Design and Implementation of a Web Application for an E-Plant Store

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ABSTRACT

With the advancement of technology in every industry, finding items with a few clicks is now simpler. Most people do not have enough knowledge about planting and its advantages of it. Therefore, this platform will be very helpful for those who sell and buy plants. Customers cannot compare prices or pay online when it comes to markets or plant nurseries. So, in this case, Plantae.lk offers various opportunities to customers. They can inspect, get details, compare plants' pricing, and make online payments easily. In this competitive business world, customer satisfaction is extremely important. We want each customer to have a pleasant shopping experience. With that intention, customer support service offers technical advice and guidance when it is needed. This web application also consists of detailed gardening advice. The major goal of this web application is to provide a better business experience for both seller and consumer.([1])([2])

Keywords— Web Application, E-Planet, Wholesale

I. INTRODUCTION

An e-plant selling platform is a place where the details of plants are organized, categorized, and showcased to the customers to buy as they want. it includes the ability to do retail purchasing which sells to the public, and wholesale purchases which sell bulk to businesses such as other plantations and commercial gardeners. Some plantations produce bulk stock, using seeding or grafting of varieties for purposes such as fruit trees for orchards, or timber trees for forestry, for those requirements it's better to have a single place to buy or sell seeds, and plants with proper guidance and customer support. On some occasions customers may need to get their hands on specific rare plants or flora they will have to first find a source and then prepare for travel, make reservations, go through a detailed tutorial about the plants, and many other steps before buying the plant from a plantation. In this paper, we introduce an all-in-one e-plant selling platform to satisfy every requirement with one click. Every plant or flora is thoroughly explained and attached with guidance on how to maintain and it is implemented with smooth navigation from the showcase to the end of the order delivery. Furthermore, the e-plant selling platform lets customers choose various payment methods such as credit/debit cards, cash on delivery, or even a money transfer. Present-day housewives are so eager to make their gardens filled with various kinds of plants and flora as much as they are busy with all the work and chores. For busy housewives or gardeners, it is an ideal platform to learn, explore and buy plants.

II. RELATED WORK

The following are some related websites that inspired us to choose this topic. Most of these websites are international and have very little or no support for the Asian region. Even if there are Sri Lankan sites like www.ceylonagri.lk they are not very popular among gardening enthusiasts. That is why this project can be very useful for users in Sri Lanka.

A. The Sill

The sill is an online market platform for plants. Started in 2012 in New York. It does not only sell rare and genetically modified plants the site has a wide variety of plants grouped into different categories. It also provides tutorials and lessons on how to take care of specific plants. Also, the users can enroll in their online courses to learn and get certifications on planting. The site is very responsive and user-friendly. It inspires people who visit their site to start planting which is very beneficial to the environment and helps people to find new hobbies and passions. More information can be found at www.thesill.com([5])

B. Plantly

Plantly is also a website that allows users to be educated about the environment as well as to choose and buy plants according to the user's requirements. Plantly also does community services like reforesting projects. It allows voluntary users to organize and advertise their projects with people with similar interests in plants and the environment. Also, they do surveys and provide data for people to get a better understating of plants that have a risk of extinction,

and they do projects to save them. They also provide a platform for users with similar interests in plants to share their opinions and experiences. Additional information about this site can be found on www.plantly.io([6])

C. Ceylonagri

Ceylonagri is an online platform for gardening enthusiasts in Sri Lanka. not only plants they also sell organic and non-organic fertilizers as well. Also, they provide YouTube tutorials on how to take care of plants. They have provided blogs on different topics to educate users. And they have a separate section to sell organic food as well. They provide island-wide delivery for plants and organic food as well. They also provide a platform for volunteer users to organize plant distribution campaigns and reforesting projects. Additional information about this site can be found on www.ceylonagri.lk([7])

III. METHODOLOGY

This research was to design an e-commerce business in ornamental plants and determine what benefits would be made for ornamental plant farmers if they used e-commerce to sell their agricultural products. The method used for this research is descriptive. Mainly based on JavaScript. By using the MERN stack, where the backend will be implemented on Node.js and the frontend will be implemented in React.js. MongoDB will be used for the database. All the business data is analyzed quantitatively to predict the growth of e-commerce-based plant businesses.

User authentication and sessions will be used to validate the details and demo payment gateways will be used. Relevant data will be recorded in the database and that data will be used in report generation. Flow charts for different scenarios are given below.

A user should log into the system if he/ she doesn't have an account they should first register to the system to continue what they want to do within our system. Once logged into the page the user directs to the necessary showcase page (There are separate pages for Admin & User). The user can select the item they wish to buy and add them to the cart. Then you can click the cart icon and see the items that have been added.

After finalizing the cart then you'll redirect to the delivery details adding page. Next the payment details. In the final process, the user will send a notification saying that the order has been placed. Figure 1 shows how the process is done.([3])
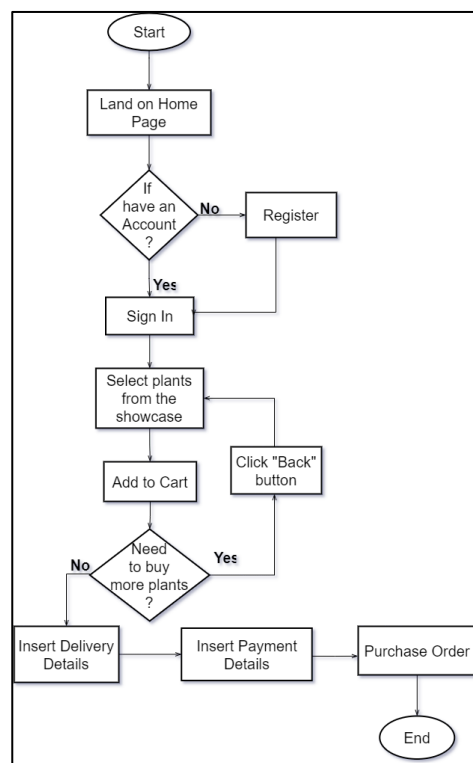

Figure 1: Flow chart for Ordering Process

User should enter their credentials to sign into the system. By the entered credentials the system will decide whether the user is a customer or an Admin. After logging in to the system the customer redirects to the showcase page where all the products are shown. Then the user can click the image that is in the top right corner button next to the shopping cart. Then clicking the 'View Profile button user can update their necessary details. And the customer can also generate a report for all the products he/ she has ordered from our site.

As for the admin side after logging in to the system the redirects to the showcase page. Then by clicking the user button and can see all the admin user details and all the user details of the customers. Then by clicking the update profile button can change your detail. And, if a user is meant to be an Admin, then the admin can change the user to an Admin. This 'Update user as Admin' option can only be done by the admin. If a particular customer has suspicious activities or does something inappropriate regardless of our system beneath the rules and regulations the admin can also abandon/ delete the user from our system. Figure 2 shows how the insert and delete process is done.
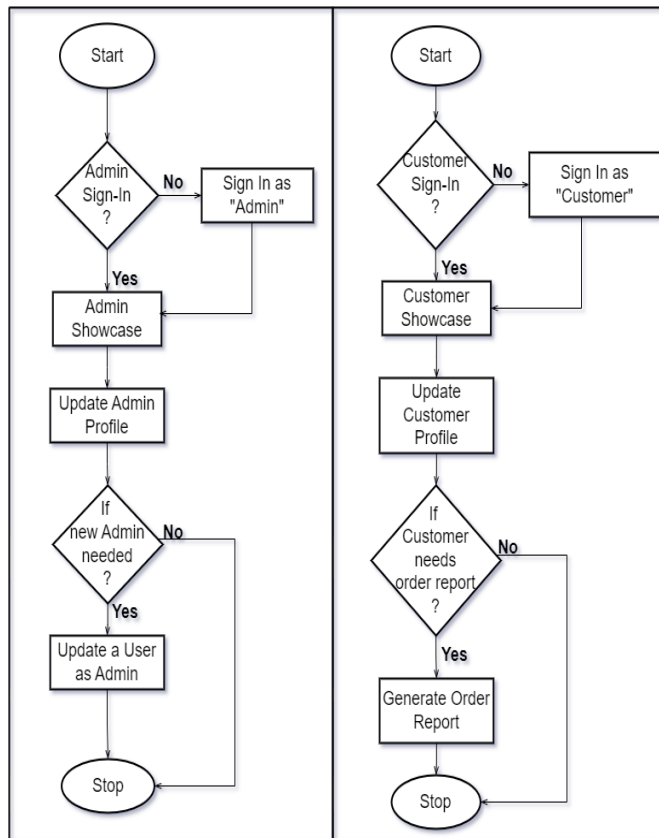
Figure 2: Upload/ Delete Process

As said in figure 2 we should be logged into the system this time as an Admin. But the admin can't register as an Admin first. It's assigned by the admin staff whether he/ she is admin staff or not. Then if there is a system change in the products, first we should identify if that products were new products or not. If the added products are new products the admin should add them to the showcase by adding the Product Name, Quantity Arrived, Description, and Unit Price.

If the system change has happened to the products being sold or not the admin should generate the report to check why the system changed or what the sold products are. Then all the changed data and added new data should be displayed from the admin's perspective. Figure 3 will show how the process is done.
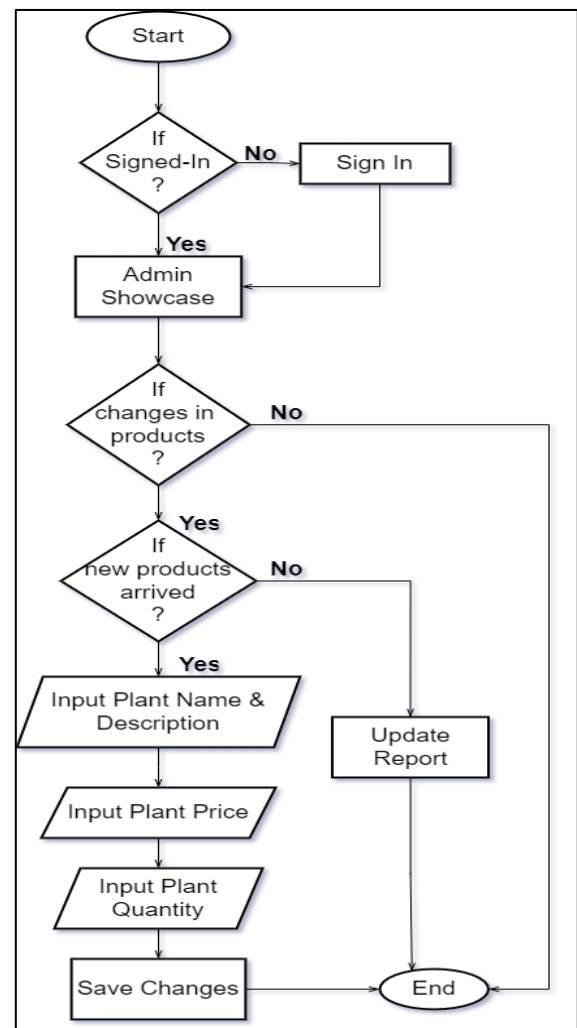
Figure 3: Add/ update New Products

Figure 4 is relevant to the admin generating the monthly/ Daily reports. Most of the generating report parts belong to the admin side because the admin should always know all the details and the admin is the only person who can do the changes. If any detail is changed by someone else, by generating these reports the admin can identify who can when that change happened.
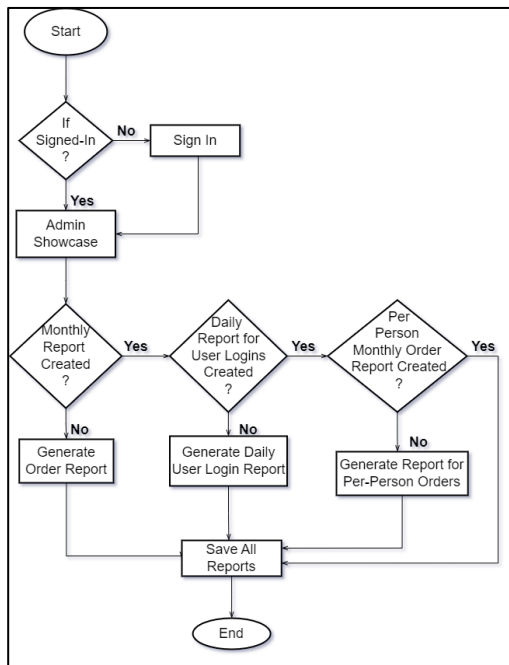
Figure 4: Report generation Process

IV. PROPOSED SYSTEM

A. User Authentication and Validation

When a user land on the website for the first time they have been given an option to either log in or register to create a new account. Users of this application can be categorized into three main types Clients, staff, and admins. Even though there are three main types they all use the same login page to access their desired accounts. The user type is automatically differentiated by the credentials and redirected to the relevant page. Figure 5 & 6 shows the login and registration pages respectively.
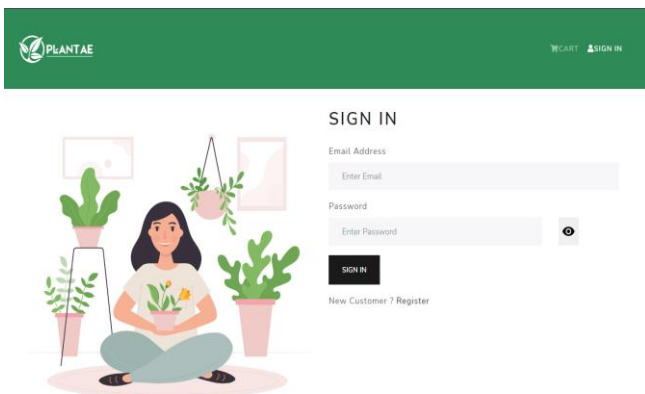
Figure 5: Login Interface
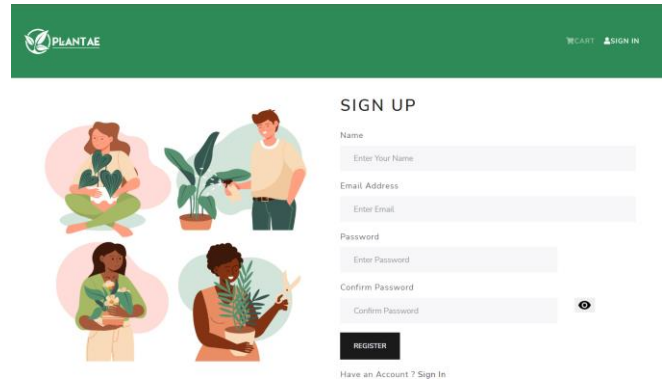
Figure 6: Registration Page

B. Plant Showcase

When the users sign into the website, they will be redirected to the relevant showcase page according to the user type. The functionality of the showcase page will vary depending on the user type. As an example, clients can only purchase plants and add reviews, but staff users can add new plants and edit the details of existing plants. Admin users have the access to delete plants. Other relevant products such as fertilizers, gardening equipment, seeds, and vases will be displayed on the showcase page. Figure 7 shows the wireframe of the showcase page.
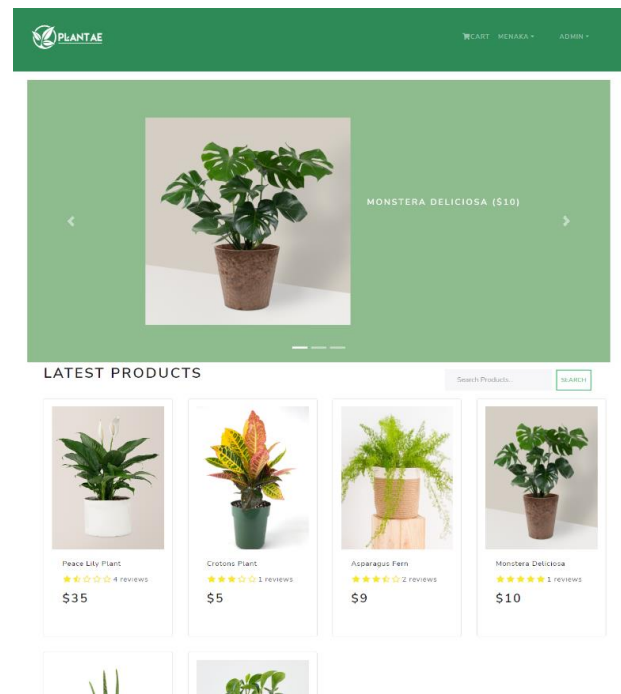

Figure 7: Plants showcase Page

C. Create/Update/ Delete products from the system

As shown in figure 7, all the products are added by the admin to the system and shown on both the admin and

client sides. Delete and Update products are also done by the admin. Update and delete functions are shown in figure 8. Update and delete functions are done by clicking the edit and bin icon in figure 8. Product creation is shown in figure 9.

Figure 8: Product Edit/ Delete page

Figure 9: Add Product Page

Figure 10 shows the deleted product popup. The popup gets the confirmation from the admin to delete the product.
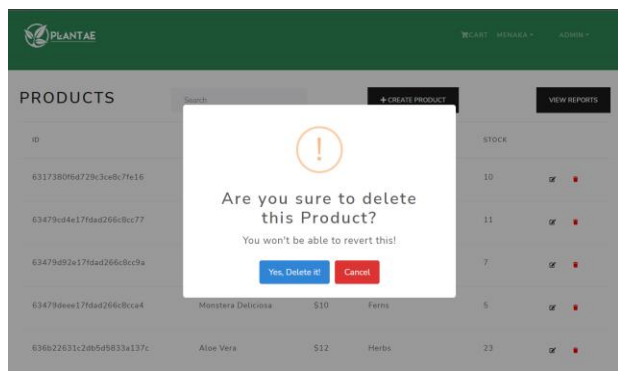

Figure 10: Delete button popup

D. *Ordering an Item*

When the client selects an item, they will be directed to the details page of the relevant item. On that page, clients can add that product to the shopping cart linked to the client's account. After adding the items, they can purchase the items on the cart by providing the relevant delivery details and payment details. The wireframe of the ordering function is shown in figure 11.
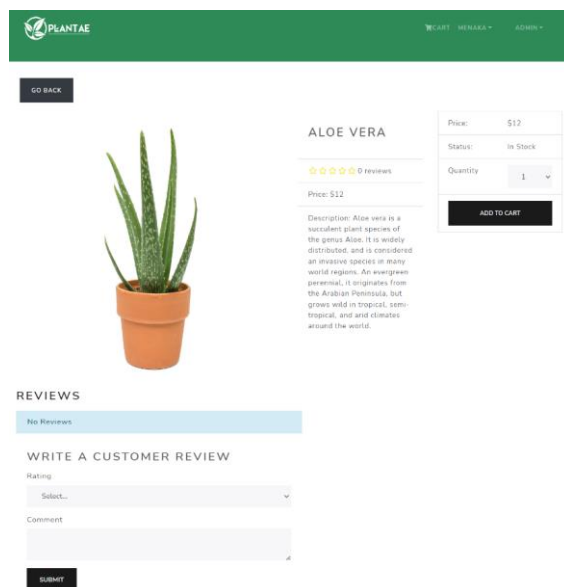

Figure 11: Preview before adding to Cart Interface

E. *Managing Profile*

Clients and admins can change their name, email, and password as well as see the order history. Figure 12 shows the interface.
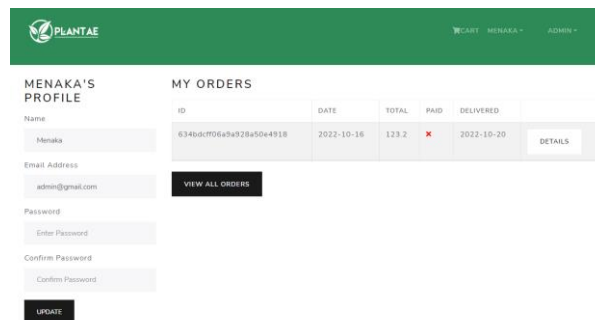

Figure 12: View Profile Interface

F. *User Management*

Admin users can see the list of the users of the site, and they have the access to delete the users if needed. Figure 13 shows the interface.

Figure 13: User Update Page Admin Side Interface

G. Report Generation

Staff members can generate reports to see the login information of clients. Also, staff members can generate reports to analyze the purchase details of products. Figure 14 will show how the interface is shown. Admin users have the access to generate reports to see the logging information of the staff members as well as the clients.

Figure 14: Report Generation Interface

V.   DISCUSSION

This section is focused on the expected results and the key functionalities of the functions discussed in the methodology.

A. User Authentication and Validation

To test this functionality developers should at least write three test cases to test the main 3 types of users. Additionally, more test cases can be written to test the accuracy of the user authentication function. Figure 15 shows how the authentication process will happen when different users logged into the system.
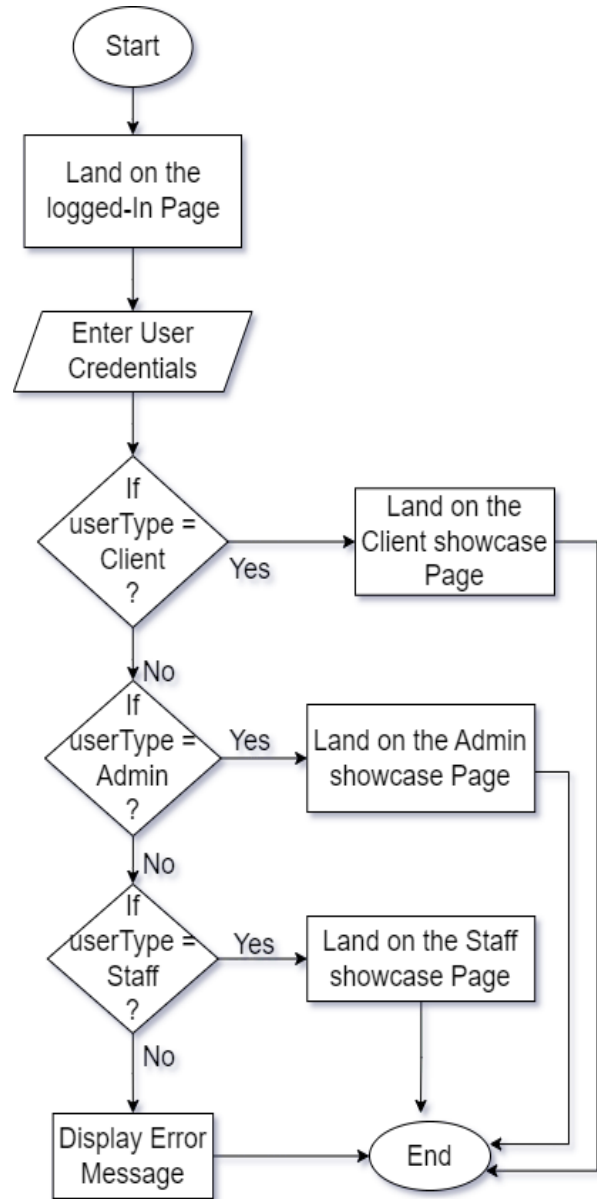

Figure 15: Authentication Process

B. Ordering an Item

Developers should write test cases to check the reliability of this function by testing different valid and invalid payment details and delivery details. Also, the users must be logged in to a client account to order an item. The system should validate the login information as well as the payment and delivery details. Figure 16 shows the valid logical sequence of ordering an item.
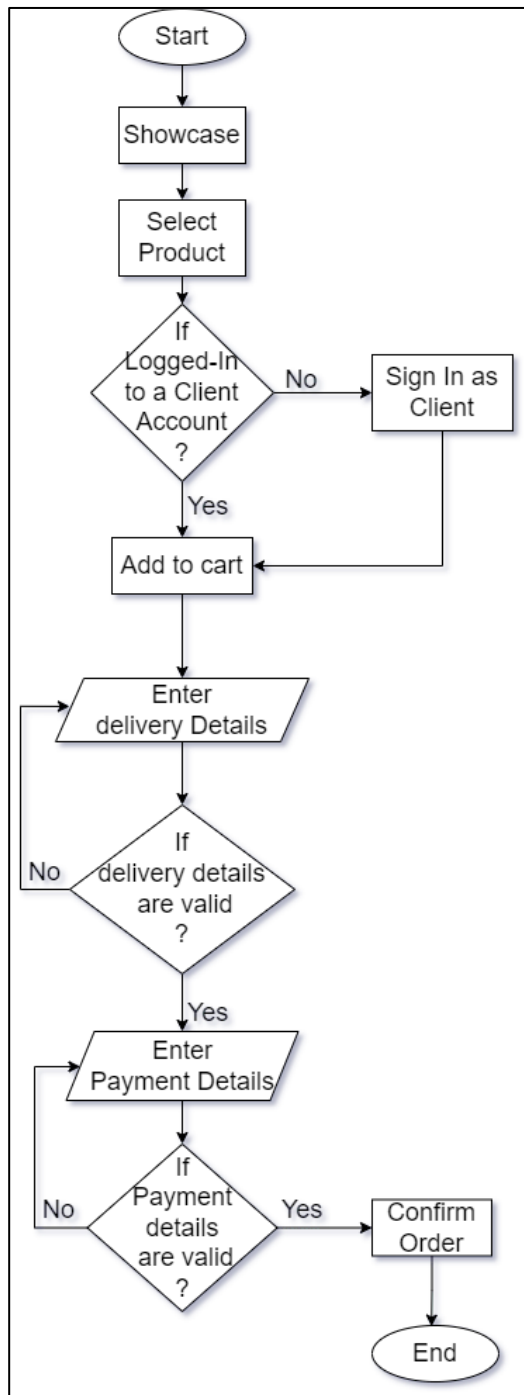
Figure 16: Order an Item process

Figure 17: User management Flow

C. User Management

This function should be critically limited to admin users. Test cases should be written to check that this function is only accessible by admin accounts. Figure 17 wills how the process of user management
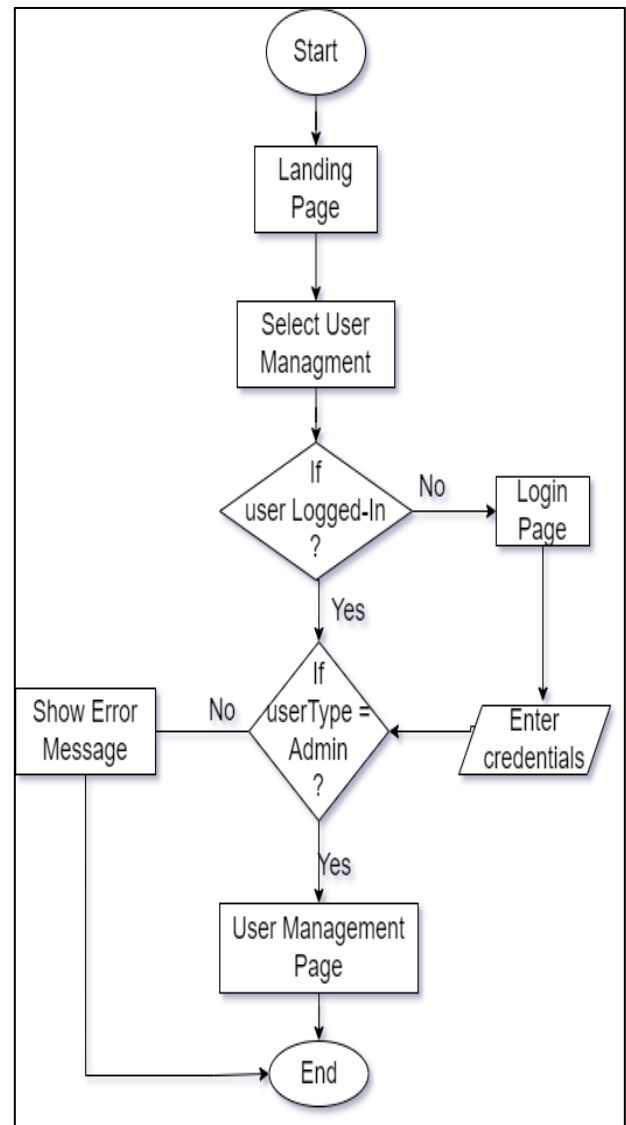
D. Report Generation

Developers should write test cases to check the accuracy of the reports and to check the validation of the accessibility of the report generation functions.
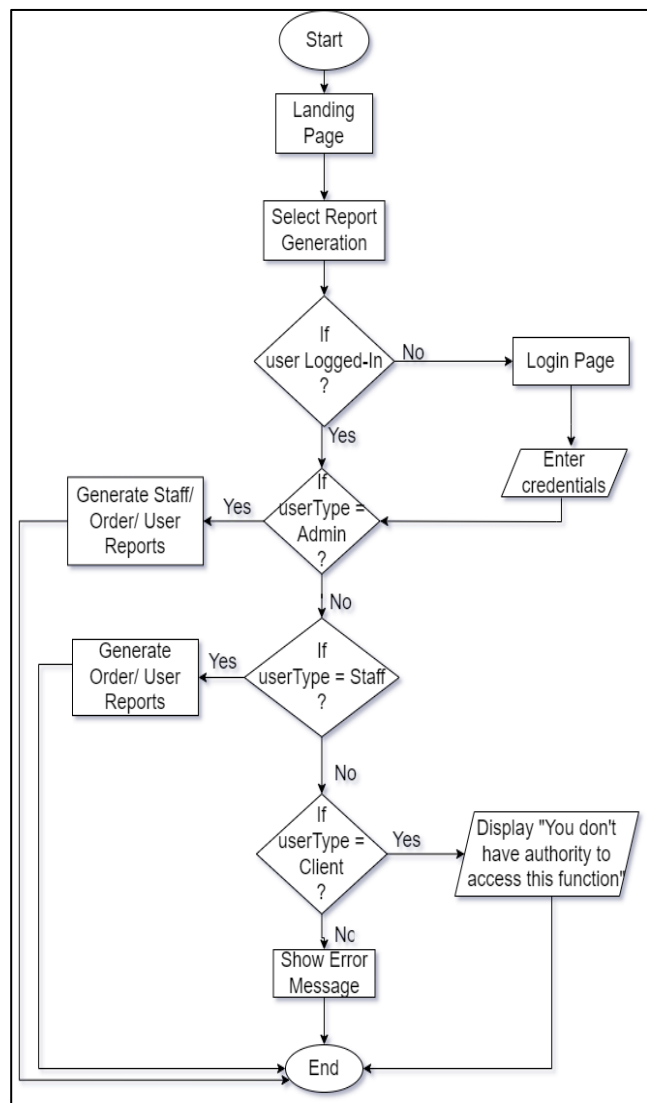
Figure 18: Report Generation Process

VI. CONCLUSION

The proposed system can guarantee the quality of services that it is going to provide in the future. This system allows customers to browse plants without even being registered customers. Online payment makes it easy to do transactions and customers can track their order and delivery details throughout the process. Users can give feedback and suggestions based on their satisfaction level. According to the above key points, this system makes it easier to communicate and do business transactions between the seller and buyer.

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