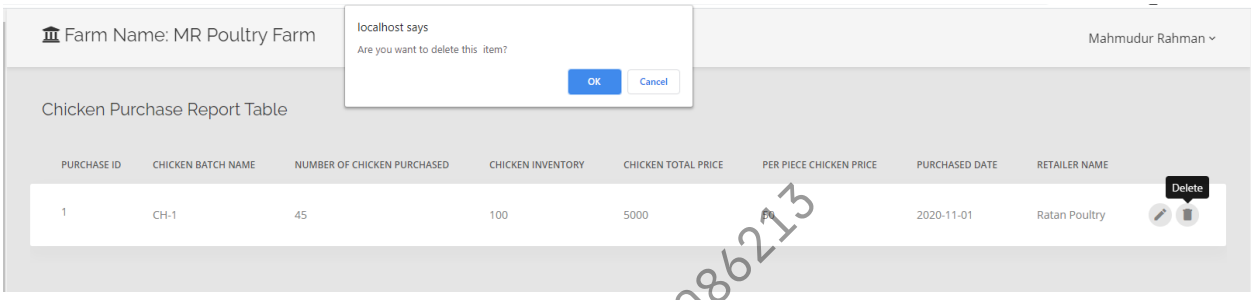


Figure 95: Asking confirmation for deleting data in chicken purchase.

Manage Food

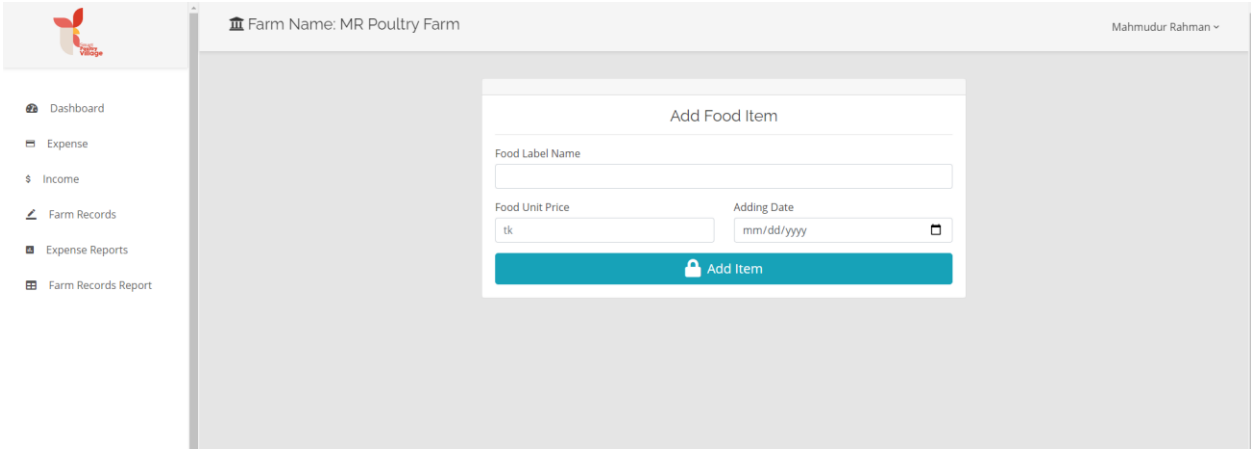


Figure 96: Food Item Form.

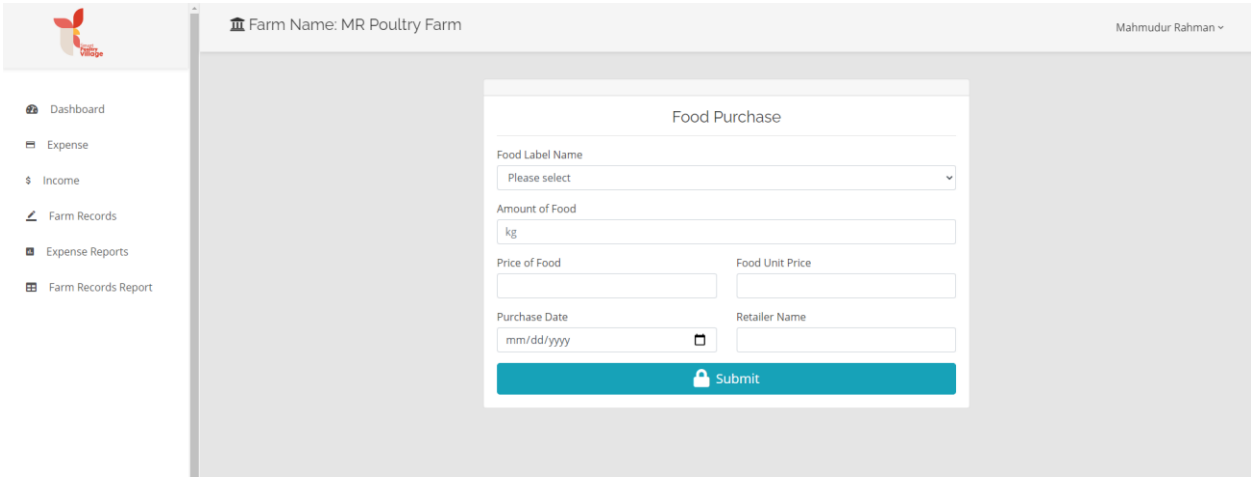


Figure 97: Food Purchase Form.

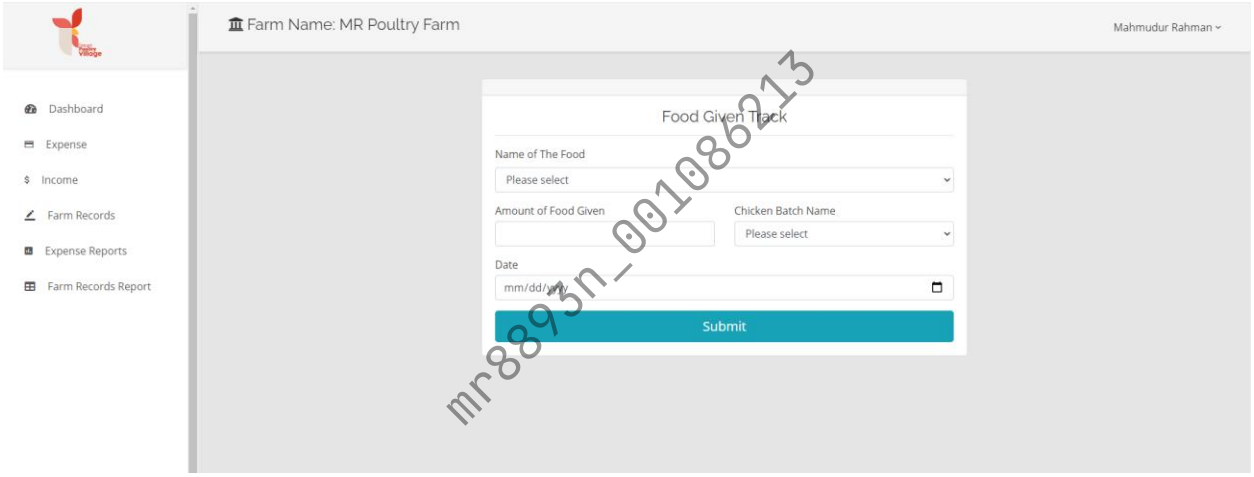


Figure 98: Food Given Form.

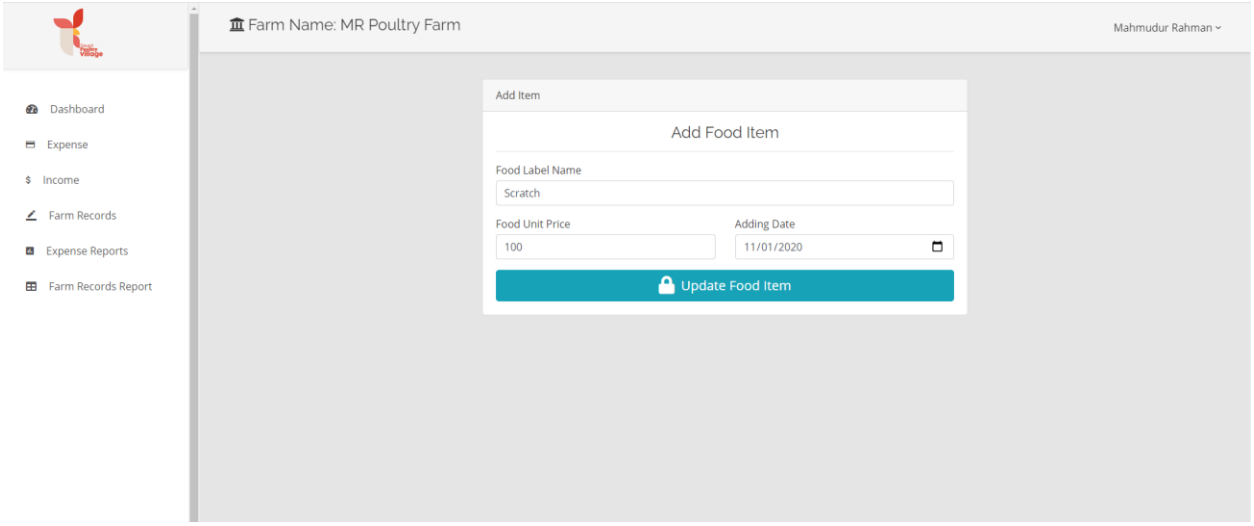


Figure 99: Food Item Update Form.

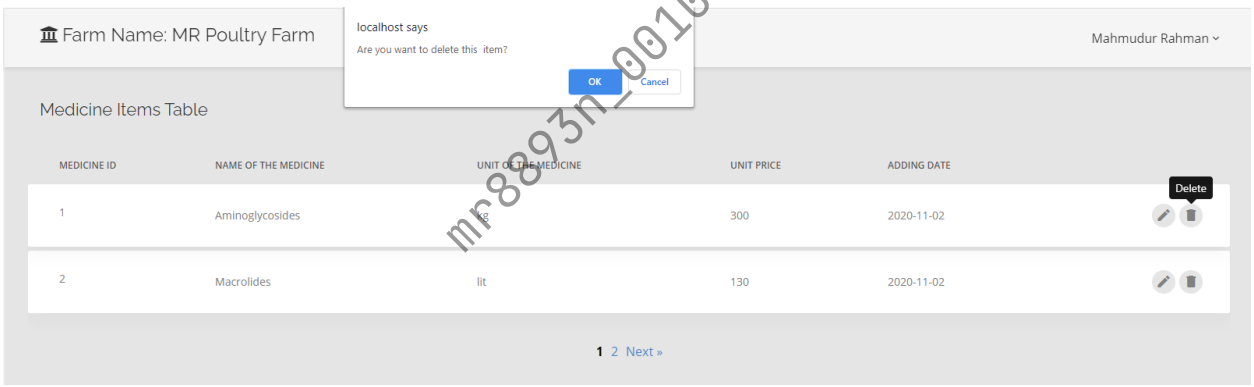


Figure 101: Food Item Delete confirmation.

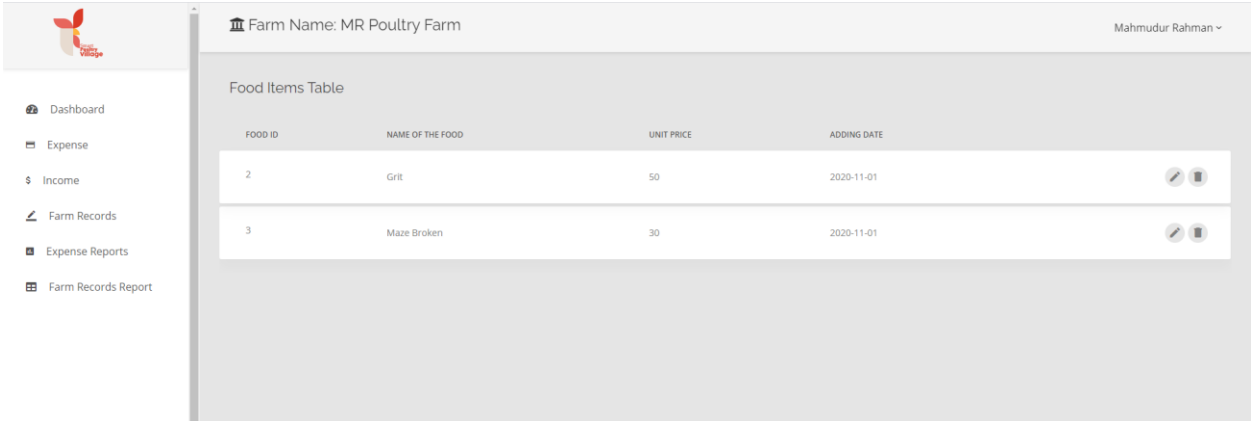


Figure 100: Food Items Report Table.

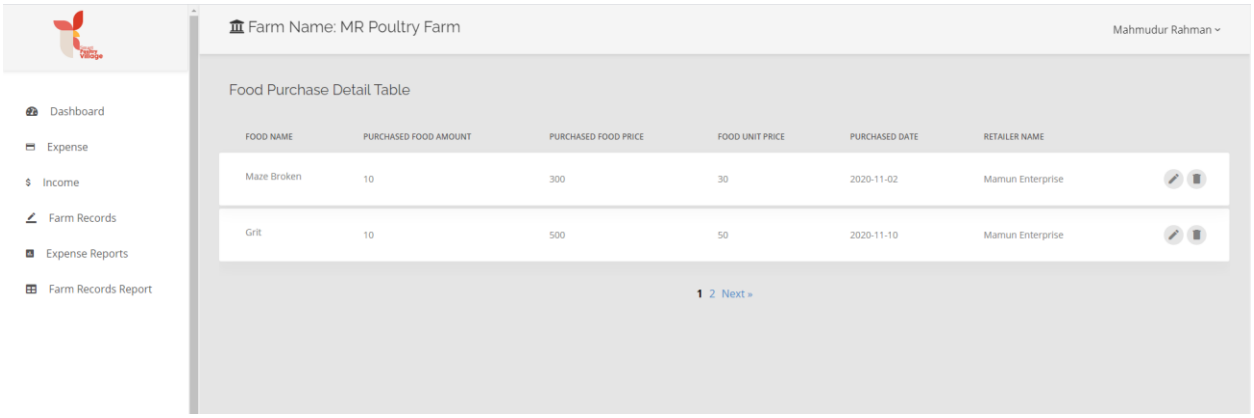


Figure 102: Food Purchase detail Report.

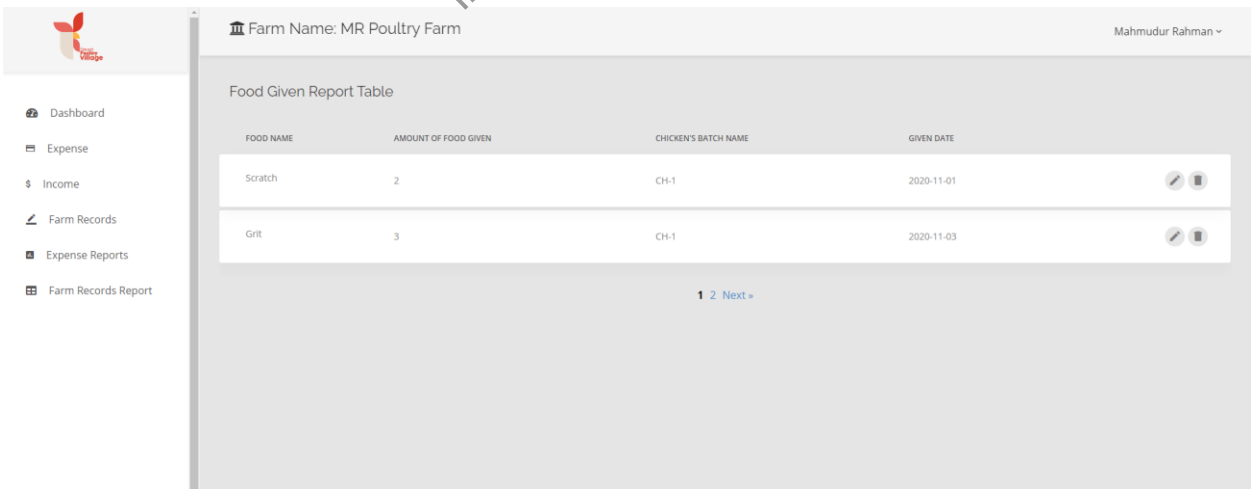


Figure 103: Food Given Report.

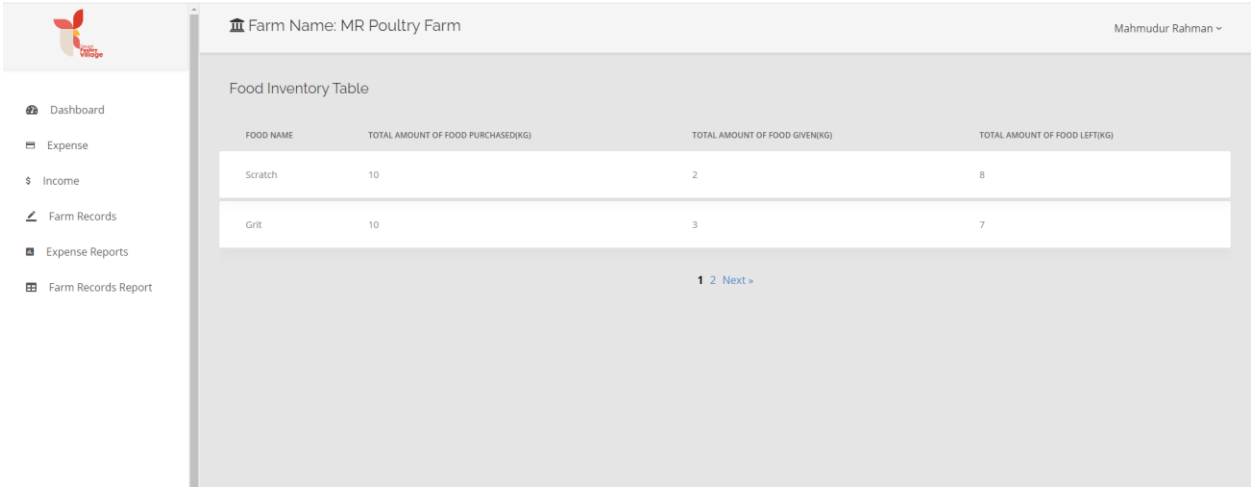


Figure 104: Food Inventory Report.

Manage Medicine

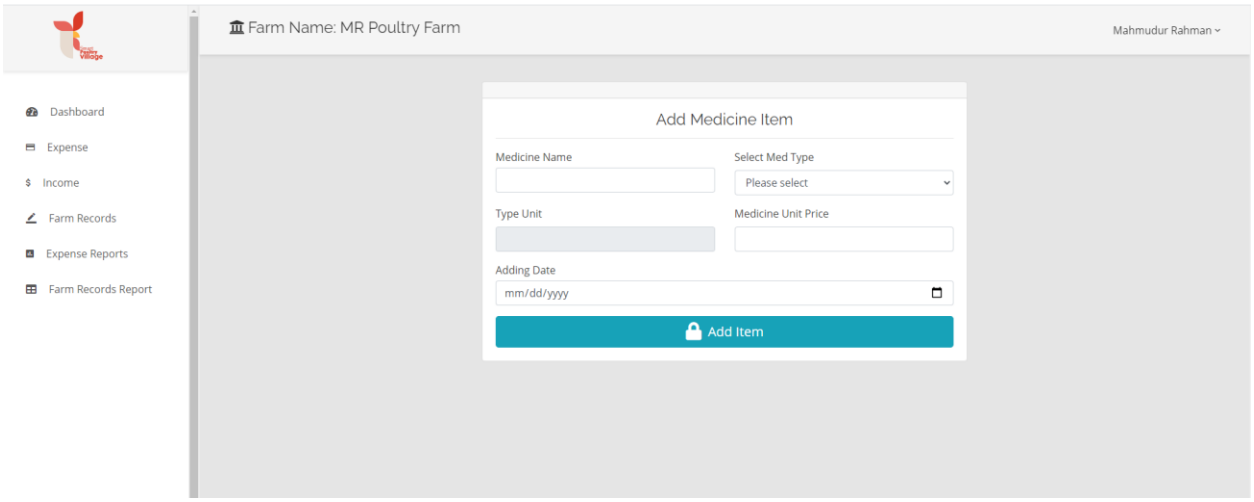


Figure 105: Medicine Item adding form.

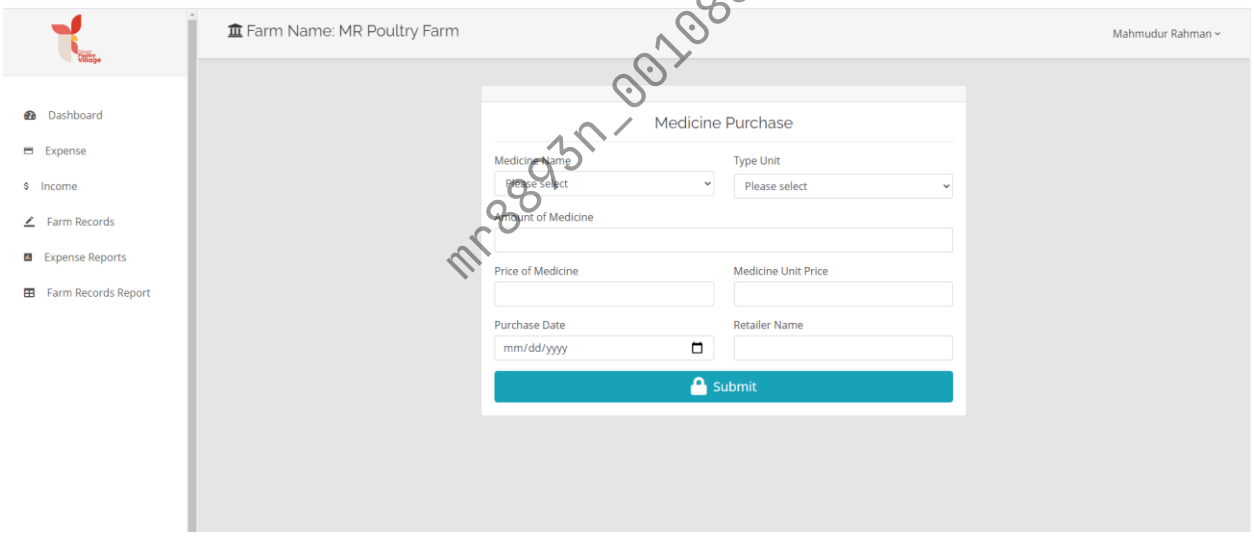


Figure 106: Medicine Purchase form.

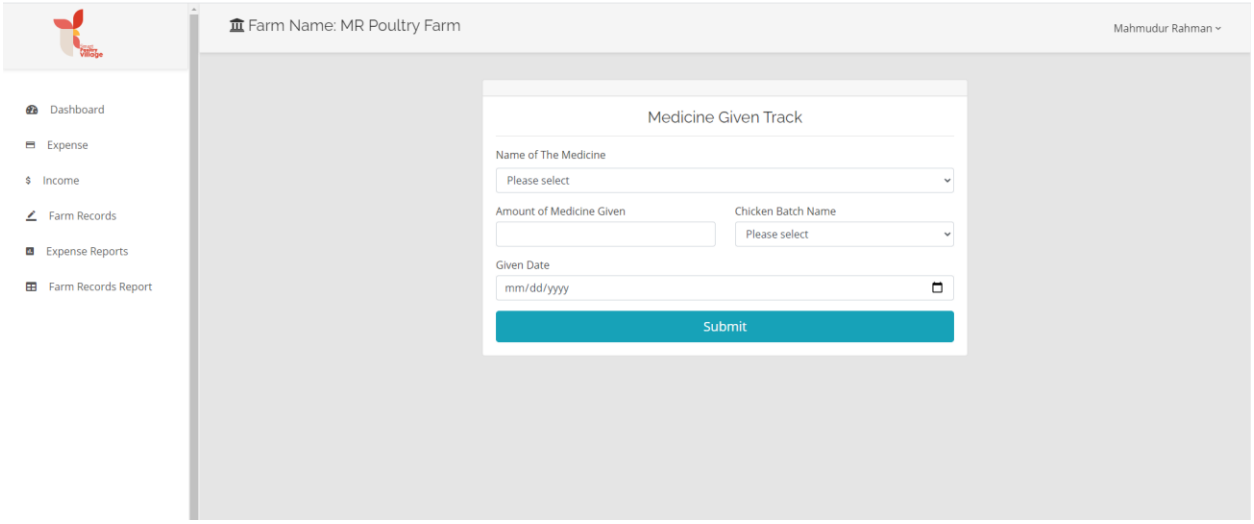


Figure 107: Medicine Given Form.

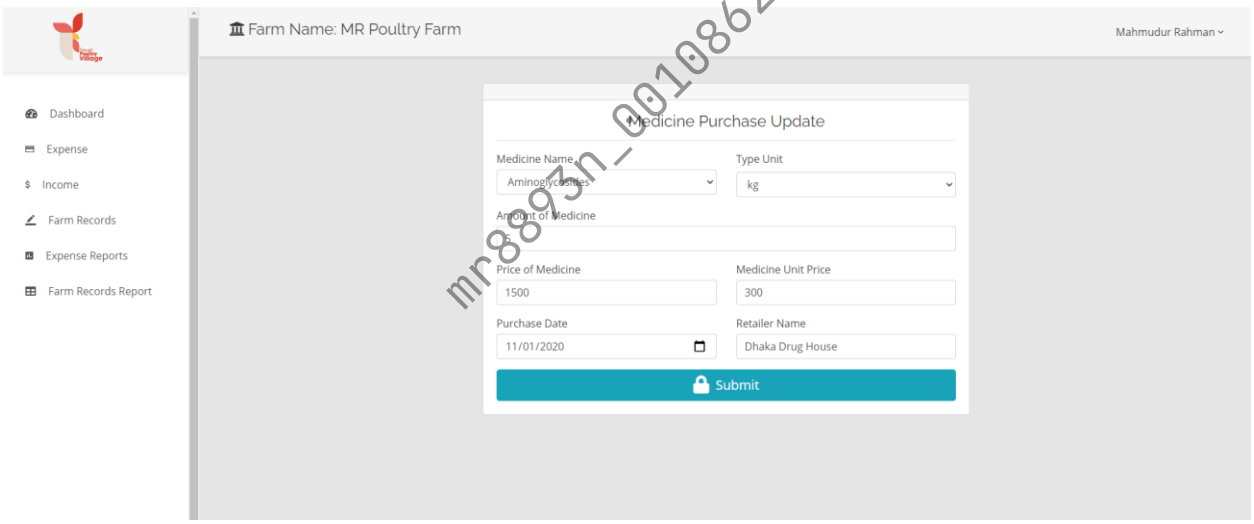


Figure 108: Medicine Purchase update form.

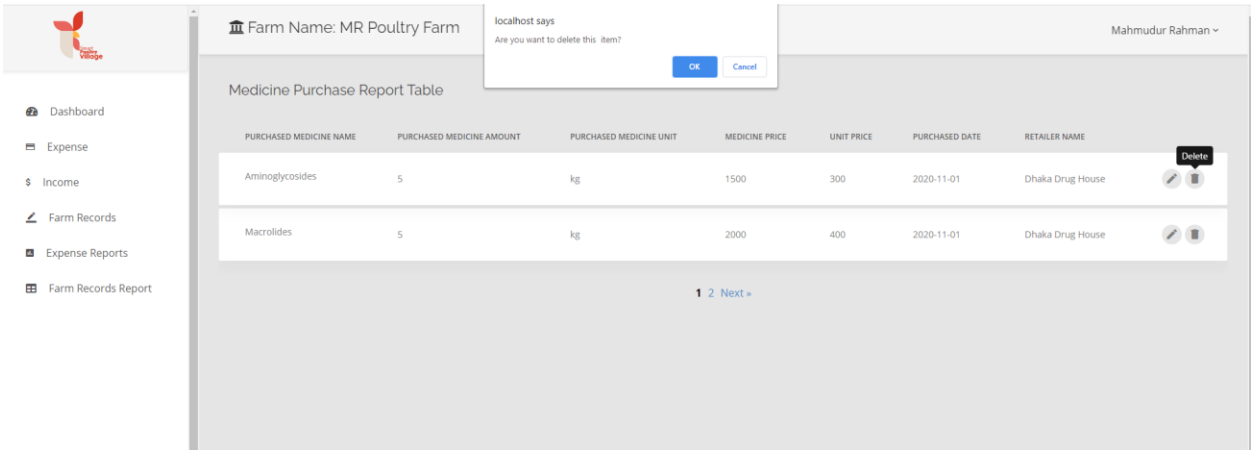


Figure 109: Medicine Purchase Delete option.

Figure 110: Medicine Items Table.

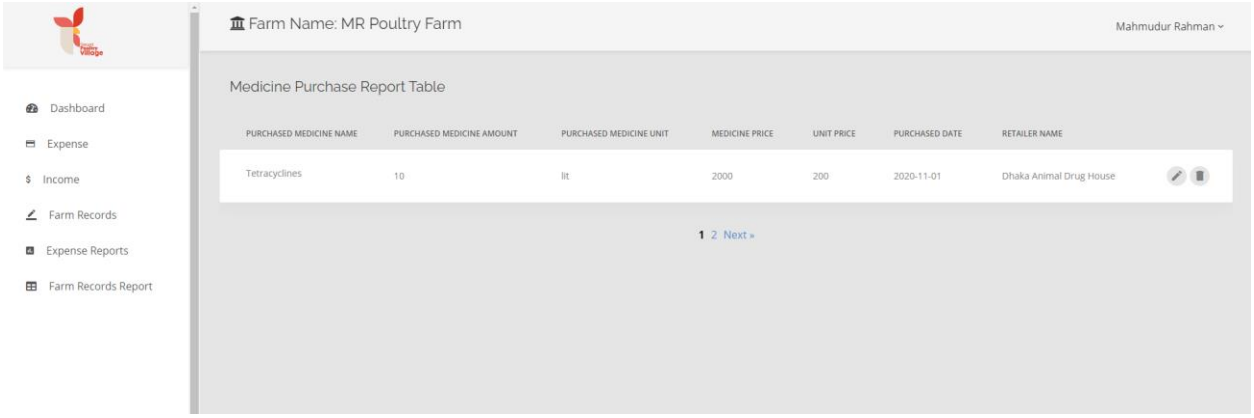


Figure 111: Medicine Purchase retails table.

Figure 112: Medicine Inventory Page.

Manage Transport

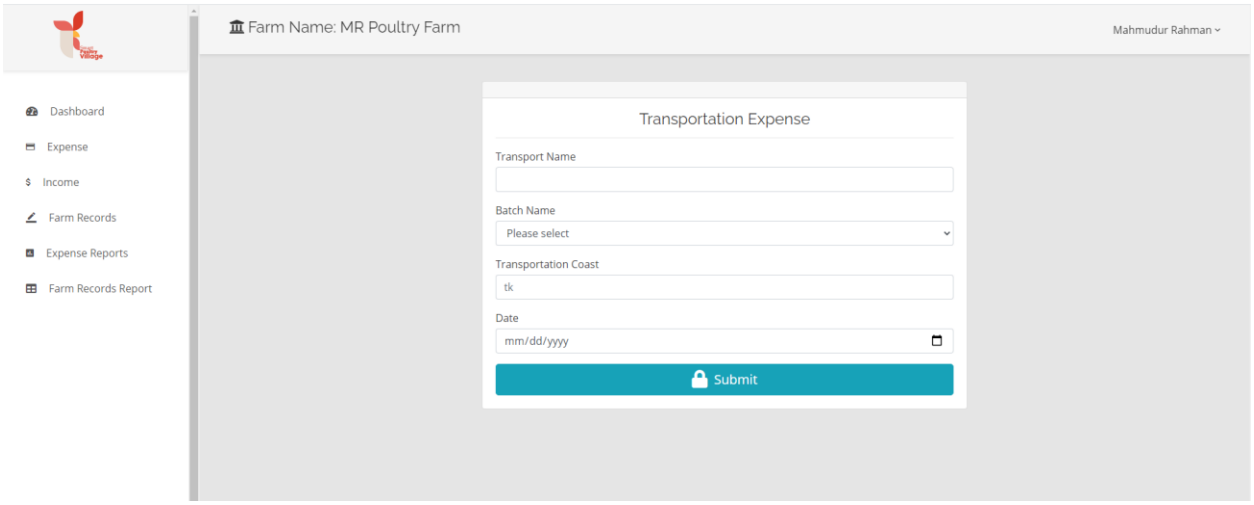


Figure 113: Transport Cost for chicken form.

Figure 114: Transport cost for chicken details table.

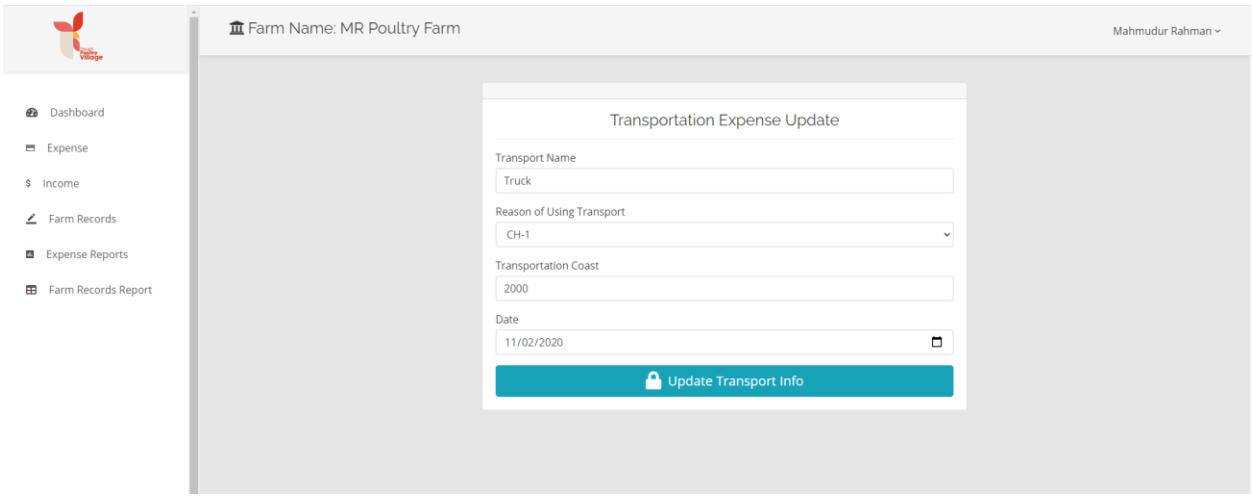


Figure 115: Transport Update Form.

Manage Employee

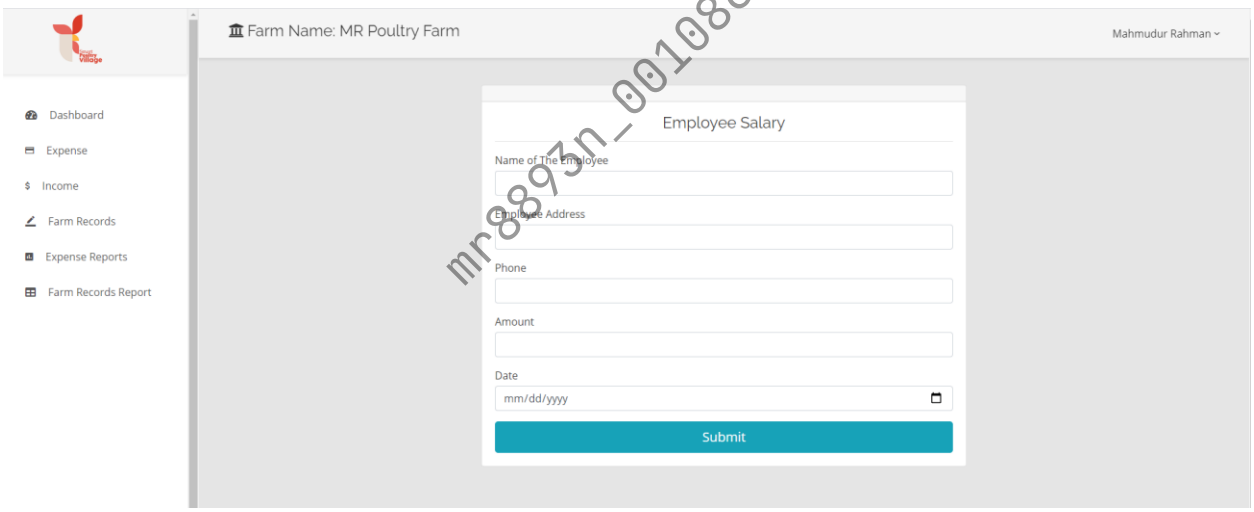


Figure 116: Employee Salary Given form.

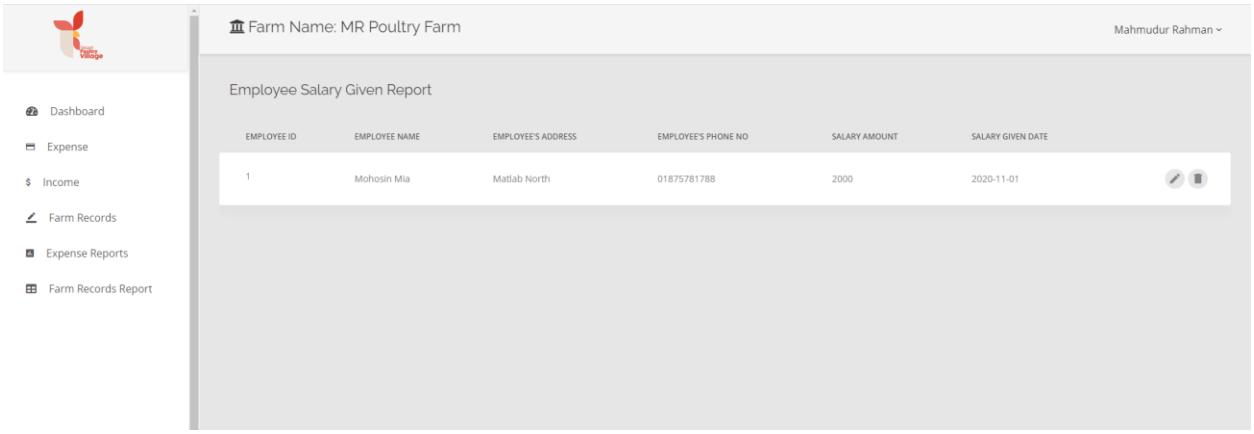


Figure 117: Salary Given Details Table.

Manage Other Expense

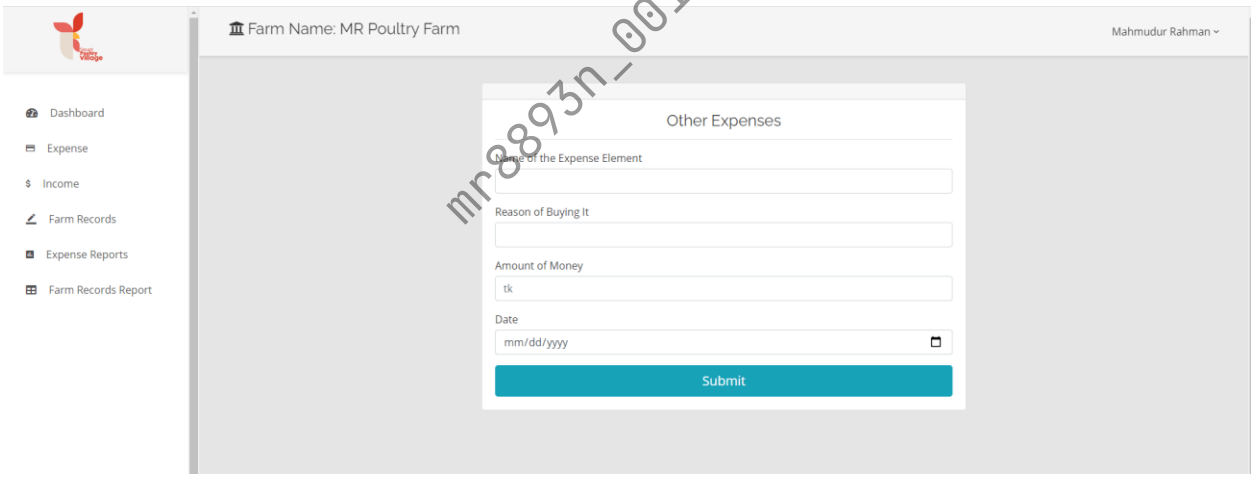


Figure 118: Other Expense form.

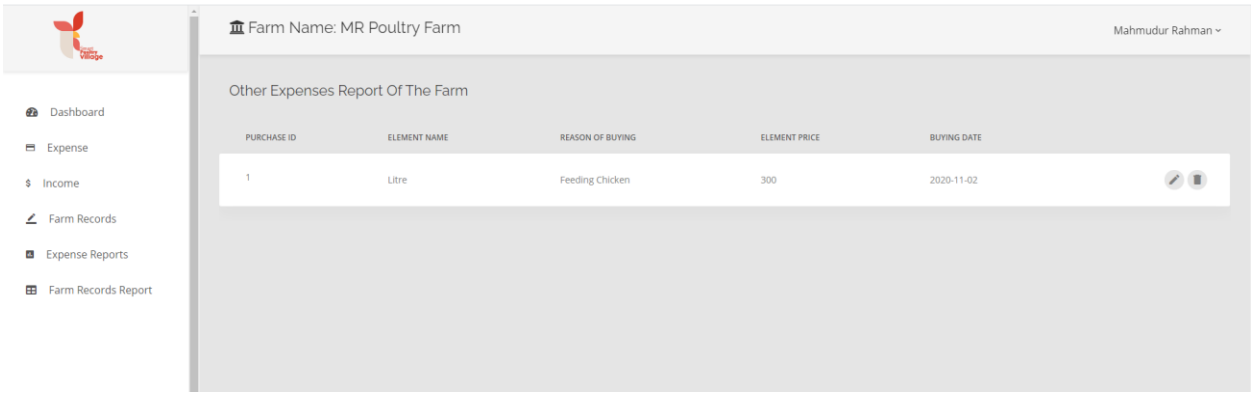


Figure 119: Other Expense details table.

Manage Customer

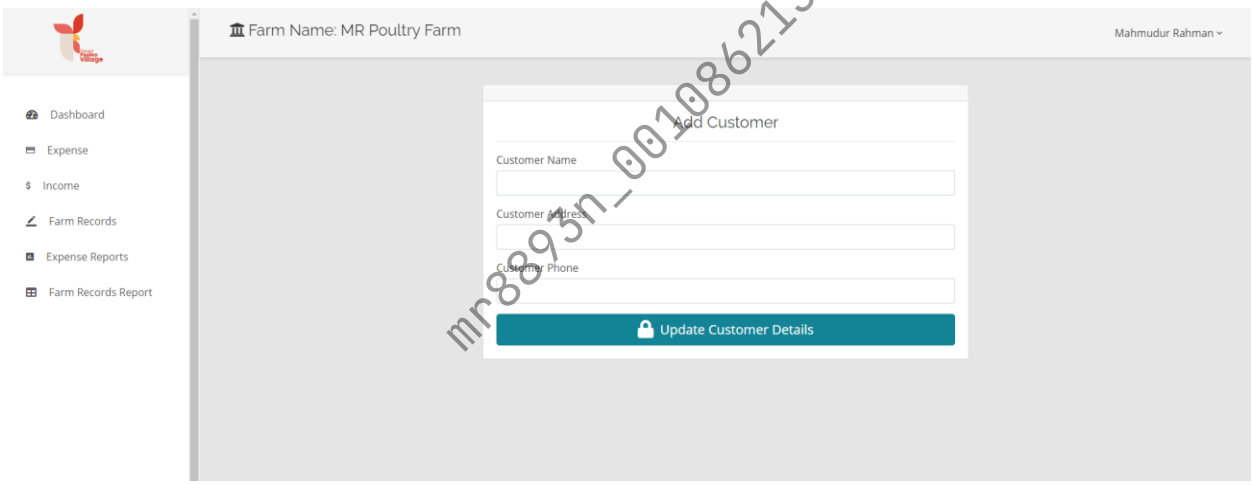


Figure 120: Customer Adding Form

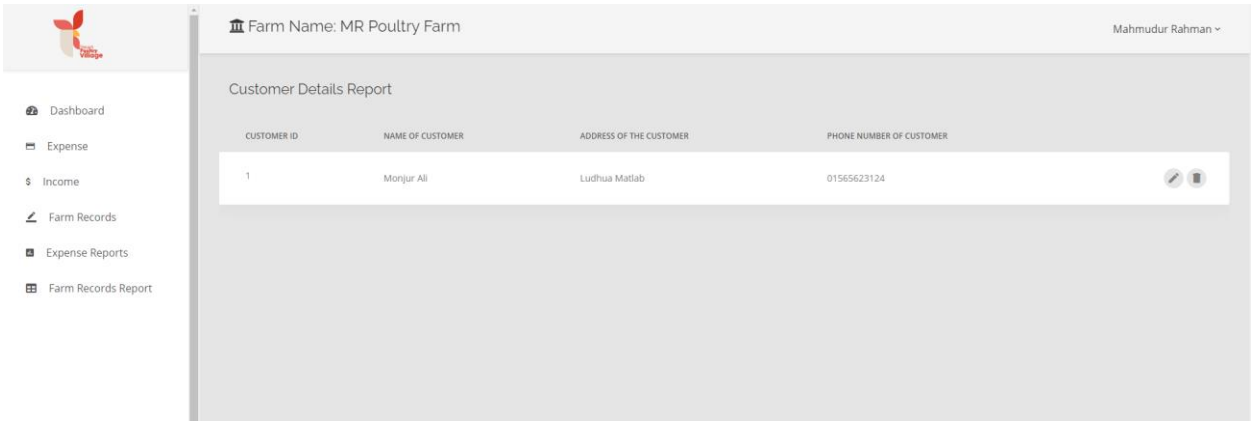


Figure 121: Customer Details table.

Dashboard

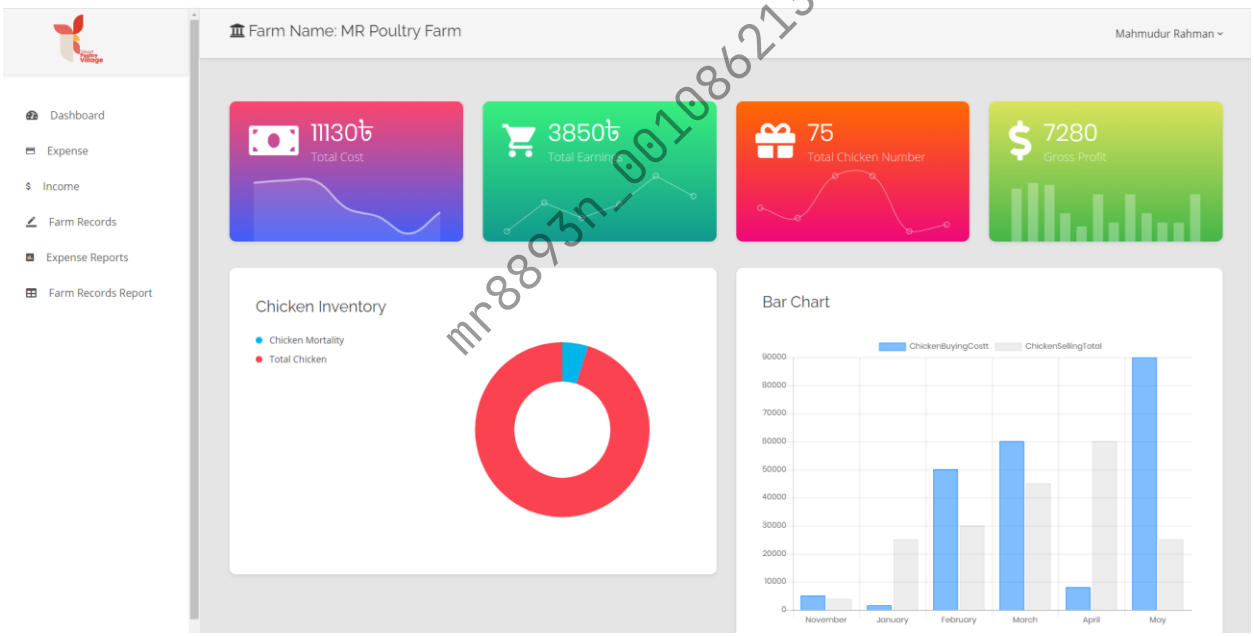


Figure 122: Dashboard for user.

18.6 Appendix G – Testing

Unit testing

No of Test	Action	Expected Result	Final Result
01	Any letter given in phone number field it will show error	Form will not submit and shows error for filling up with wrong data type in the fields.	Error shown and form does not submit.

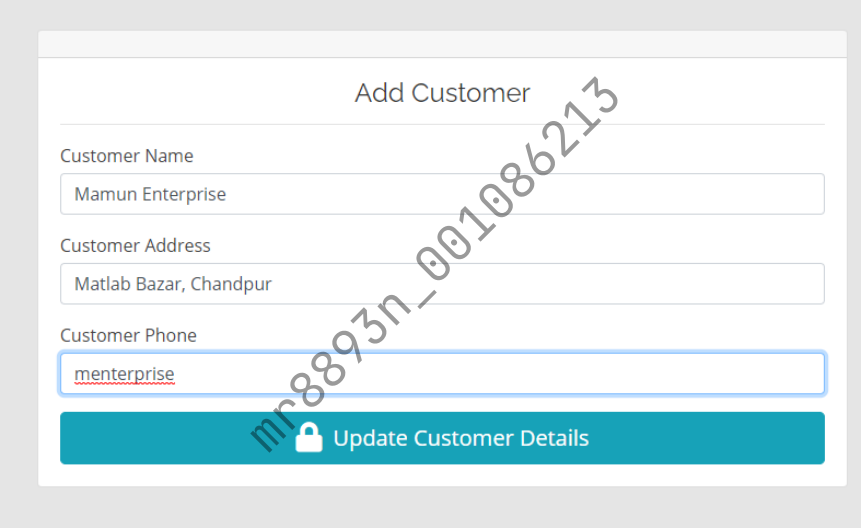


Figure 123: Customer phone filled with wrong data type in the fields.

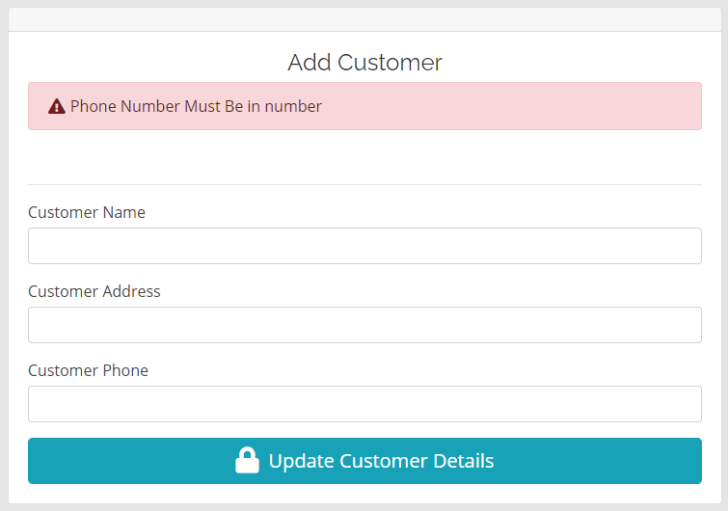


Figure 124: Error shows for not providing number in the field.

Module Testing

No of Test	Action	Expected Result	Final Result
01	Giving new unit price of food while purchasing updates the old unit price.	New unit price will replace the old ones.	As expected,

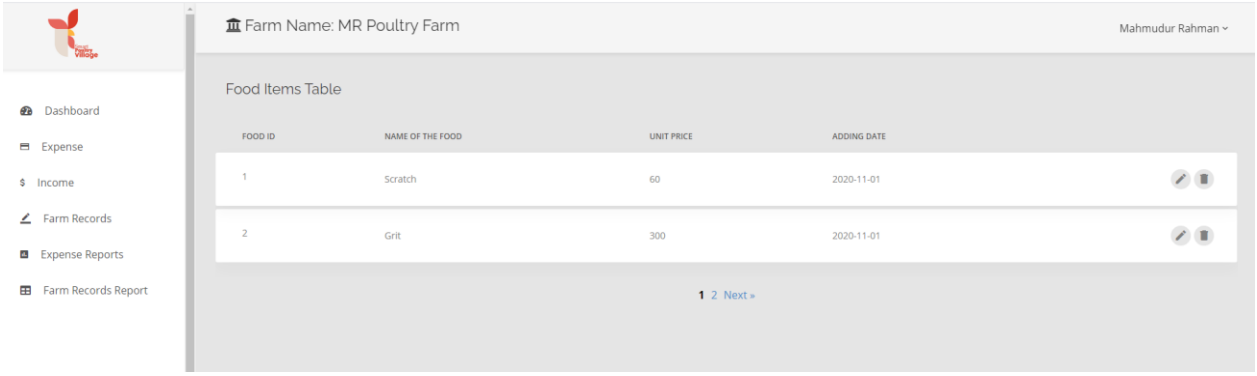


Figure 125: Here old unit price is 60 for Scratch.

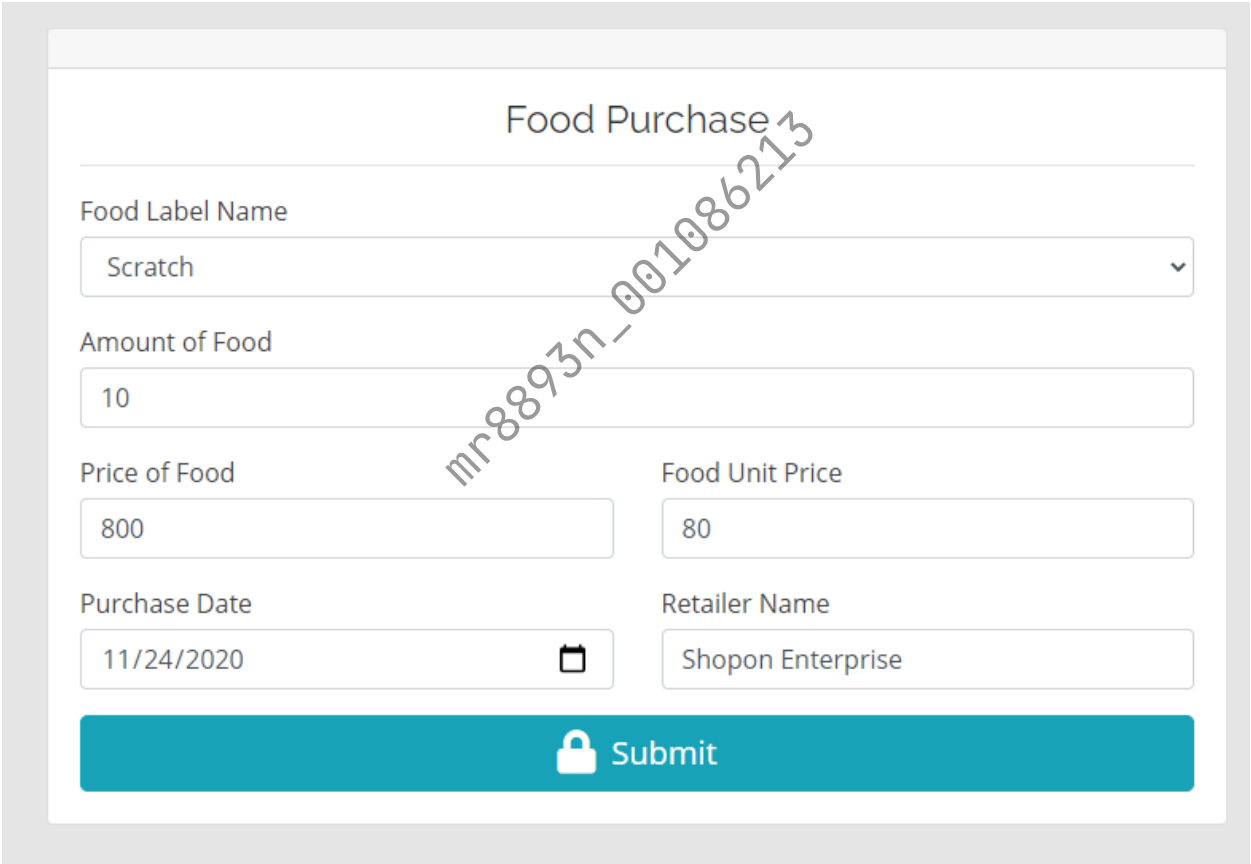


Figure 126: New Food Price for scratch is 80.

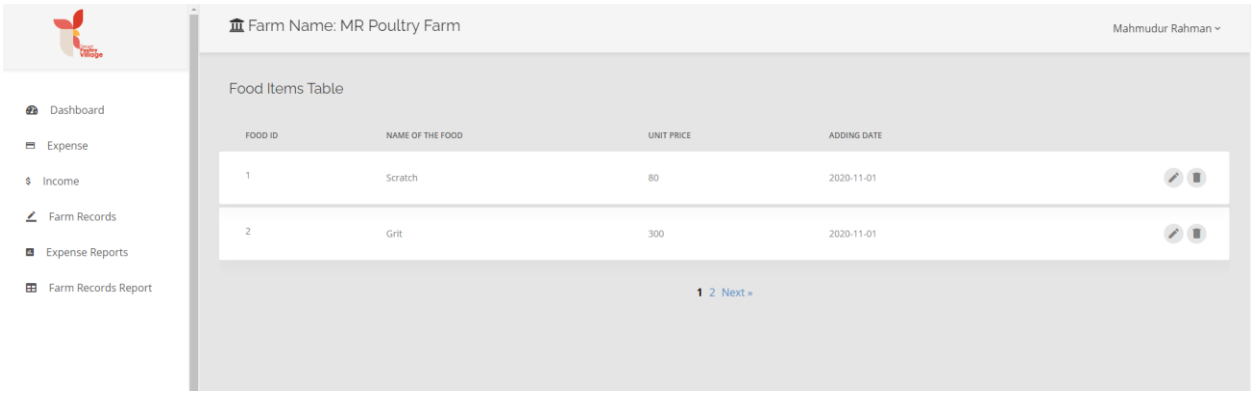


Figure 127: Updated unit price for Scratch becomes 80.

No of Test	Action	Expected Result	Final Result
02	After giving food to the chicken, system automatically subtract the given amount from total amount in food inventory.	Total amount updated successfully in food inventory.	As expected,

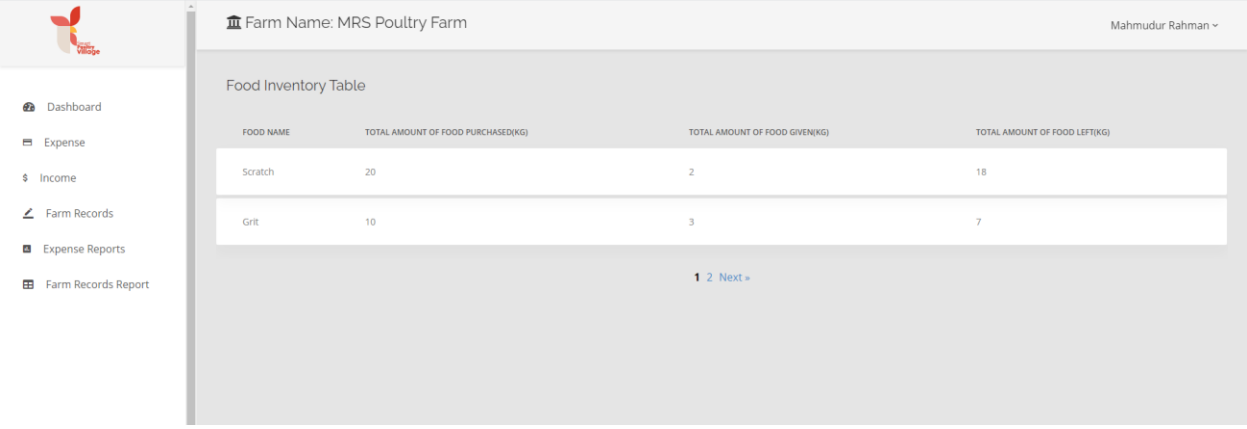


Figure 128: Total amount of food for Scratch is 18.

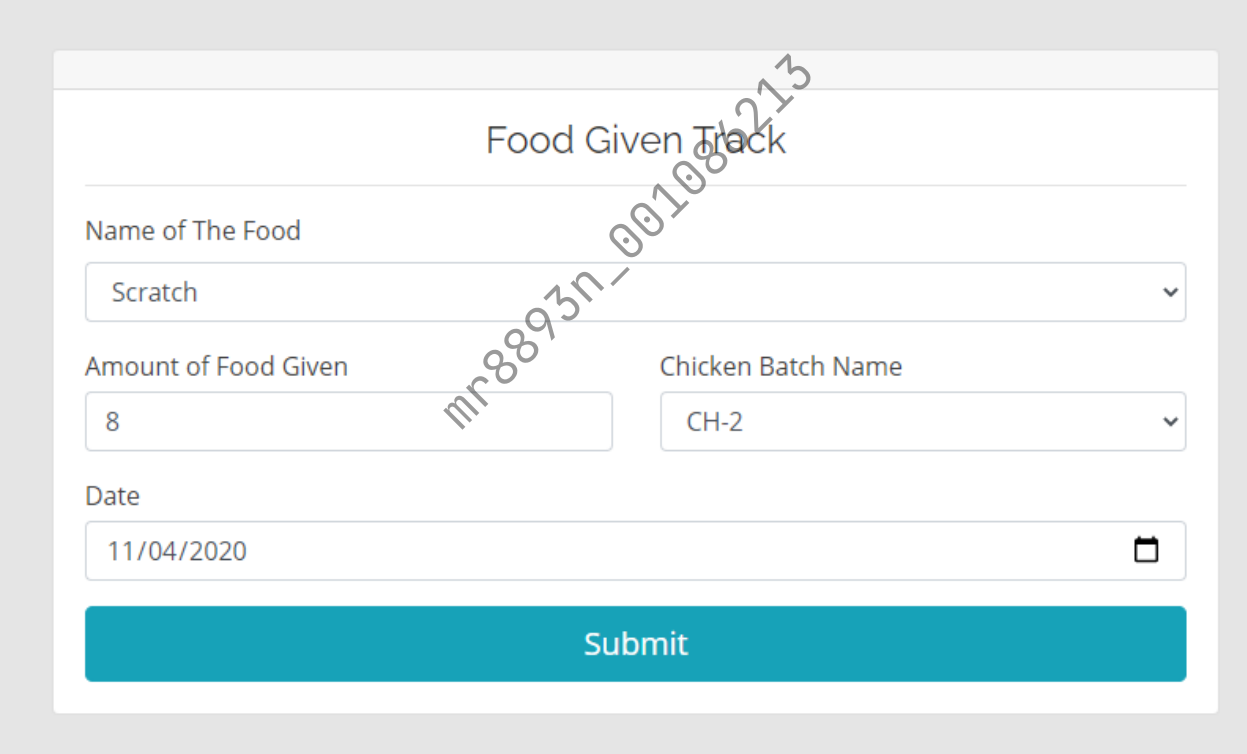


Figure 129: Given amount food is 8.

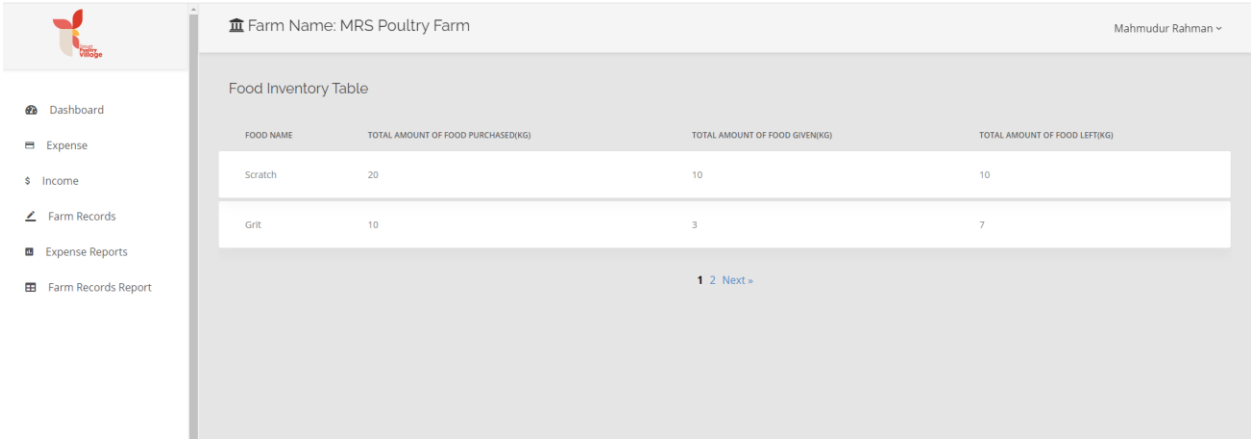


Figure 130: Updated food Inventory total amount become 10.

Acceptance Testing

No of Test	Action	Expected Result	Final Result
01	After accessing to the system user can see dashboard.	User can see dashboard after accessing system	As expected,

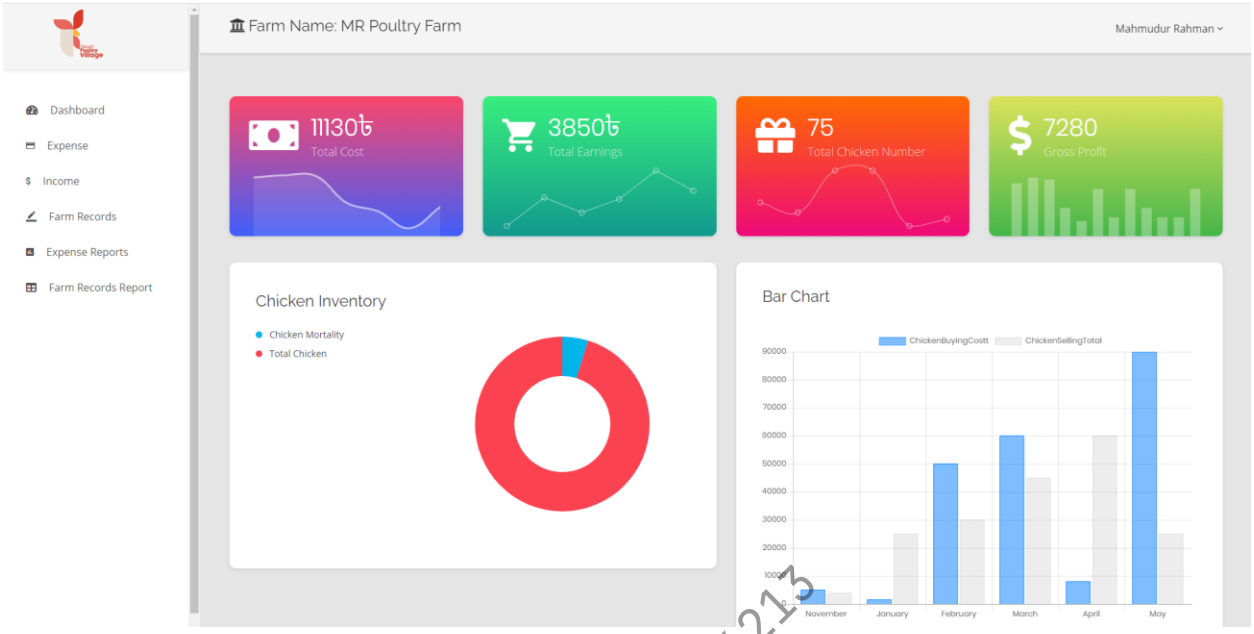


Figure 131: Dashboard user can view after accessing to the system.

Performance Testing

No of Test	Action	Expected Result	Final Result
01	Run the application in Mozilla Firefox.	Runs the application smoothly and all things works perfectly	As expected,

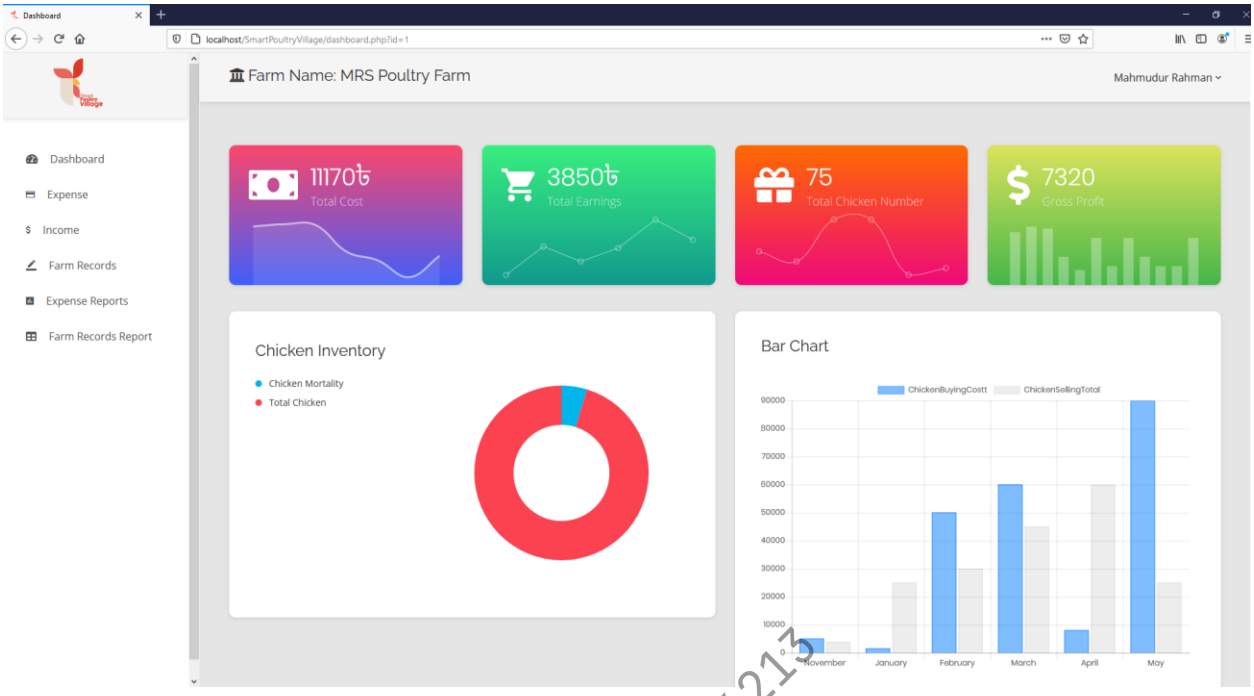


Figure 132: Runs on Mozilla Firefox Perfectly.