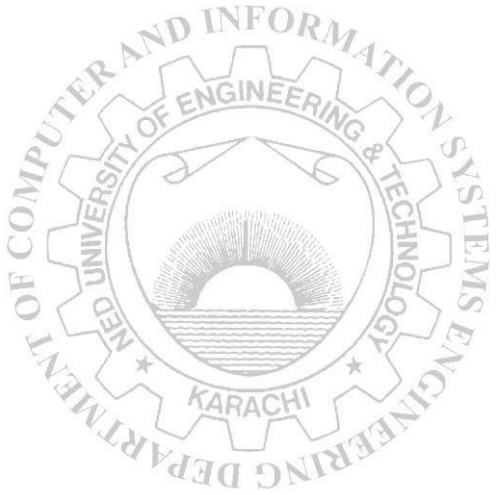
Software Requirements Specification

for

Nursery



Management System

Version 1.0

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DATE:20TH JANUARY 2021

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1 Introduction

1.1 Document Purpose

The Software Requirements Specification is prepared to document and describe the agreement between the customer and the developer about the specification of the software product required. This Software Requirement Specification (SRS) Document provides comprehensive description of all the functionalities and specification of this system called as "Automated Nursery Management System". It explains all the features, attributes, interfaces as well as purpose of the system and constraints. This document is divided into number of logical sections and subsections , and can easily be used for further development of the system.

1.2 Product Scope

Majorly, this system pertains to sales and record management system features that belongs to a plant store. This system is designed for automating the system used in a shop for all concerned operations. Generally, the whole process of sales, keeping records of stocks, calculation of bills ,customer history, transactions are being done manually and this system aims to eliminate the manual handling of these activities by making it fully secured, safe, efficient more emphasizing automated.
This system will not only automate system for the customers but also for those who are the owners as it will also provide features of CRUD operations.
The most highlighting feature is Barcode scanning of product, the customer after seeing all the item when comes to buy at billing section, he or she will have to show the barcode of each **Plant** which he or she want to buy , the system scans it and show all details stored in it via database. Then finally customer can automatically calculate its bill on machine and gets print of receipt as soon payment is made.

1.3 Intended Audience and Document Overview

The intended audience of this document is our primary Nursery Management System customer, Nursery Management System Administration, Dr. Shehnilla Zardari, the instructor, the fall semester 2020 SE Group 2 members, System Maintenance Engineer ,system designer, system developer, as well as the other students attending that will require access to such documentation.

This document starts with Introduction section defining the goals, purpose &scope of product following that second section starts of General Description, comprehensively portraying the user characteristics, product's perspective, functionalities, constraints of the product then comes third section of Specific Requirements proficiently describing the Functional and Non–Functional requirements of the system while documents end with section showing all other vital supplements.

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1.4 Definitions, Acronyms and Abbreviations

Barcode	**A unique identifier assigned to single items**
BCR	**Barcode Reader**
Button	**An element of user element that allows a user to select and inform the system to perform any measure or action**
Configuration	**Item which is available or selected from a menu or catalogue can be customized.**
CRUD	**Create, Retrieve, Update, Delete**
DB	**Database**
IDE	**Integrated Development Environment**
Inventory	**An object that holds items available for purchase by the Customer**
ISP	**Internet Service Provider**
Item	**A product or Individual identity in the inventory available to buy.**
MS	**Microsoft**
Mbps	**Mega bytes per second**
SQL	**Structured Query Language**
SRS	**Software Requirements Specification**

System Administrator	**The individual that has the ability to create, retrieve, update and delete items in the store. This person don't have the right to act as a Customer and Manager on same time.**

Transaction	**The info regarding to a customer's purchase that is recorded**
User	**The person who interact or use the software product.**
VS	**Visual Studio**

1.5 Document Conventions

Font used: Times New Roman 12
Headings: Arial 14
Sub Headings: Arial 14

1.6 References and Acknowledgments

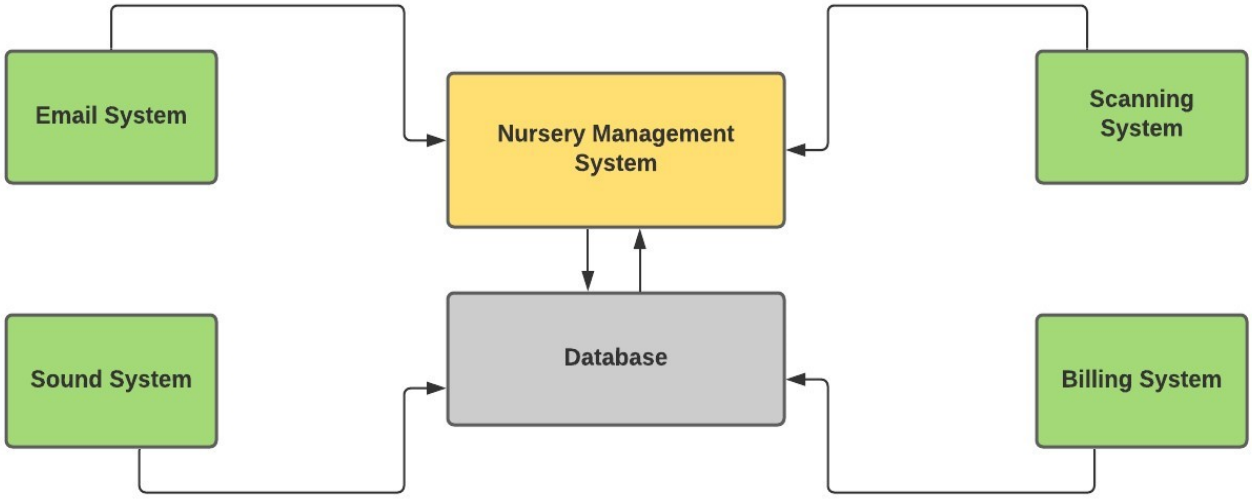
The references are:

- https://www.cse.msu.edu/~chengb/RE-491/Papers/SRS-BECS-2007.pdf
- *https://opus.govst.edu/cgi/viewcontent.cgi?article=1156&context=capstones*

2 Overall Description

2.1 Product Perspective:

The Nursery Management System is basically a complete onsite sales management system connected with a database for a shop management and customers, developed with the aim to reduce all sort of manual working involved. The system deals with the information handling that includes the displaying the items, status of stocks, bill processing connected with a central database in order to delete, update, insert and retrieval of information. **Context Diagram** shows the perspective of the system as follows:



Apart from this the most highlighting feature that tends for the automation is the barcode scanning and subsequently performing all the operations automatically after the validating the concerns. It also incorporates the security perspective by only allowing certain stakeholders access to certain areas of system. It has also made keeping in mind the needs of handicapped people, having audio and visual aids installed in it.

2.2 Product Functionalities

The detailed explanation of specific requirements of the system is given in later sections(section 3.2) whereas the following is the overview of functionalities of the system:

2.2.1 Registration:

System will allow user to register themselves if their interaction with the system is for the first time.

2.2.2 Login

System will ask user to log in the system by giving desired credentials before proceeding further.

2.2.3 Displaying Products:

System will display all categorize of plants as well as their varieties to the customer

2.2.4 CRUD Operations

System will allow system administrator to access database and perform (CRUD) insert, delete, update operations.

2.2.5 Scanning via Barcode:

The system will be able to scan and configure product details just by scanning the barcode. System will show all details retrieved from database.

2.2.6 Billing Section:

System will automatically calculate bills and can also print the bill/receipt after shopping items.

2.2.7 Feature for handicapped Persons:

System also incorporates voice reading of customer's transaction info while it can also produce sounds after successful scanning of barcodes.

2.2.8 Email System:

The system can allow user to send queries by sending amd receiving emails in contact us menu.

2.3 Users and Characteristics

2.3.1 For Manager:

2.3.1.1 System will allow access to View the records and status of stocks and users.

2.3.2 For System Administrator:

2.3.2.1 System will allow only to him/ her to have access to database.

2.3.2.2 System will allow to Insert data

2.3.2.3 System will allow to Delete data.

2.3.2.4 System will allow to Update data.

2.3.3 New Customer:

2.3.3.1 System will display Sign up option that can be only be used by new customer.

2.3.3.2 System will ask login credentials will be used first before further operation.

2.3.3.3 System will allow displaying items

2.3.3.4 System will allow calculating bill feature to be used.

2.3.3.5 System will allow Speech system feature to be used.

2.3.3.6 System will allow Barcode scanning feature to be used.

2.3.3.7 System will allow Contact us option feature to be used.

2.4 Operating Environment

The system can work efficiently when its following requirements are fulfilled in concern with the environment:

- Platform : Windows 8 or latest, Mac OS, Linux/Unix • Display : Minimum 20" Inches Screen with Toch support.
- Scanning : Minimum 72 MP camera
- Sound : Theatre Speakers
- Internet : 10 Mbps Internet Connection Required 24/7

From development perspective the coding is being done on **C#** environment as requested, the database used for the system is **SQL**, the development platform or IDE is **MS Visual Studio**.

2.5 Design and Implementation Constraints

2.5.1 As stated by the customer, strong password is not a concern for this system. The database may store passwords in plain text that, in general can easily be targeted by attackers.

2.5.2 Compromise in budget allocation for scanning device quality can hinder the accuracy of that component.

2.5.3 The system might not send email on time if internet is not connected 24/7.

2.5.4 Low volume of speaker can make difficult to hear beep sound Of machine on successful scanning.

2.5.5 Only the Admin can access the whole system

2.5.6 A unique ID and password is assigned to every user

2.5.7 It is assumed that the Administrator and Manager will have enough trained staff to manage and operate the system

2.6 User Documentation

A guideline sheet named as “Hey ! How to use me” is dispatched along with the product,that should be pasted beside the system in order to let end user not to get confuse at any stage.

2.7 Assumptions and Dependencies

Assumptions:

Client:

We have assumed that all of the computer systems in the shops are in proper condition for operating and that the user is capable of operating these system's basic functions including but not limited to being able to power on the system, login and understanding messages.

Provider:

We have assumed that the system will be running on a properly working web server and database system with an Internet connection that allows this system to perform all communications with clients.

Dependencies:

- The manager account’s username and password maybe hard coded.
- The manager cannot be a customer. Any user cannot edit their account information.
- Product detection is dependent upon accurate working of barcode scanner.
- Customer validation is dependant upon access to database..
- After system is being locked , the next try of login will be based upon timer set. Email receiving is dependant on correct entering of data.
- Email sending is dependant upon internet connectivity
- Detection of barcode is signalled by sound beep depending upon the working of speakers.

3 Specific Requirements

3.1 External Interface Requirements

3.1.1 User Interfaces

There are two major sections

- Products
- Billing section

On products session different types of plants with their details are shown . the customer can see the details, price and where are they placed in nursery through this session.

The second session is for billing the user first log in to the system if he/she comes first time than they need to sign up after that billing window appear here they first scan their barcode id than products barcode and after payment they can print their bill The user interface should be implemented using C#

3.1.2 Hardware Interfaces

- For scanning barcode a camera of 72 MP would be used.
- For printing bill a laser jet printer would be used.
- A 20” screen with touch support would be used to display GUI of system.
- A sound system required for voice of bill.

3.1.3 Software Interfaces

- Mysql will be used to store customer information and nursery item information.
- The user interface should be implemented using C#.
- Photocam library will be included for capturing barcode. Zhengwen library will be included for reading barcode.

3.1.4 Communications Interfaces

The Simple Mail Transfer Protocol (SMTP) is used for taking feedback from customers through e-mail.

3.2 Functional Requirements

3.2.1 Registration/Sign Up:

3.2.1.1 System shall display the registration page for customer coming first time to store.

3.2.1.2 System shall register the customer using for the first time by asking name age address password email address.

3.2.1.3 System will display message after successful registration.

3.2.1.4 System will issue customer the unique ID and register him/her by that in database.

3.2.1.5 System will save all that user given information in the database.

3.2.1.6 System will display message of "Incomplete Details" if the user doesn't enter any requires information.

3.2.1.7 System will display message of "Already registered" if the user is already registered in the database.

3.2.2 Login system:

3.2.2.1 System shall display the Login page for customer.

3.2.2.2 System will ask to provide email address and password to the customer.

3.2.2.3 System will check the given id and password.

3.2.2.4 If the validation is successful it will display a messege "login successful".

3.2.2.5 If validation fails it will give another try(try limits=3)

3.2.2.6 If customer enters the desired information wrong for for the third time it will give the warning message and system will be locked.

3.2.2.7 System will ask username and password on system administrator login page.

3.2.2.8 System will give three try for entering correct information.

3.2.2.9 System will start timer for 5 minutes ,making sytem locked after third wrong entrance of credentials.

3.2.3 Timer:

3.2.3.1 System will run a timer for 5 minutes after system gets locked due to wrong enrtrance of information.

3.2.4 Printing of Bill:

3.2.4.1 System will print the bill/receipt of custmers buying product information as soon as thr user clicks the print receipt button**.**

3.2.5 Speech System:

3.2.5.1 System will be telling bill in audio format when user presses the button for speech**.**

3.2.6 Insert Record:

3.2.6.1 System will allow managers/system administrator to Insert the records in database.

3.2.7 Update Record:

3.2.7.1 System will allow managers/system administrator to Update the records in database.

3.2.8 Delete Record:

3.2.8.1 System will allow managers/system administrator to Delete the records in database

3.2.9 View Record:

3.2.9.1 System will allow managers/system administrator to View the records of all customers & stocks in database.

3.2.9.2 System will allow customers to View the records of only their interaction history in database**.**

3.2.10 Displaying Items:

3.2.10.1 After successful login/sign up system will display all the Categories of plants to customers.

3.2.10.2 If customer selects option of varieties in any category of plants system will display all its varieties.

3.2.10.3 System will display options for calculating bill, scan barcode, contact us to the user.

3.2.11 Contact Us:

3.2.11.1 System will display Contact Us page to user as user clicks Contact us button.

3.2.11.2 System will ask for email of the user.

3.2.11.3 System will ask the user to enter query/recommendations to the users.

3.2.11.4 System then stores that concern to the database by reference of that customer.

3.2.11.5 System will send email of confirmation of receiving their query.

3.2.12 Scanning Barcode:

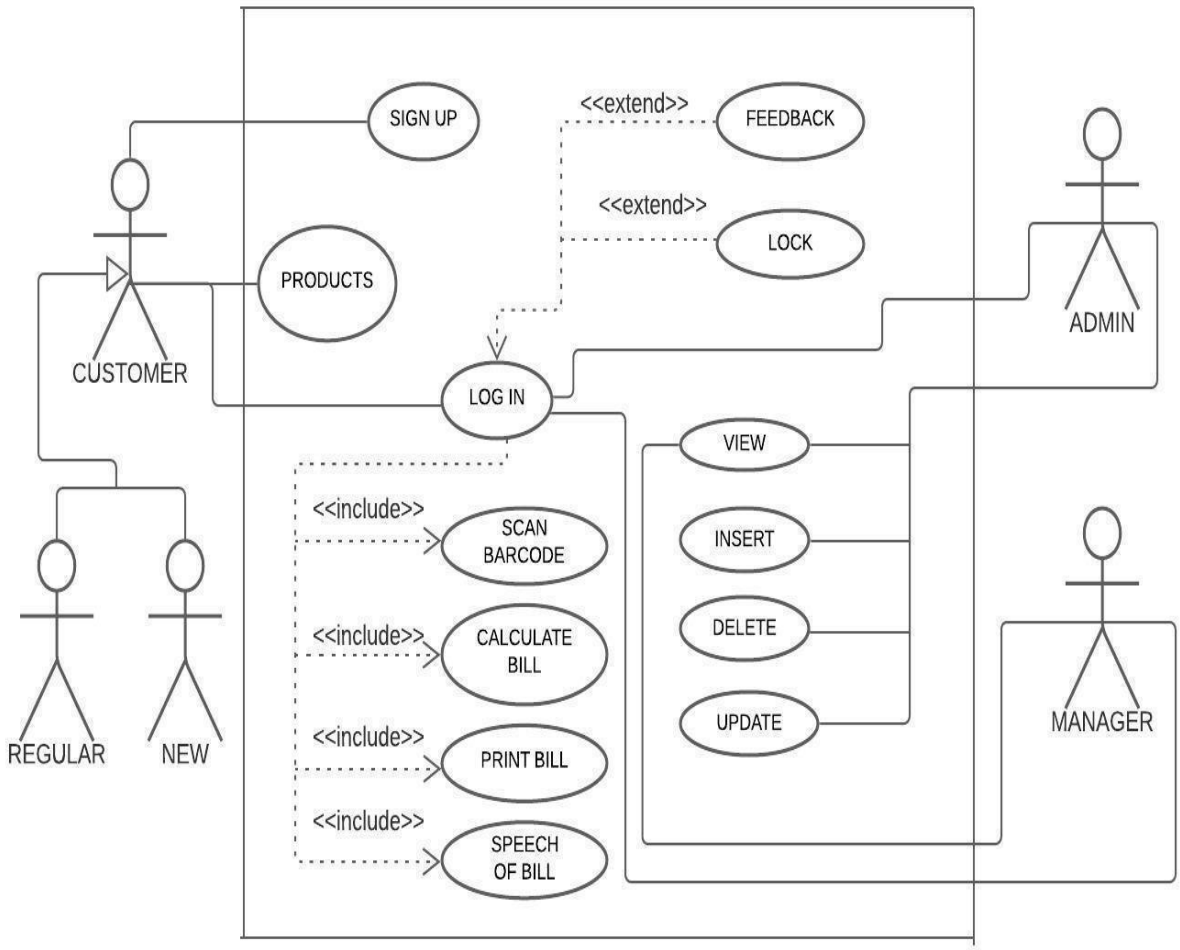
3.2.12.1 System will open the scanner as the user clicks the Scan Code button.

3.2.12.2 System will give message to sound system after successful scanning.

3.2.12.3 System will show all details retrieved from database of product on screen after the item's Barcode has been successfully scanned.

3.3 Behaviour Requirements

3.3.1 Use Case View:



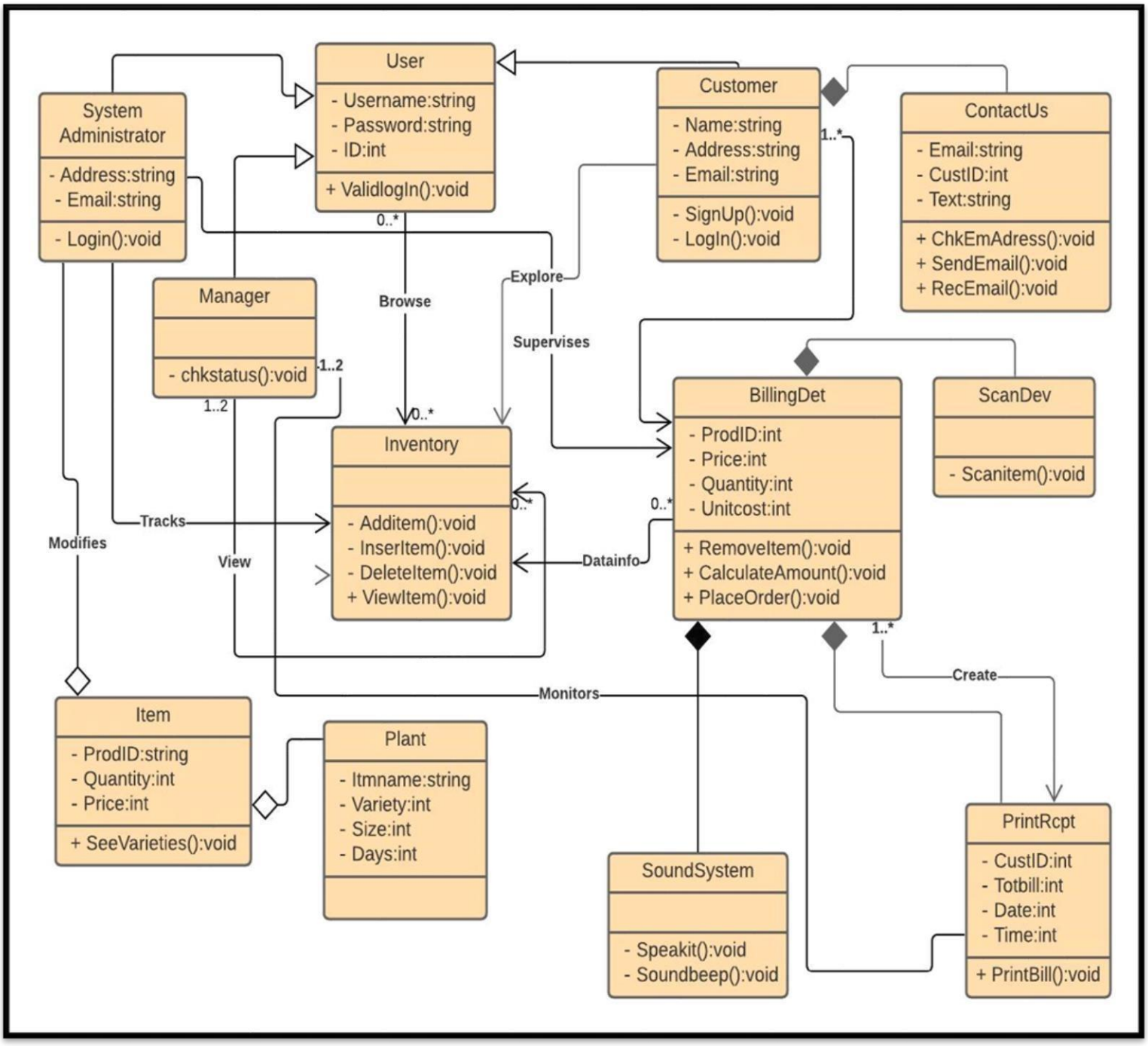
3.4 Class Based Diagram:

Classes	Rectangles in the diagram that are divided into three parts. The top section is the name of the class, the section in the middle is the list of variables(attributes) stored in the class and the bottom section is the list of functions or behaviours in the class. Actually rectangles represent objects within the system.

Attributes	These have a name followed by a colon and then a datatype. They are variables.

Behaviours	These are the name of function receives in-between the parenthesis "()".
Generalization	Shown by a line from one object to the other object with an empty triangle on one end. The object without the triangle inherits the behaviours and attributes from the object that has the triangle pointing towards it.
Aggregation	Lines that have an unfilled diamond on one end. This means the object with the diamond has the object(s) as their parts without the diamond.
Associations	Lines joining two classes that can have a name beside it, might point in one direction, and may have (multiplicities). They depicts some relationship between the objects.
Multiplicities	Numbers that are may be on the ends of Aggregations and Associations The first number is the minimum one and the second number is the maximum. An asterisk '* is used to denote many. If there is no number written it is assumed to be 1.

The aim of this diagram is to show how the objects will interact with each other in the Nursery Management System in order to adopt the functionalities of as described in use case also:


User
- Username:string
- Password:string
- ID:int
+ ValidlogIn():void
System Administrator
- Address:string
- Email:string
- Login():void
Customer
- Name:string
- Address:string
- Email:string
- SignUp():void
- LogIn():void
ContactUs
- Email:string
- CustID:int
- Text:string
+ ChkEmAdress():void
+ SendEmail():void
+ RecEmail():void
Manager
- chkstatus():void
Browse
Explore
Supervises
Inventory
- Additem():void
- InserItem():void
- DeleteItem():void
+ ViewItem():void
BillingDet
- ProdID:int
- Price:int
- Quantity:int
- Unitcost:int
+ RemoveItem():void
+ CalculateAmount():void
+ PlaceOrder():void
ScanDev
- Scanitem():void
Tracks
Modifies
View
Datainfo
Monitors
Create
Item
- ProdID:string
- Quantity:int
- Price:int
+ SeeVarieties():void
Plant
- Itmname:string
- Variety:int
- Size:int
- Days:int
SoundSystem
- Speakit():void
- Soundbeep():void
PrintRcpt
- CustID:int
- Totbill:int
- Date:int
- Time:int
+ PrintBill():void
0..*
1..*
1..2

4 Non-functional Requirements

4.1 Performance Requirements

Except feedback form the product would not take much time to execute as it is deploy on the system and running time depends on the system specifications . The product will take time to read the barcode as most of the times the code is not clear so this may happen. Overall the performance depend on system specifications and clarity of barcodes and for feedback form the performance depends on speed of internet.

4.2 Safety and Security Requirements

SAFETY REQUIREMENTS :

If there is any type of system or hardware failure the system should make a copy of last updated DB on the disk

SECURITY REQUIREMENTS :

The system should make secure by taking the necessary steps both at the front end and the back end

4.2.1 The system shall automatically log out customer after the printing of bill.

4.2.2 When user is entering password it should not visible instead of that '*' will appear

4.2.3 The system should provide unique ID to every customer

4.2.4 Except admin no one have the access to see other's profile.

4.2.5 If admin provide wrong password thrice or if he/she forgets the password than password would be change through e-mail verification

4.2.6 User password should be case sensitive and must include an at least one upper and lower case character with the minimum length of 8 characters

4.2.7 The system's back-end databases shall only be accessible to authenticated administrator.

4.2.8 The system's back-end databases shall be encrypted.

4.3 Software Quality Attributes

4.3.1 MAINTAINABILITY :

4.3.1.1 The developed system is maintainable and further change in requirements can easily be implemented in the incoming development iterations.

4.3.1.2 Regular refactoring of the code is done to make the code much cleaner and easier to maintain.

4.3.1.3 All the redundant components and elements of the system are removed regularly.

4.3.2 PORTABILITY :

The system should run on the environment that is having a stable internet connection and fulfill the system specifications as mentioned in the **3.1.2**

4.3.3 USABILITY :

The system should be easy to use and simple to understand . A user from any kind of background can use the system

4.3.4 RESPONSIVE :

4.3.4.1 For barcode scanning the system would take up to 3 seconds.

4.3.4.2 Bill would be print in 2 second.

4.3.4.3 Other operation would be execute in less than a second

4.3.5 FLEXIBILITY :

4.3.5.1 The system should easy to modify if any if any requirement change.

4.3.6 RELIABILITY :

4.3.6.1 The system should not be subject to failure and the recovery time from failure should be minimize.

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Appendix A – Glossary

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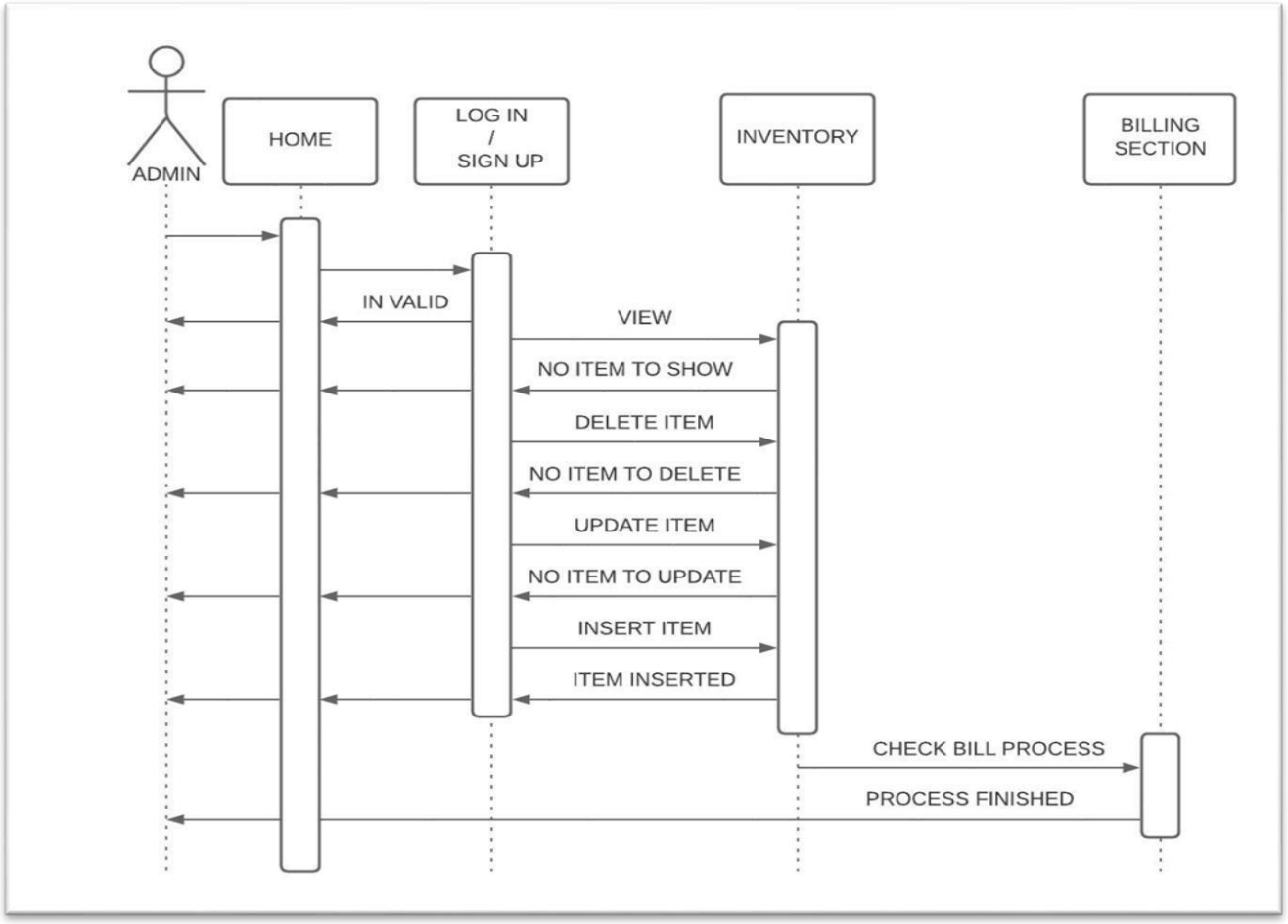
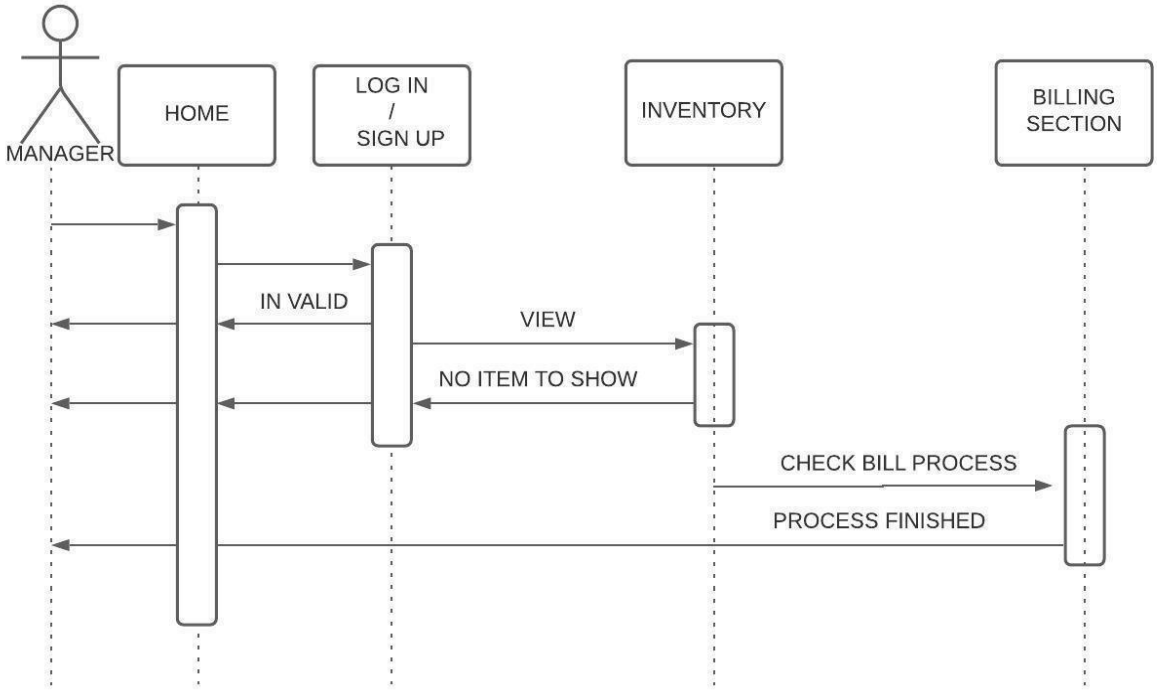
Appendix B – Analysis Models:

Sequence Diagram: A sequence diagram is given as well to let reader comprehensively understand the whole procedure of the system in sequential manner:

Admin View:



Manager View*:*



Customer View: