American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

Garden AID

A Software Requirement Engineering Project Submitted
By

Semester: Spring_22_23		**Section: D**	**Group Number: 02**	
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The project will be Evaluated for the following Course Outcomes

Evaluation Criteria	Total Marks (50)	
Introduction, Format, Submission, Defense	[10 Marks]	
System Overall Description & Functional Requirements	[10 Marks]	
System Quality Attributes and Project Requirements	[10 Marks]	
UML and E-R Diagram with Data Dictionary	[10 Marks]	
UI/UX Prototyping	[10 Marks]	

Software Requirements Specification

for

Garden AID

Version 1.0 approved

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01 May 2023

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1. Introduction

1.1 Purpose

A Software Requirements Specification (SRS) documents mainly focused to offer a complete description of the software product that will be built. As well as, the SRS document plays a vital role for communication between the software development team and stakeholders such as customers, users, and developers. It also describes the software's functional and non-functional requirements, limitations, assumptions, and other key elements. We are going to develop a system where we can buy and sell tree on a digital platform. It will look an online mart of trees. The purpose of developing an online tree mart will provide a convenient platform for customers to purchase trees and other related products online. The online tree mart will serve as a marketplace for various tree species, including fruit trees, ornamental trees, and shade trees, as well as related products such as mulch, fertilizers, and gardening tools. In this document we will write down the most common and important things which need to follow to write down a SRS document regarding out project. Overall, this document will provide a great overview regarding our project.

1.2 Document Conventions

There are several types of conventions can be followed when we are going to write the SRS document. It's a description of a software development or a software to be developed. To make a SRS document we have to follow a sequence to write it down. We have to provide functional and non-functional requirement as well as UML diagram such as use case diagram is most important cause it visualized the information of how user interact with the system and software. One of the most important is table of content to direct the readers to their desired information pages. Here in this document, we have tried to add most common and important things regarding our project and readers should follow the table of content to get the proper direction.

1.3 Intended Audience and Reading Suggestions

As we know that when we are going to build a software there are several types of people are get involved such as developers, project managers, marketing staff, users, stakeholders, testers and documentation team. This document will help all type who are involved with the software. Cause we will provide various types of information regarding the project. But when a reader going to start to read this document, he should read the problem description and the solution analysis because that will introduce the reader with the software name and the purpose of the software.

1.4 Background Study

As in the world we can several types of mart or online shopping platform where people can buy their daily needs. For example: Daraz, Amazon, Rokomari, Pickaboo etc. Here Daraz and Amazon are the platform of several daily needs and households. On the other hand, Rokomari is a place where only books are placed for selling. Pickaboo is a digital mart which is mainly focused on mobile and electronic

accessories. But we can not get any kind of dedicated online shopping mart for the gardening product mainly is tree. From that idea this software going to be developed. This mart in convenience for consumers. Consumers will get a large scale for selection and sellers can easily upload their product for selling and there will be a competitive pricing environment. Most important thing is that easy delivery for the consumers. We hope that the online tree mart could provide a convenient, efficient, and cost-effective way for customers to purchase trees and related products, while also providing an opportunity for tree growers and sellers to reach a wider audience and expand their business.

1.5 Scope and Vision of the Project

Projects are developed with a scope and vision. As in our society we can see lot of people who love to do gardening. But to that type work they can not get reliable source to get plant easily or any kind of instrument. However, the people who are living in the city area they are facing this problem in wide range. This online mart will open a door to encourage people in gardening. It will be a great scope to convert the gardening into a digital platform. As we can see that in each sector's online systems are arrived to make our life easy and comfortable so why gardening will remain in back-dated. Overall, the scope and vision of an online tree mart project would be to create a comprehensive and user-friendly online marketplace for trees and related products that meets the needs of both customers and tree growers/sellers. By establishing clear goals and objectives, defining the target audience, and identifying the key features and functionality, the project team can work towards developing a successful online tree mart that meets the needs of its users.

2. Problem Description

There are many reasons to prove our domain is in the right context of a problem domain. One is global warming and another one is helping people to get out of the mental stress. According to Wikipedia global warming will likely rise to 1.5 °C abovepre-industrial levels between 2030 and 2052 if warming continues to increase at the current rate. This will make the planet inhabitable because of the melting of the ice of the north and South Pole. People are suffering for mental stress far more than any past time in the history. A 2007 study found a bacterium in plant soil called Mycobacterium vaccae that triggers the release of serotonin, which lifts mood and reduces anxiety. We know that forests are essential to clean air. Through photosynthesis, the leaves of trees take in carbon dioxide and water. Combined with the sun's energy, they convert these materials into nutrients. A by-product of this process? Oxygen. One large tree can produce as much as a day's supply of oxygen for four people. Trees also reduce the effects of PM, which are particles of different chemicals that can cause lung and heart disease. This makes trees especially valuable in cities where pollution is higher. They also store carbon dioxide and keep it out of the atmosphere. healthy forests are essentially large air filters. Deforestation has the opposite effect. It removes an essential source of cleaner air and releases the stored carbon, worsening the air quality. Bad air has serious consequences. According to the World Health Organization, around 4.2 million people die every year as a result of outdoor air pollution. Those who don't die are at risk for a score of lung and heart diseases. But on the other hand, ecosystem services are the benefits that flow from nature to people. They

can be provisioning (e.g. supply of food, clean air, water and materials), regulating (e.g. water and climate regulation, nutrient cycling, pollination, formation of fertile soils), or cultural (e.g. recreation opportunities, inspiration we draw from nature). Natural ecosystems can provide a wide range of these services simultaneously. This multi-functionality is one of the key attractions of green infrastructure. Our societies and economies depend on healthy ecosystems and their services. A network of healthy ecosystems provides alternatives to traditional 'grey' infrastructure, often at a fraction of their cost.

3. Solution Analysis and Description

We are going to propose multiple solution in our software such plant care information, providing sell services, offering to buy services, delivery service and posting, messaging, calling opportunity, reviewing services, providing rent service of free land for gardening& community for discussing problem. This solution is particularly appropriate to solve the problem because of our country people do not know much about plant care that is why they cannot keep alive the plant after buying in some case. Even people do not know about the benefit of indoor plant or what are the indoor plants are. According to a recent Dhaka Chamber of Commerce and Industry (DCCI) statistics, the local market of flower and cut foliage has reached at Tk1,200 crores per annum and is witnessing a 10% yearly growth. This is enough to prove the solution is feasible to meet the business objective. Our software purpose is to take down the global warming and help people to deal with mental stress even to export various plant outside the Bangladesh in future. It will benefit the economy o four country and the most relevant benefits the earth will be more habitable for us.There are lot of software solution available related to it currently such as Home Garden, Urban veggie garden, Sowing Calendar-Gardening, Planter –Garden Planner, DIY Gardening planting, KhetiBuddy Home Gardening app and so on. But they are not a complete solution. First of all, they have not enough existing information and newly updated information. Except on that they don't have selling service, buying service, delivery service and posting, messaging, calling opportunity. These service makes our software project a unique one.

4. Description and Analysis of Social Impact

The digital tree mart has the potential to have a positive social impact by providing a platform for small-scale farmers and local communities to sell their trees and earn income. This can help support local economies and provide a source of livelihood for people in rural areas. Additionally, the digital tree mart can help increase access to tree seedlings, which can support reforestation efforts and contribute to environmental conservation. By promoting sustainable forestry practices and supporting local communities, the digital tree mart can have a positive impact on both people and the planet.

Moreover, the digital tree mart selling service can also promote sustainable forestry practices by encouraging the use of certified tree nurseries and promoting the sale of trees that have been grown using environmentally friendly methods. This can help mitigate the negative impacts of deforestation and promote the restoration of degraded lands. Additionally, the service can promote the use of agroforestry, which integrates trees into agricultural landscapes, providing multiple benefits such as improved soil health, increased biodiversity, and enhanced climate resilience. By providing a platform for people to buy

and sell trees online, the service can make it easier for individuals and organizations to access trees for various purposes such as landscaping, urban greening, and reforestation. This can contribute to a healthier environment and a more sustainable future. Additionally, the delivery service and posting feature can help ensure that trees are transported safely and efficiently, reducing the carbon footprint associated with transportation. The messaging and calling opportunity can help facilitate communication between buyers and sellers, promoting transparency and accountability. The reviewing services can help build trust and credibility within the online community, encouraging responsible and ethical practices. Furthermore, the rent service of free land for gardening can help promote sustainable land use practices by encouraging the cultivation of edible plants, reducing food waste, and promoting local food systems.

5. Overall Description

5.1 Product Perspective

The product perspective for an SRS (Software Requirements Specification) for an online tree mart would involve defining the system boundaries, interfaces, functions of the website. Some key aspects of the product are discussed in this document. First of all, the system boundaries, the online tree mart system would include the website itself, the e-commerce platform, and the database that stores information about the trees and related products. Secondly, the user interfaces will refer to the software would provide a user-friendly interface that allows customers to search, browse, and purchase trees and related products. The interface would also allow tree growers and sellers to upload information about their products and manage their inventory. After that a short description regarding functions that the software would offer a range of functions, including search and filter options, product information, customer reviews, shopping cart, secure payment and shipping systems, and order tracking. Another important thing is that data management which stands for the database would store information about the trees and related products, including product descriptions, pricing, availability, and customer reviews. The database would also track customer orders and provide reporting features to help tree growers and sellers manage their inventory. Overall, the product perspective for an SRS for an online tree mart would focus on defining the system boundaries, user interfaces, and functions of the software, as well as ensuring compatibility, scalability, and effective data management. By establishing clear requirements and specifications for the product perspective, the project team can work towards developing a successful and user-friendly online tree mart.

5.2 Product Functions

The project will have several types of functions which is called as functional requirement of the project. We will provide a detail discussion about this later on. Here you will get a short brief about the functions of the software as we can say some main focused functions are mentioned here. The software mainly focused on the online shopping process. We can say that is a online mart. The software would offer a range of functions, including search and filter options, product information, customer reviews, shopping cart, secure payment and shipping systems, and order tracking.

5.3 User Classes and Characteristics

Identifying user classes and their characteristics is an important step in designing a successful online tree mart. Some potential user classes are also involved with this application. Several user classes are discussed below:

Homeowners: this user class would likely include individuals who are interested in purchasing trees for their home or property. Their characteristics may include a desire for specific tree species, a limited budget, and a need for guidance and information about planting and care.

Landscapers: Landscapers are another potential user class, consisting of professionals who are responsible for designing and maintaining outdoor spaces. They may have more specific requirements, such as the need for large quantities of trees or specialized species for certain environments.

Tree Sellers: This user class would consist of businesses or individuals who grow and sell trees and related products. Their characteristics may include a need for a platform to sell their products, a desire for a simple and efficient interface for managing their own inventory, and the ability to track their sales and revenue.

Environmentalists: This user class may be interested in purchasing trees for their environmental benefits, such as providing shade, reducing erosion, or improving air quality. They may have a strong interest in the sustainability and eco-friendliness of the products offered on the website.

In the circumstances, we invite all types of user classes to use out platform but for some reason it depends on their specific needs and goals as well as by identifying and understanding the needs of some potential user classes will help the project team to develop the application and help them to meet the needs of all users and provide them a positive user experience.

5.4 Design and Implementation Constraints

When we are going to develop a software on that we have to follow some constraints to develop the application. That type of constraints may affect the development process as well as operational procedures. Some potential design and implementation constrains are discussed here.

Technical Constraints: The website would need to be designed to function effectively and efficiently on a range of devices and web browsers. Technical constraints may include limitations on the amount of data that can be transferred, server capacity, or software compatibility issues.

Time Constraints: The project team would need to work within a specific timeline to develop and launch the website, which may require prioritizing certain features or functionality.

Budget Constraints: The project team would need to work within a specific budget for the development and maintenance of the website, which may impact decisions about design, development, and implementation.

Legal Constraints: The website would need to comply with relevant laws and regulations related to e-commerce, data privacy, and consumer protection.

Security Constraints: The website would need to be designed with strong security measures to protect user data and financial information, which may include limitations on the type of payment and shipping systems that can be used.

Overall, the design and implementation constraints for this software would need to follow carefully and if any kind of problem occurred that should be addressed must and that will help us to meet the user's requirements.

5.5 User Documentation

User documentation is an important aspect of any software project, including for our application. The purpose of user documentation is to provide clear and concise instructions to users on how to use the website effectively. Here we will provide some user documentation for the users to use our application without any kind of obligations:
User Manual: A comprehensive user manual would provide an overview of the website and its features, including how to create an account, search for trees, browse products, and complete a purchase. It would also include information on payment and shipping options, as well as guidance on tree planting and care.
FAQs: Frequently asked questions (FAQs) can provide quick answers to common user queries, such as how to reset a password or change an order. FAQs can also address any technical issues or error messages that users may encounter.
Tutorials: Step-by-step tutorials can be helpful for users who are new to the website or need guidance on specific tasks, such as how to search for a specific tree species or how to use the shopping cart.
Video Demos: Short video demos can be a useful way to demonstrate specific features or functionality of the website, such as how to use the search filters or how to track an order.
Contact Information: Providing clear contact information for customer support or technical assistance can help users quickly get in touch with the appropriate resources if they have any questions or issues.
Overall, user documentation should be designed to be user-friendly and accessible, with clear instructions and helpful guidance to ensure a positive user experience. By providing comprehensive user documentation, the project team can help ensure that users are able to use the website effectively and achieve their goals, whether it is purchasing trees or learning about tree care.

6. Requirements Analysis and Description

6.1 Requirement Collection

Requirement collection is an important step in developing the desired application. This involves gathering information about the needs of the project stakeholders and defining the specific features and functionality that the website should have. When we collect requirement for the software then we have to consider some key points for the application. We have analysis the user end requirement. Some requirement discussed shortly. To collect the requirements, we have to do meeting with the stakeholders. As well as we can collect requirement from the product champion. They will provide the best and key requirement for the application. Such as some requirement can be for our project is product catalog, Search system, Shopping cart, Payment, Delivery track, Customer support etc.

6.2 Identify Stakeholders

The term stakeholder means that the people or any groups who are affected by a software project. They can be existed in the organization or they can be outside of it as well as they can be the end users. In a word they have an interest in the final product. For our project there might be several types of stakeholders. To develop a incredible project we have to identify the stakeholders cause it is the most important task of requirement analysis. However, if we don't know about the stakeholders then how we can develop a software cause, we don't about the benefitted persons. For our project some stakeholders

might be Customers, Tree sellers, Development team, Marketing team, Payment system providers, Customer service team etc. When we are going to develop the software then we have to consider the stakeholders.

6.3 Labelling Requirements

When the requirement collection process is complete then we have to label them properly. If we label the requirement, we can easily track them. This process increases the requirement traceability attribute. We can easily control the quality of the software also it will help the testing process. We have to properly labeled the requirements for our software to provide a smooth experience to the users.

6.4 Requirements Elicitation

Requirement elicitation is the process of gathering and defining the requirements for a software system. It is an important part of software development as it helps to ensure that the final software product meets the needs of its intended users and stakeholders. Requirement elicitation is an iterative process that requires ongoing communication and collaboration between stakeholders, users, and the development team. By effectively eliciting and managing requirements, software development teams can ensure that the final software product meets the needs of its intended users and stakeholders. There are several process for the requirement elicitation and to develop our software we have perform it as well.

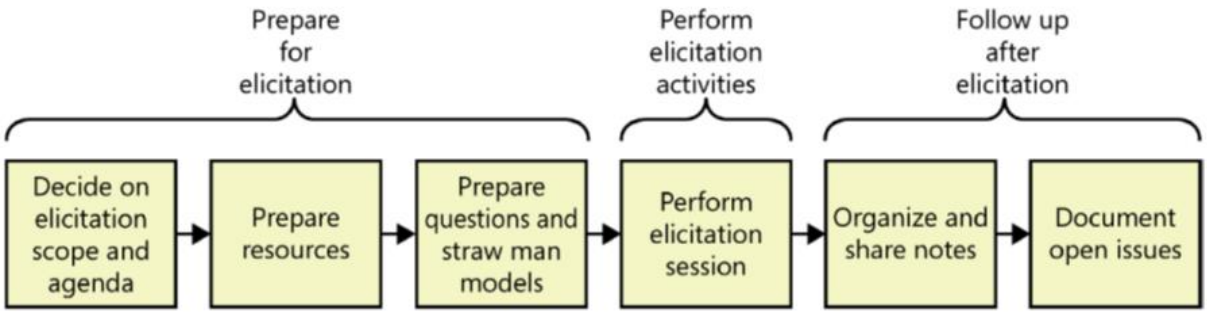


Figure 01: Elicitation Activities

6.5 Requirements Prioritization

Requirement prioritization is the process of organizing software requirements based on their relative importance and urgency. It is a critical step in software requirement analysis as it helps the development team to focus on the most important requirements and ensure that they are implemented first. It provides some help in developing the software such as Ensures focus on the key requirements, Help to manage the resources, Reduces project risk, Support Agile Development etc. The process of prioritization is not a easy task we have to analysis the stakeholders as well as the business goal then we have to provide prioritization value to any requirement. In the meantime, maximum software development process

follows agile development model. In agile model, requirement prioritization is one of most important things. In our project some requirements are more important such as Add to cart, Log in, Registration, Payment etc. Overall, requirement prioritization is an essential step in software development as it helps development teams to focus on the most critical requirements and ensure that the software system meets the needs of its users and stakeholders.

6.6 Requirements Validation

Requirement validation is an important step in the development of any online marketplace, including an online tree mart. It involves reviewing the proposed requirements for the platform and determining whether they align with the needs of the users and the goals of the business. Some key requirements for our application are User registration and login, Tree catalog, Cart and Checkout, Payment Gateway integration, Customer Support etc. We collect all requirement from the potential users, product champions, stakeholders. Once these requirements have been identified, it's important to validate them by consulting with potential users, stakeholders, and subject matter experts. This can help ensure that the platform is designed with the user in mind and meets the business's objectives.

6.7 Analysis the Requirements Incompleteness

Requirements incompleteness in an SRS (Software Requirements Specification) document refers to the situation where the document does not fully collect all the requirements necessary for the successful completion of the project. Sometimes while collecting the requirements, there is a huge possibility some requirement can be missing or failed to find out. Sometimes requirement can be ambiguous where we can not get the main point of the requirement. Sometimes when we analysis the stakeholders on that time we can miss any potential stakeholder. To address requirements incompleteness in an SRS document, it's important to conduct a thorough review of the document and identify any missing, unclear, or inconsistent requirements. This can involve working with stakeholders and subject matter experts to clarify requirements and ensure that they are well-defined, complete, and aligned with the overall goals of the project. Additionally, it may be helpful to use tools such as checklists or templates to ensure that all necessary requirements are included and that they are detailed enough to be actionable by the development team.

7. Business Rules Analysis

Business rules analysis is an important aspect of developing an SRS (Software Requirements Specification) document. Business rules are statements that define or constrain some aspect of the business, and they play an important role in shaping the requirements for the software. We have to understand about the business rules for our project. Business rules also cover the laws of the country. When we are going to develop a software, we have to aware about the laws of the country. Verify all the

requirements based on the business rules. We have to ensure that in our project the business rules are accurate, complete and consistent with the needs of the business. By performing a thorough business rules analysis as part of the SRS development process, it is possible to ensure that the software meets the needs of the business and aligns with its key requirements and constraints.

8. Database Requirement Analysis

Database requirements for Graden AID will depend on the specific functionality and features of the application. However, some common database requirements for out project are discussed below:
Product Catalog: The database should store information about the products available on the website, including details such as product name, description, price, images, and inventory levels.
User Information: The database should store information about users who have registered on the website, including their names, email addresses, shipping and billing addresses, and payment information.
Order Management: The database should store information about orders placed on the website, including details such as order number, customer name, shipping address, order date, and payment status.
Security: The database should ensure data security by implementing encryption, user authentication, access controls, and other security measures.
Backup and Recovery: The database should implement regular backup and recovery procedures to ensure that data is not lost in case of any system failures or disasters.

These are some of the key database requirements for an online tree mart. The specific requirements will vary depending on the scope and complexity of the project. It is important to carefully analyze the requirements and design a database schema that is efficient, secure, and scalable.

9. System Requirements

9.1 System Features

1. Browse the software:

1.1. Anyone can browse the web application as a guest without creating an account.
1.2. When a visitor enters the software, they can browse through different sections of the software.
1.3. They can search for their required trees and get to know about the trees like, type of trees, price and review of other buyers.
1.4. They can see advertisement of fertilizers, free land and the details.
1.5. If they want any kind of interaction, they must log in first if they have account otherwise, they need to sign-up.

Priority Level: High
Precondition: Surf into web

2. Registration of a user profile:

2.1. If the visitors do not have any account, then they need to click on sign-up button which is at the top of the navigation bar. After click, a sign-up webpage will open.
2.2 They have to fill up the registration form with their valid information.
2.3 After filling the information the user needs to click apply button to complete the process.

Priority Level: High
Precondition: Register the user

3. Log in to the Software:

3.1 After completing the registration successfully, user have to go to the login page to login his account.
3.2 User have to give correct user id and password to access his account.
3.3 If user give correct user id and password then he will successfully enter his account otherwise the error message will be displayed.

Priority Level: High
Precondition: Need to verify the username and password.

4. Search for the required trees and items which are related to the trees:

4.1 In the navigation bar there will be a search box for inputs and a button for search.
4.2 If user want to search the required trees or tree related product or free land for gardening, then he needs to click on search bar without giving any keywords, then he needs to type the product.
4.3 After entering any keywords all will show in a grid system on a new web page. He can select or type full name what he wants. 4.4 Then he needs to press enter key. Then the result will be shown.
4.5 Users will be able to sort the products according to Price (High to Low and Low to High), Number of reviews, Alphabets (A-Z and Z-A).
4.6 Users will also be able to filter products according to Categories, Price Range, review etc.

Priority Level: High

5. Buy the products:

5.1 On the products page, there will be a button that says ‘Buy it Now’.
5.2 When users click on that button users will be asked to give delivery details and make payment.
5.3 After a successful payment, the order will be placed and then the software team will deliver the required product.

Priority Level: High
Precondition: Need to add product in cart.

6. Make a payment:

6.1 For payments, there will be two options - Cards and Mobile Banking.
6.2 For cards, the users can make a payment either with credit cards or debit cards.
6.3 When making a payment through cards, the user will be asked to enter the card number, date of expiry, CVC/CVV and card holder name.
6.4 For mobile banking, users will find many options including bKash, Rocket, Nagad, Upay etc.

7. Rate and review the services and sellers:

7.1 After getting the product a message will be sent to the user to give a revies.
7.2 If the user wants, can give a review. He needs to click on review which is available in below the product details or if the user clicks on link which will be sent via text or email then the review page will be open. From there user can give a review with comments about the product.
7.3 Then he needs to click on star to give review then write some comment.
7.4 Then he needs to click on 'Done' or press Enter key to complete the process.

8. Communicate with other users about trees:

8.1 A customer can communicate with the owner of product on the software.
8.2 On the product page, there will be a button to message.
8.3 After clicking on that button a chat box will open on the right side of the web page.
8.4 In the chat users will be able to send messages and pictures etc.
8.5 A user can see all their chats from their profile.

9. Rent free land for gardening:

9.1 In case of free land, on the products page, there will be a button that says 'Borrow it now'.
9.2 In case of borrowing the land, after clicking on 'Borrow it now', it will take the user to the owner page, from there they will able to communicate with each other.
9.3 If user want to borrow then they need to sign in a contract.

9.2 Non-Functional/Quality Requirements

QA1: Performance: Ensuring that the software's homepage loads in less than 4 seconds in all browsers and devices is important for optimizing its performance. This can help improve user

experience, reduce bounce rates, and increase customer satisfaction. To achieve this, it is important to optimize the software's code and images, minimize the use of third-party plugins to reduce load times.

Priority Level: Medium
Precondition: N/A

QA2: Maintainability: Ensuring that the software removes all types of complexities to make changes to the system in the future is important for maintaining its long-term viability and success. This can help reduce the time and resources required to make updates and improvements to the software, and ensure that it remains responsive to changing user needs.

Priority Level: Medium
Precondition: N/A

QA3: Privacy and Security: By using SSL Certificate and data privacy policy can help protect user data and create trust among users. A clear data privacy policy can also help users understand how their data is collected, used, and protected. Only allowing admins to assign roles, approve products, and verify them can help ensure that only authorized personnel have access to sensitive information and critical functions. This can help reduce the risk of errors, fraud, or other security breaches. Implementing measures to prevent DDoS and XSS attacks can help protect the website from malicious attacks that can compromise user data or disrupt service.

Priority Level: High
Precondition: N/A

QA4: Availability: Using a reliable hosting provider and ensuring that the website is hosted on a stable and scalable infrastructure can help ensure that the website is available to customers at all times. Regularly monitoring website performance and uptime can help identify and address any issues that may arise, ensuring that the website remains available and responsive to customer needs.

Priority Level: Medium
Precondition: N/A

QA5: Usability: Providing clear navigation and search functionality can help customers easily find the right products for them. This can include organizing products by category, providing filters and sorting options, and using clear and concise product descriptions. Providing clear and intuitive purchase options, such as a streamlined checkout process and multiple payment options, can help customers easily make a purchase.

Priority Level: Medium
Precondition: N/A

QA6: Efficiency: Using a streamlined checkout process, such as one-click purchasing and multiple payment options, can help reduce the time and effort required for customers to make a purchase, improving efficiency and reducing cart abandonment rates. We can also increase the efficiency of this software by using automation and workflow management tools can help streamline processes and reduce manual effort, improving efficiency and reducing the risk of errors or delays.

Priority Level: Medium
Precondition: N/A

QA7: Interoperability: Implementing data mapping and transformation tools can help ensure that data is properly formatted and structured for different systems and platforms, reducing the risk of errors or data loss and improving interoperability.

Priority Level: Medium
Precondition: N/A

QA8: Flexibility: Providing clear and timely communication to customers and stakeholders can help ensure that the service remains responsive and adaptable to changing needs and requirements, building trust and credibility.

Priority Level: Medium
Precondition: N/A

QA9: Testability: Implementing a comprehensive testing strategy, including unit testing, integration testing, and end-to-end testing, can help identify and address issues before they impact customers, improving the reliability and performance of the system.

Priority Level: Medium
Precondition: N/A

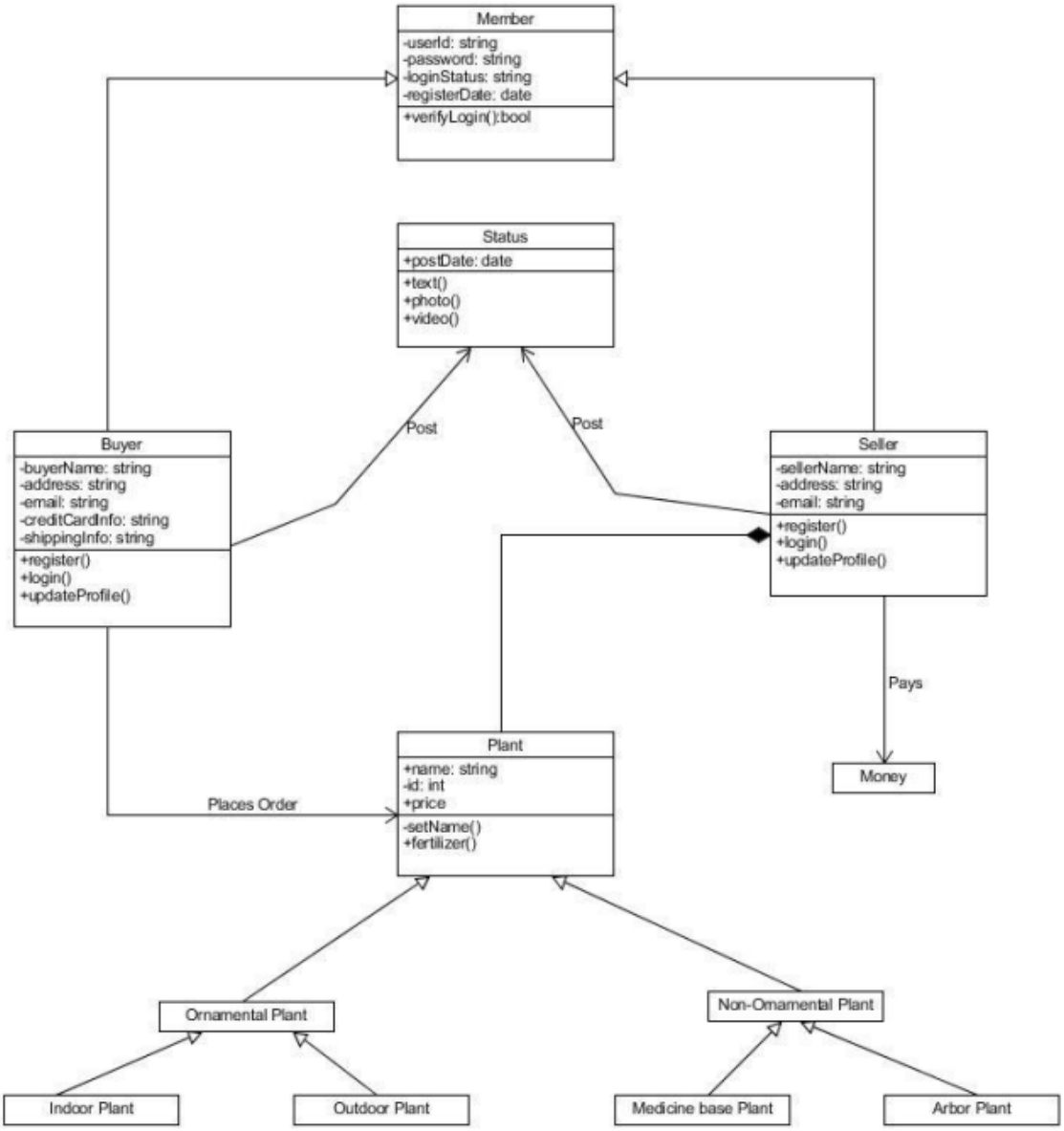
9.3 Project Requirements

To develop a software, we need several types of tools to develop the software. We can discuss as to write code we IDE such as VScode, Visiual Studio, Intellij idea etc. To draw the UML diagram, we need drawio. To run the testing process, we need Jira to do the bug reports as well as to test the software automatically we need Selenium. Sometimes it may require a training session for the developer. There are various types of things which are included with the project requirements.

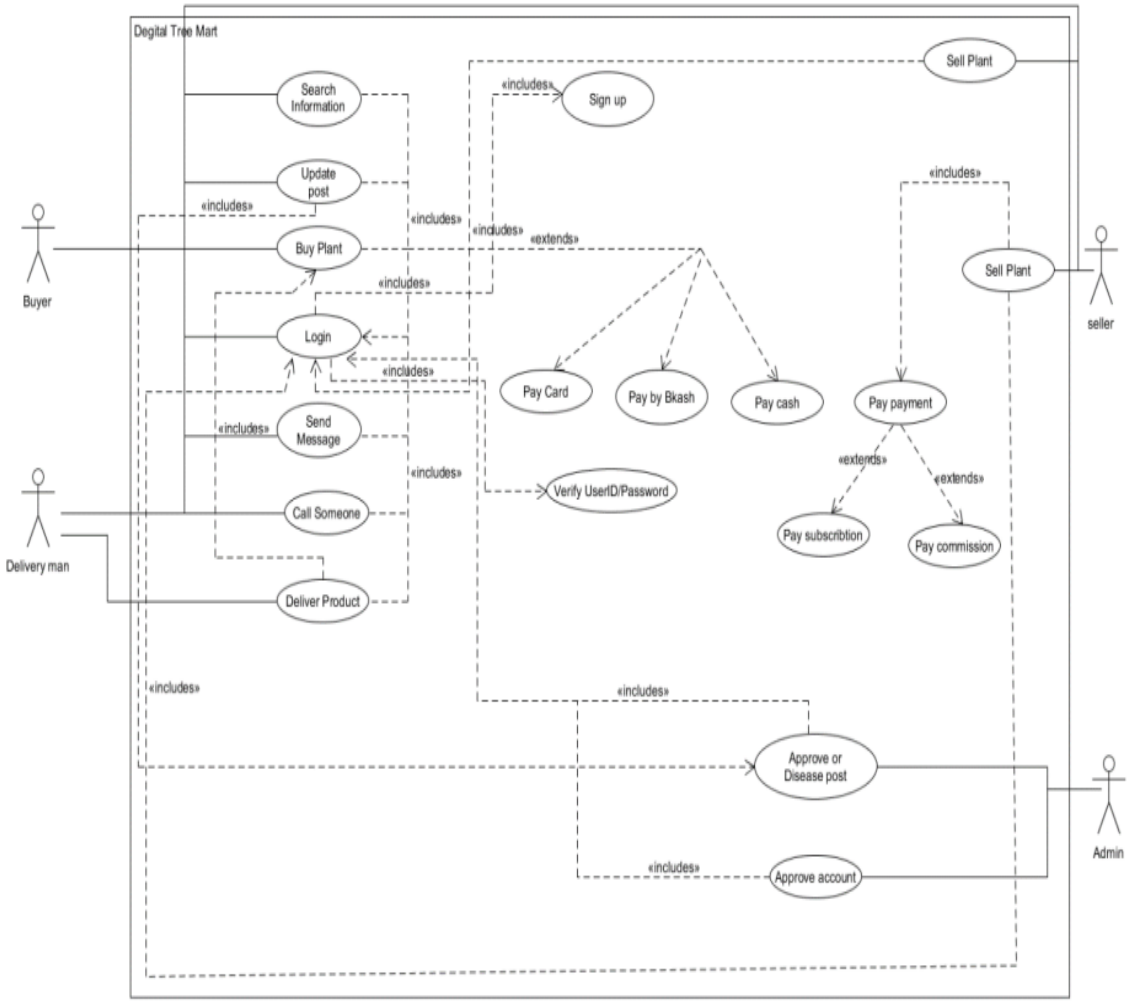
10. Design and Interface Requirements

10.1 UML Diagrams

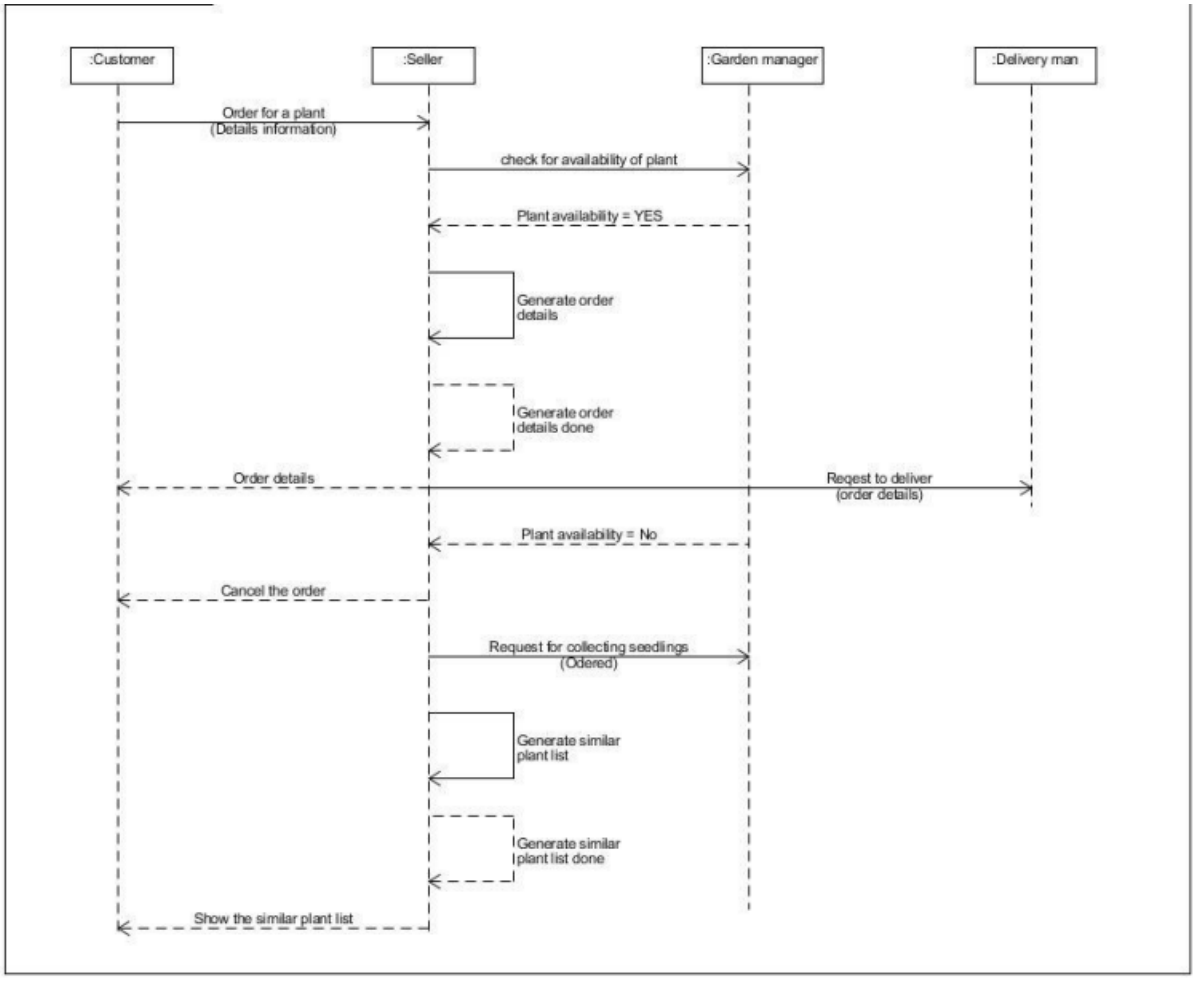
Class Diagram:



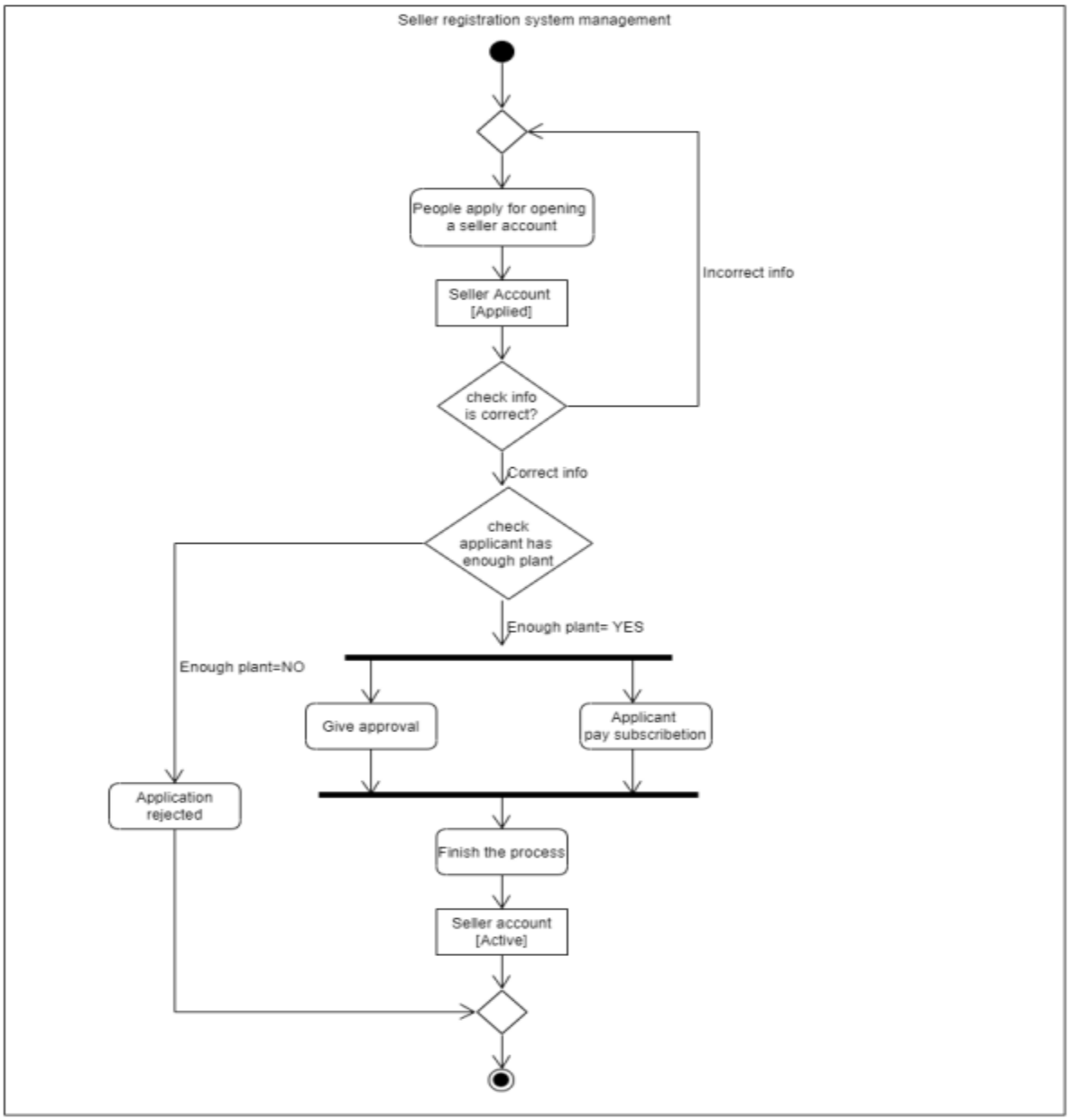
Use Case Diagram:



Sequence Diagram:



Activity Diagram:



10.2 Data Dictionary

Column Name	Data Type	Allow Nulls
First_Name	varchar(40)	☑
Last_Name	varchar(30)	☑
Phone_No	varchar(15)	☑
Email	varchar(80)	☑
Password	varchar(100)	☑
Gander	varchar(8)	☑
Location_Country	varchar(50)	☑
Location_City	varchar(70)	☑
Ac_Type	varchar(10)	☑
Date1	int	☑
Month1	varchar(4)	☑
Year1	int	☑
		☐

Column Name	Data Type	Allow Nulls
country_ID	int	☐
country_Name	varchar(30)	☑
		☐

Column Name	Data Type	Allow Nulls
id	int	☐
Info	varchar(50)	☑
quantity	int	☐
		☐

10.3 UI/UX Design Specification

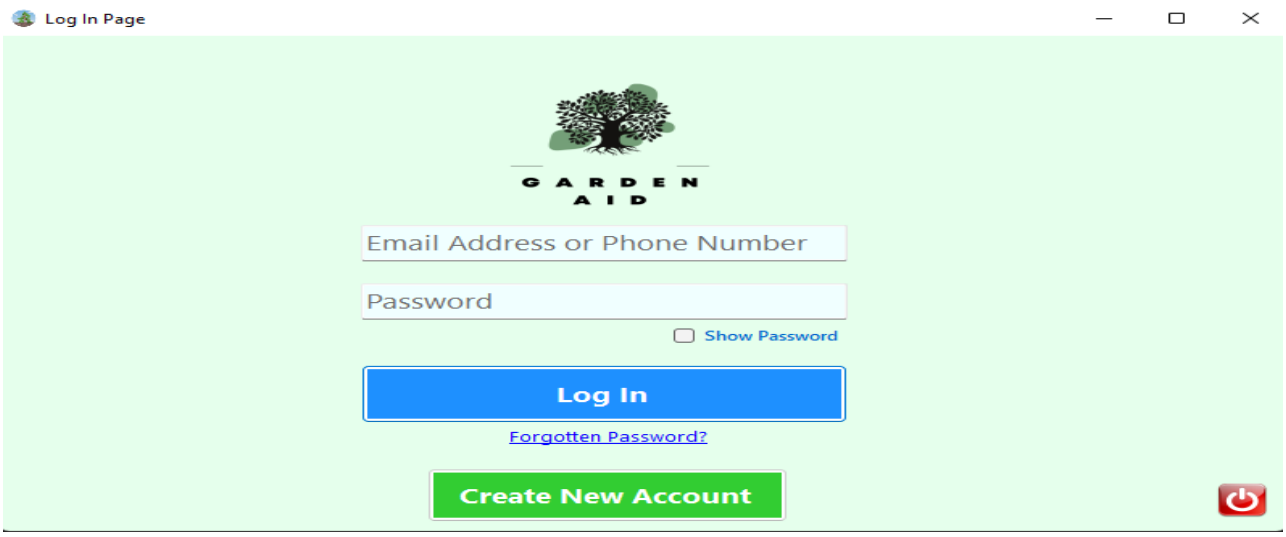


Fig 01: Log in Page

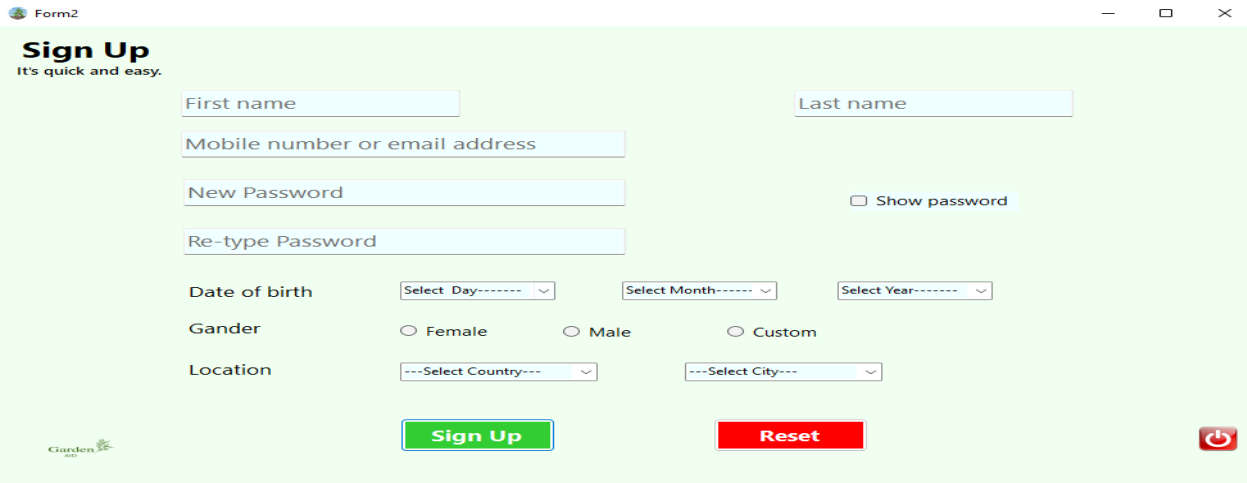


Fig 02: Registration Page

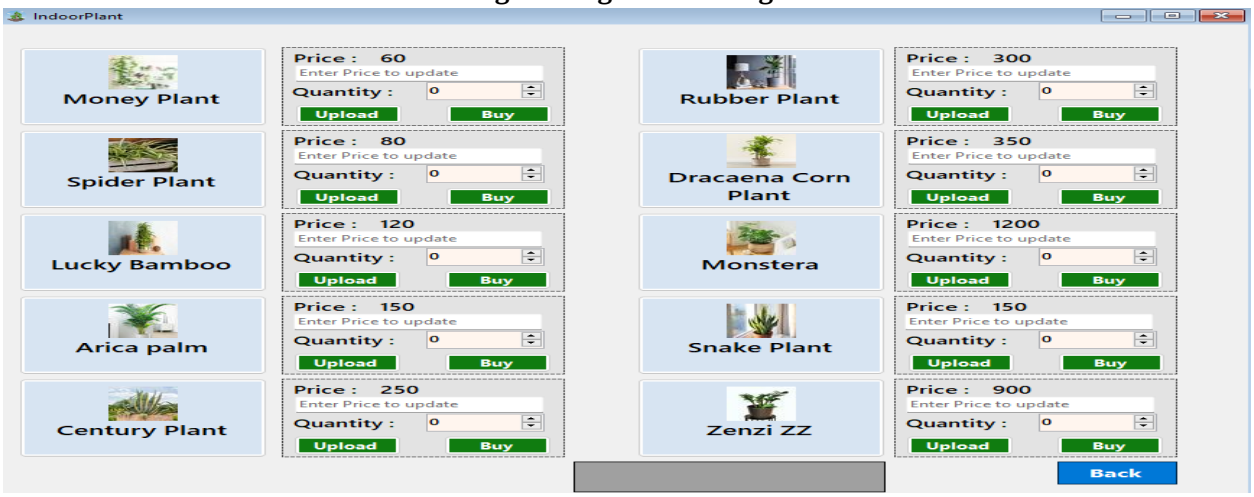


Fig 03: Product Catalog

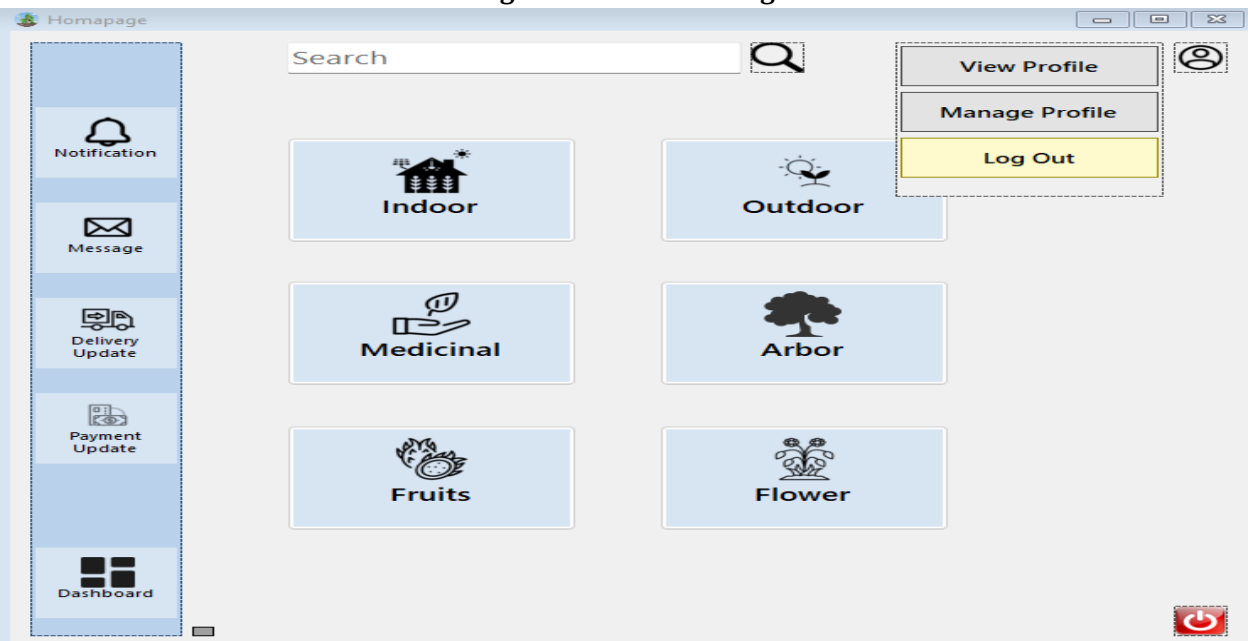


Fig 04: Home Page

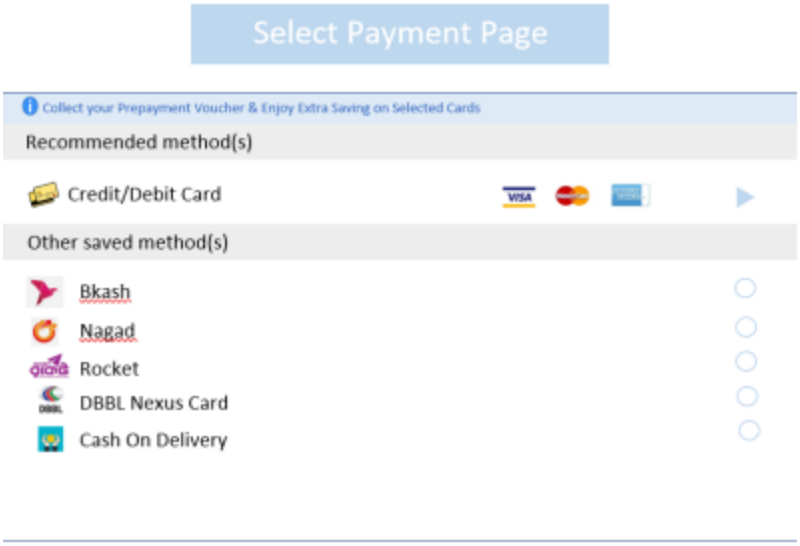
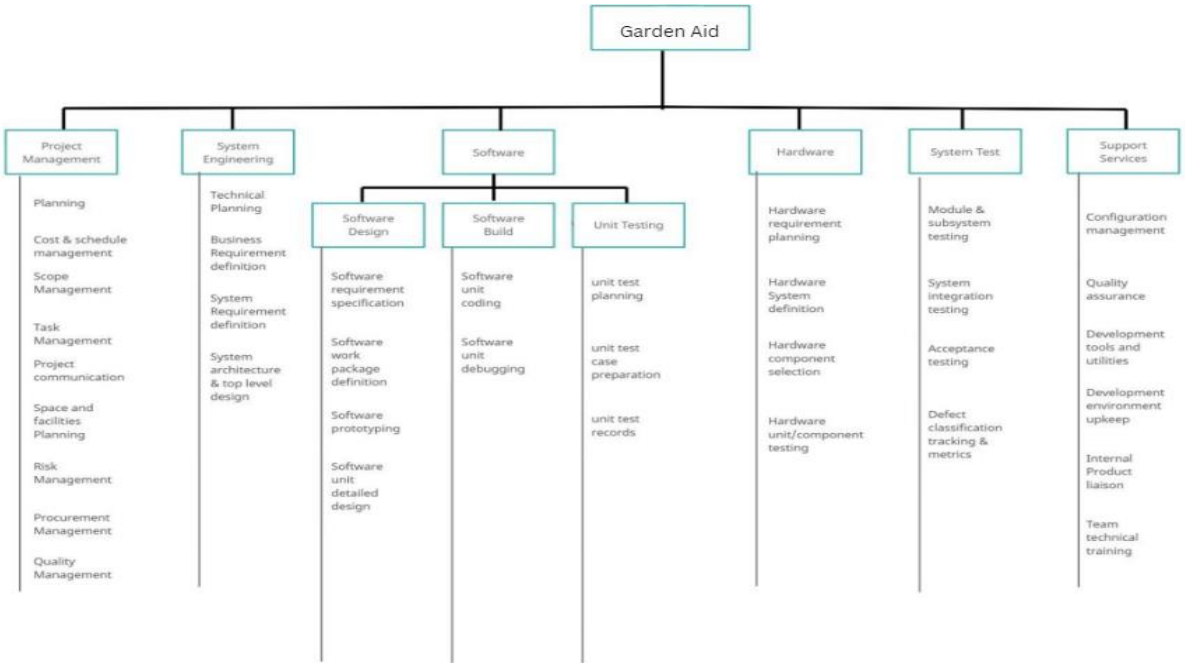


Fig 05: Payment Method Select

11. Project Management

11.1 Project Scheduling Breakdown



11.2 Effort Estimation

Garden AID is a software development project, some potential factors that impact effort estimation include the complexity of the user interface, the level of integration with external systems or APIs and the level of security required to protect user data. Other factors that also impact effort estimation include the development methodology used (e.g., agile), the level of testing required, and the experience and skill level of the development team. Overall, effort estimation for a software development project like garden AID can be complex and require careful planning and coordination to ensure that all necessary factors are taken into account.

11.3 Cost Estimation

Cost estimation for Garden AID software can vary depending on various factors, such as the size and complexity of the software, the development approach, and the scope of the project. Cost estimation: This refers to the process of predicting how much a project or product will cost to develop or produce.

Project scope: The cost of the software will depend on the scope of the project. This includes the features and functionalities required for the software, the user interface, the number of platforms and devices supported, and the scalability requirements.

Development approach: The development approach used can impact the cost of the software. For instance, using an agile development methodology may require more frequent updates and testing, leading to higher costs.

Team size and expertise: The size and expertise of the development team can also impact on the cost of the software. Larger teams and more experienced developers may command higher rates, leading to higher costs.

Maintenance and support: It's important to factor in the ongoing maintenance and support costs of the software, which includes bug fixes, updates, and user support.

11.4 Resource Allocation

As we know that, Resource allocation involves assigning people, time, and other resources to various tasks and activities within a software development project, so this is typically done based on the project requirements, the skills and availability of team members, and the budget and timeline for the project. The aim of resource allocation is to ensure that the right people are working on the right tasks at the right time, and that resources are used effectively and efficiently to meet project goals and objectives and some potential resources that need to be allocated include:

Development team members (e.g., software engineers, UX/UI designers, testers)

Hardware and software tools (e.g., computers, development software, testing tools)

Project management resources (e.g., project managers, agile coaches)

Infrastructure resources (e.g., databases).

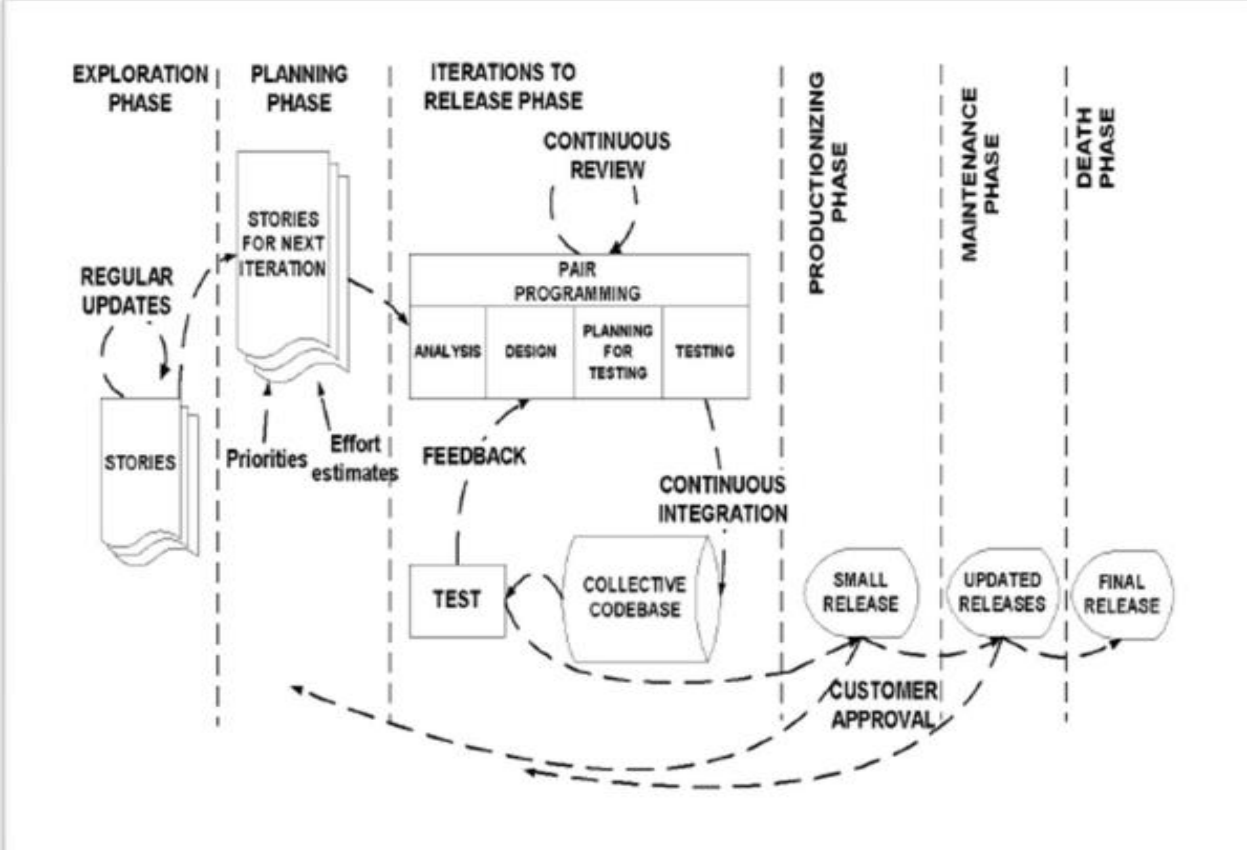
Resource leveling: This involves adjusting the project schedule to ensure that resources are not over-allocated, and that work is spread evenly across the project timeline.

Critical path analysis: This involves identifying the critical path of the project, which is the sequence of tasks that must be completed on time in order for the project to be completed on schedule. Resources are then allocated to these critical tasks to ensure that they are completed on time.

11.5 Risk Analysis

Performing a risk analysis of software is critical for identifying and mitigating potential risks that could impact the performance, reliability, or security of the system. First of all, identify potential risks that could impact the system, such as security vulnerabilities, hardware or software failures, or user errors. Assess the likelihood and impact of each identified risk, using quantitative or qualitative analysis methods to determine the level of risk associated with each. Prioritize risks based on their likelihood and impact, focusing on the most critical risks first. Develop and implement mitigation strategies for each identified risk, such as implementing security measures to prevent data breaches, using redundancy and failover mechanisms to prevent hardware or software failures, or providing user training to reduce the risk of user errors. Regularly review and update the risk analysis and mitigation strategies to ensure that they remain effective and up to date.

12. SDLC Model Description



XP model mainly focused on unit testing and several kinds of testing also occurs that's why the software which follows the XP model faces less bugs and errors than other model base software. XP is faster and time efficient and this XP model greatly focus highly prioritize featured of a software. In XP model all types of work or all types of developments runs parallelly every time. The great advantage of this model is that we don't redo works but updates according to customers requirement or desire. And we don't need to start again like other models. When it's released but even after that it never stop analysing and like usually it detects the bug and solve the problem.

13. Testcase Analysis and Description

Garden AID is an e-commerce software that specializes in selling trees, plants, and gardening supplies. The software is designed to provide a hassle-free shopping experience to its customers. In this test case analysis, we will be discussing the various test scenarios that must be considered to ensure the smooth functioning of the software.

Test Scenarios:
Software Navigation: The software navigation must be smooth and easy to use. Testers must ensure that all the links and buttons are working correctly, and the software pages are loading quickly.

Search Functionality: The search functionality is a crucial aspect of the software Testers must ensure that the search feature is working correctly and returning relevant results. They must also verify that the search feature is accessible and easy to use.

Product Display: The software must display all products in a clear and organized manner. Testers must verify that the products are displayed with accurate descriptions, pricing, and images. They must also ensure that the product categories are well-defined and easy to navigate.

Checkout Process: The checkout process is a critical aspect of the software. Testers must ensure that the checkout process is easy to use, and all the required information is collected accurately. They must also verify that the payment process is secure and reliable.

Mobile Responsiveness: In today's world, many users access software using their mobile devices. Testers must ensure that the software is mobile responsive and works seamlessly on all screen sizes. They must verify that the software pages are loading quickly and that all the functionality is accessible on mobile devices.

Performance: The software performance is critical to providing a good user experience. Testers must ensure that the software pages are loading quickly and that there are no errors or bugs.

Security: Security is a crucial aspect of any e-commerce software. Testers must ensure that the software is secure and that customer information is protected. They must verify that the software has an SSL certificate and that all transactions are encrypted.

14. Verification and Validation

Verification: Verification is the process of reviewing the SRS to ensure that it accurately and completely captures the requirements of the software. The purpose of verification is to identify and resolve any inconsistencies, errors, or ambiguities in the SRS before the development of the software begins. Verification activities may include peer reviews, walkthroughs, and inspections of the SRS.
Validation: Validation is the process of ensuring that the requirements in the SRS meet the needs of the stakeholders and are aligned with the goals and objectives of the project. The purpose of validation is to ensure that the software will meet the requirements and expectations of the stakeholders. Validation activities may include user acceptance testing, requirements traceability, and stakeholder reviews of the SRS.

15. Testing

15.1 Unit Testing

Unit testing is a software testing technique in which individual units or components of a software application are tested in isolation from the rest of the system. The purpose of unit testing is to verify that each unit or component of the software application performs as expected and to detect and fix defects early in the development process. Unit testing is typically done by developers during the development phase. In a typical unit testing process, the developer writes a test case for a specific unit or component of the application. The test case specifies the inputs to the unit, the expected output, and any other relevant conditions. The developer then executes the test case and verifies that the actual output matches the expected output. If there are any discrepancies, the developer debugs the code to identify and fix the issue.

15.2 Integration Testing

Integration testing is a software testing technique in which multiple modules or components of a software application are tested together to verify that they work as expected and integrate correctly with each other. The purpose of integration testing is to identify any defects or issues that may arise due to the interaction between different modules or components of the application. Integration testing is an essential aspect of software development. It helps to detect and fix defects that may arise due to the interaction between different modules or components of the application. By using integration testing in a project, developers can ensure that the software application functions as expected and meets the requirements of the stakeholders.

15.3 System Testing

System testing is a software testing technique in which a complete and fully integrated software application is tested to verify that it meets the specified requirements and functions as expected. The purpose of system testing is to identify any defects or issues that may arise due to the interaction between different components of the system. System testing is an important aspect of software development. It helps to ensure that the software application meets the specified requirements and functions as expected. By using system testing in a project, developers can ensure that the software application is of high quality and meets the needs of the stakeholders.

15.4 Acceptance Testing

Acceptance testing is a software testing technique in which a software application is tested for its acceptance by the stakeholders, including the end-users and clients. The purpose of acceptance testing is to verify that the software application meets the business requirements and is ready for deployment. Acceptance testing is a critical aspect of software development. It helps to ensure that the software application meets the business requirements and is ready for deployment. By using acceptance testing

in a project, developers can ensure that the software application is of high quality and meets the needs of the stakeholders.

15.5 Regression Testing

Regression testing is a software testing technique that is used to verify that changes or modifications made to a software application have not introduced new defects or caused existing defects to reoccur. The purpose of regression testing is to ensure that the software application continues to function as expected after changes have been made. Regression testing is an important aspect of software development. It helps to ensure that the software application continues to function as expected after changes have been made. By using regression testing in a project, developers can ensure that the software application is of high quality and meets the needs of the stakeholders.

15.6 Smoke Testing

Smoke testing is a software testing technique that is used to conduct a quick and shallow set of tests to determine if a build or release is stable enough for further testing. The purpose of smoke testing is to check if the critical functionalities of the application are working as expected before proceeding with more detailed testing. Smoke testing is a critical aspect of software development. It helps to ensure that the critical functionalities of the software application are working as expected before proceeding with more detailed testing. By using smoke testing in a project, developers can ensure that the software application is stable and ready for further testing.

15.7 White Box Testing

White box testing is a software testing technique that focuses on testing the internal workings of a software application, including its code, structure, and algorithms. The purpose of white box testing is to ensure that the software application is functioning correctly at the code level. White box testing is a critical aspect of software development. It helps to ensure that the code is correct and meets the coding standards, the software application's structure and architecture is sound, and the software application performs well at the code level. By using white box testing in a project, developers can ensure that the software application is of high quality and meets the needs of the stakeholders.

15.8 Black Box Testing

Black box testing is a software testing technique that focuses on testing the functionality of a software application without any knowledge of its internal workings or code. The purpose of black box testing is to ensure that the software application meets the requirements and specifications and behaves as expected from the end user's perspective. Black box testing is an important aspect of software development. It helps to ensure that the software application meets the requirements and specifications and behaves as expected from the end user's perspective. By using black box testing in a project, developers can ensure that the software application is of high quality and meets the needs of the stakeholders.

16. Requirement Change Management

Software requirement specification (SRS) is a formal document that outlines the requirements for a software system. The process of requirement change management in SRS involves managing any changes made to the requirements throughout the software development lifecycle.

Record all changes: All changes to the requirements should be recorded in a change log. The change log should include information such as the date of the change, who made the change, the reason for the change, and the impact of the change on the project.

Update the SRS: The SRS document should be updated to reflect the approved changes. This updated version of the SRS should be reviewed and approved by all stakeholders.

Test the changes: Any changes made to the requirements should be tested to ensure that they have been implemented correctly and that they meet the expected results.

By following these steps, you can effectively manage changes to the requirements in the SRS document, which can help ensure that the software system meets the needs of the stakeholders.

17. Ethical Rules Analysis

As a responsible development team, we really care about the ethical and professional conduct in our working environment. We maintain the highest standards of integrity to maintain the ethical rules. Here is a short brief of some code of ethics:

Health and Safety: As a professional person we have to ensure health and safety for a safe and healthy work environment as well as for the stakeholders. All the ethical rules direct us to maintain health and safety. So, during development we have to ensure the health and safety and we have to aware about this.

Be honest and trustworthy: This rule will make an employee honest and trustworthy. To work in an institution, employees need to be honest to build a positive environment in the workplace and if employee is not trustworthy then how a company relay on him. So, during the development phase we have to be honest and trustworthy and consider that software should be trustworthy for the users.

Respect privacy and individuals: In this rule, there is two types of things. First one is companies have their own privacy such as projects, data, policies etc. An employee needs to be respectful to that type of privacy. In the workplace there are various types of people are working together. So that everyone needs to show respect to each other.

Maintain transparency: In a company all employees need to maintain different types of deals. As a working professional, every need to be transparent to their any kind of works or any kind of deals. There will be no ambiguity.

Compliance with laws and regulations: As our software serve locally than we have to be aware about the local laws and business rules. If we want to do any work than we have to aware about the laws by the

government. Every employee needs to know the business rules and laws as well as if we transform to work in globally then we have to follow the international standards.

18. References

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