Centralized Platform for Managing Activities in E-Commerce Store

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ABSTRACT

This project is a web based online shop management system for existing store. This online shop management system mainly consider about managing and automating the tasks in the online store. One of the main problems raised on existing systems were that there is no control with the admin user to manage items on the store. In this system there are users as Customer (Buyer), Admin and Seller. This proposed system allows these three users to manage their activities in a central platform. This research paper mainly discusses about main functionalities available in this system, how these functionalities are performed by each user and the way that these functionalities are implemented and tested. In-depth discussion of the tools and technology chosen to develop this system, as well as the reason behind those choices, is also included in this research paper.

Keywords-- Web Application, Online Shopping, E-Commerce

I. INTRODUCTION

When considering the store management system, these item inventory duties were previously completed manually with documents, incurring significant expenditures for the records as well as time and space for their upkeep. The system's primary flaw is the event.

The present system for managing inventories was created using a web application, which is a type of computer technology. No storage space is needed because cloud databases are used to store the gathered data. These systems' user interfaces have been created in a very user-friendly manner. This web application was developed using the react and mearn programming languages, and the mongodb cloud was utilized as the database.

For convenience of development and use, we have separated up a few functions here. The management of users, items, shops, payments, and feedback are among them. The system is made to be accessed in three different ways: as a trader, a customer, and an administrator.

As a result, this is also highly beneficial in minimizing many issues that come up while keeping a useful recorded inventory system. As previously said, a web application like this can be used to methodically fix many of these issues.

II. LITERATURE REVIEW

E-commerce based systems/sites incorporates with the wide range of business opportunities and commercial activities. It encompasses activities from selling household grocery items, monetary services like stock investment to booking plane tickets and online banking [2]. Because of this heavy usage, there are different types of existing systems, solutions and researches available in this domain. The proposed system in this research paper provides a centralized platform for managing activities in e-commerce store by providing advanced solution other than existing systems.

There is existing research published by Thao Huynh about design an development of an e-commerce web based application [3]. Main issue in this system was that there are only two users available. Those are administration user and customers. So, there is no intermediate user to manage the activities between these users. Because of this issue there will be high coupling in the activities associated with administration user. In our proposed system there is a user as a buyer. This user will have permission to add items to the store but that items needed to be approved by the administration user.

According to a research paper Application of User Research in E-commerce App Design by Cong Mu [5], checking user satisfaction based on analytics is important in web-based applications. Existing systems do not mainly consider about this aspect in the system. A system proposed by S.N. Mahmudah et al, provides some detailed statistics of visitors' statistics about the system. But it does not consider about the user's feedbacks about the system. Getting users' feedback is a vital bit of information when upgrading the system to a new version. Our proposed

centralized system for web-based e-commerce application provides a feedback management section to grab users' feedbacks about the system. This feedback management functionality generates some reports with useful statistics and reports about the customers feedbacks about the system.

Comprehensive research by Tairan Liu discuss about E-commerce based application model On cloud computing [6]. In this research, author mainly consider about how the information is stored in the e-commerce based system and the way of integrating cloud computing into these type of application. But in this study author do not discuss about what type of data will be stored in e-commerce based application.

Our analysis about existing e-commerce based application helped to find out most important functionalities missed by these systems. Our proposed application provides solution to most of these identified issues and create a centralized application to manage all of these tasks in a web-based e-commerce system.

III.   METHODOLOGY

By researching the e-commerce system and collecting data about it. The e-commerce systems' major issues have been recognized. Failure to comprehend the system's user base and their demands is one of the key issues. Additionally, the extremely complicated user interfaces and the abundance of authentications are an issue. It is essential that the system be well-secured, but we must also realize that not all user levels require the same level of protection as the administrator. We thus employed a relatively straightforward way to solve these important issues.
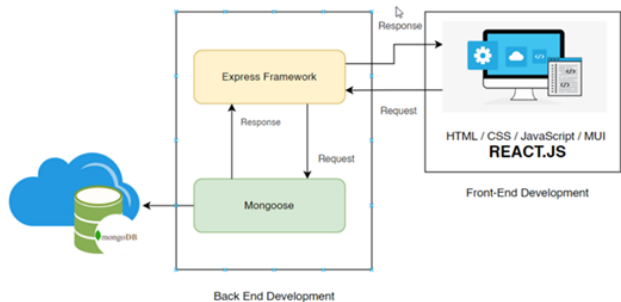

Figure 1: System Diagram

That is understanding the proposed system's user base and classifying the user's process. After compiling all of this information, conducting researc h, and analyzing the data, we determine that the cloud com puting methodology is the best course of action. We select ed the MERN technology stack to support that idea since i t works with both cloud and RESTFUL APIs.

Both frontend and backend of this application was

developed using JavaScript language. Express JS is used for the backend and React JS is used for frontend development. Express is a backend web application framework which can be used to develop RESTful APIs using Node.js. Express allows developers to build applications very quickly because it is very easy to configure and customize. This was a major concern when selecting Express as the backend technology for this application.
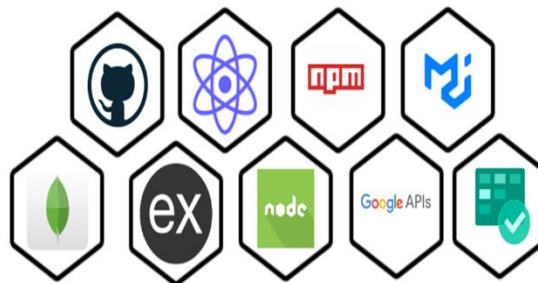

Figure 2: Technology Stack

Selecting database is a very important architectural decision when developing software. For this online shop management application, MongoDB was selected as the database. MongoDB is a cross-platform document-oriented database software. It is also considered as a NoSQL database. One of the main reason for selecting MongoDB from other available databases because it is a full cloud based developer data platform. All of the items, users details, feedbacks and other data in the system is stored in MongoDB database as documents.

ReactJS is used as the frontend technology for this Online Shop Management Application. ReactJS allows developers to build interactive reusable UIs. Threre are different JavaScript frameworks and libraries available for frontend development. One of the major concern when selecting ReactJS was its flexibility and the performance.

IV.   PROPOSED SYSTEM

A. User Management

All users must first register with the system. Users must navigate to the registration screen in order to do it. Then complete the necessary fields. (If the user is a customer) The "Register button" can be clicked by the user to register as a "Customer." Then, using the user-added email, it will send an email of confirmation. (If trader is the user), The "Request for trader" check box must be selected if the user wants to register as a trader. The form will then extend, requiring the user to complete the necessary data. The user can then "Request" to

become a trader. Finally, the trader will get a confirmation email at the address provided. He or she can then sign up as a trader.
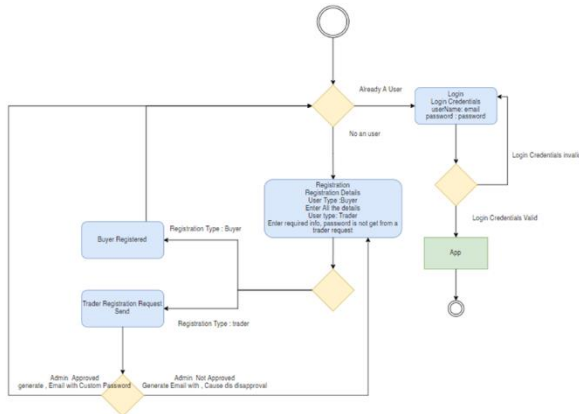

Figure 3: Login / Registration Logic of the system

There are three applications for this application, as specified in the project description. (Administrator, Trader, or Customer) Administrator will receive static login information. Therefore, the major focus of this screen will be on clients and traders. Customers may use the application as soon as they sign up using this form, per the project scenario, however traders can only request to sign up because trader creation will be handled by the admin side. The admin must verify the user's information and validate the user's status as a trader, which takes some time. Utilizing email confirmations, registration will be validated.

Users then access the login page, enter their credentials, and click the "login" button. This user interface is focused on the application's user authentication section. It is made to be user-friendly. It will authenticate the user with just two data fields. It makes advantage of Google's recapture technology to stop bot assaults.

The component that the admin offered allows the admin to log in using the provided credentials. Next, go to user management. Only the admin may see this UI. Using this table, you may see all of the users. Using this UI, an administrator may manage any user process. Create, update, and remove users. The administrator may utilize the table to look up any user by name, email, or phone number. An administrator can determine the various user kinds by looking at the "user type" and "user states" columns for the users (trader, customer). By looking at the states column, you may confirm these traders and examine trader requests.

The user approval procedure is then limited to traders. Admin will update the user information appropriately. Start by going to the login page. Afterward, log in as an admin. Go to user management next. then select the appropriate update button from the user list

screen. You'll then reach the user-update screen. The administrator can then change the user information appropriately. Then choose "Update". This user interface is focused on the application's user updates. The administrator can update the users by utilizing this form. (Customer, Trader, Admin) Although the Administrator is able to amend the user's information, some information, such as the user ID and email address, cannot be changed. The form is checked for compliance with the criteria. The administration can accept trader requests and deactivate users by using this update option.

B. Item Management

The number of stores is growing in our nation nowadays. Instead of being done manually as in the past, this inventory job is being done using a web development system and new technologies. Additionally, this store system's inventory activities and other operations were previously carried out using written records. The inventory system has been fundamentally done nowadays through a web application due to a number of considerations, including retaining these papers as well as maintaining them daily due to a shortage of space facilities.

Here, the Administrator, Manager, and Cashier are in charge of this. With the use of this, time restrictions can be set for item creation, item update, item deletion, and even report generation.

a. Admin functionalities in item management.

Regarding the administrative side of item administration, he must complete activities like item creation, update, and deletion as well as obtain report generation and maintain the system correctly. The item is loaded into the system as a category in this case, and the table view is used to present the item's most important data. Only the admin has the ability to edit and remove an item's details here. The quick access to the item's details is made possible by the development of the search and sorting functions.

Figure 4: Item management flow

b. Report generation function on item management (Admin side)

Figure 5: Item report generation flow

Getting the report of the things manually in this case was a highly taxing issue in the past. To do that, studying the papers and producing the report takes a lot of time. Our web application makes it very simple to generate reports, and you can also get them in PDF or CSV format. This report creation component has advanced to the point where it can be printed. These days, this technique is highly helpful for keeping documents organized while taking up less space.

C. Shop Management

Shop Management System (SMS) is a software application to be developed to manage most of the activities or tasks running in an Online Shop Management Application. This system has divided to three main modules that are Product Approve Management, Shop Items and Cart Management, Lastly Report Generation Management. The system module covered in this document is the Shop management modules as per mentioned above.

Product Approve Management is designed to handle Items, which provided by suppliers while Item Management provide all the details of each item. The item included details such as Item name, Description, Quantity and the Price. The Design of Item Management functionality will trace the Items stocks that need to be refilled and according to the requirement suppliers will provide the items. Afterwards from the Product approve management functionality will validate and approve the items that needs to be exist in the shop. Approving functionality will provide the high functioning quality and some enhancement will apply in this functionality by the interface design and the components design.

For the Shop Items and Cart Management, SMS will provide the buyers to view all the products under categorization. Under high functioning quality. Categorization buyers can easily select or view the items via Interface design. Buyer can view the items by filtering or

searching options. The buyer who login using credential have temporary cart will remain for maximum 2 times login to the system or else buyer can use wish list for keep items permanently. The buyer can chose the products need to be checkout; those products will added to cart. Buyer can increase or decrease the amount of each product that wish to buy. According to the quantity the cart amount will be calculated. This functionality will provide the high functioning quality and some enhancement will apply in this functionality by the interface design and the components design.

The main feature in this system is focused on Report Generation Management. From the Administration view admin can select the date period that need to collect products information's that has been approved. After validating the date period system will display the approved products. Products will display if only available to the selected date period otherwise it will show the no date interface UI. After products displayed Download option will appear, this is a high functioning quality for the enhancement of the interface design.

Below, diagram will demonstrate the full function that explained above in the summarized manner.
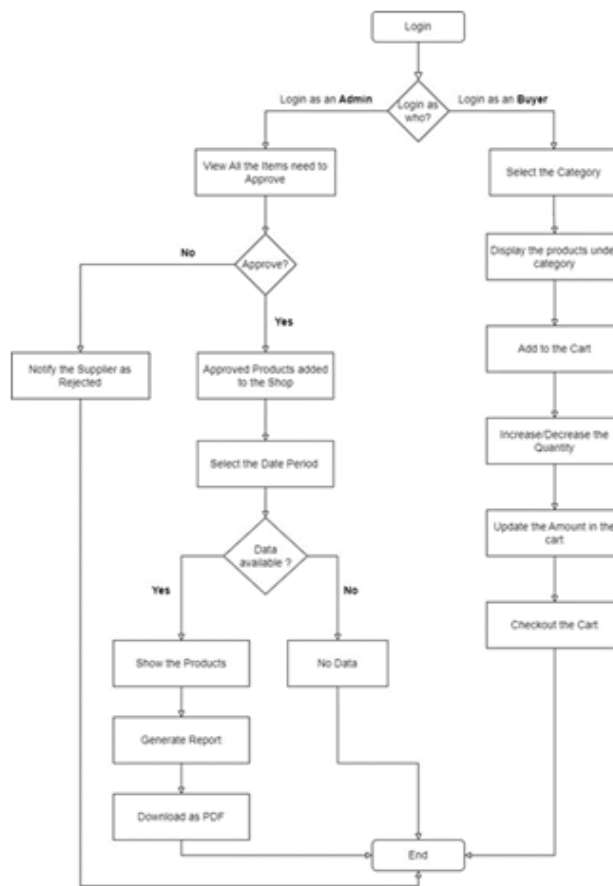
Figure 6: shop management flow

D. Feedback Management

With increasing competitive market in today's business environment, it is important to avoid disappointing the customers. So, it is important to gather customer feedbacks about the business. Also, it is vital input to the new product development process [1]. Feedbacks from different customer allows businesses to meet customer expectations and improve business value among customers. According to Janelle Barlow and Claus Moller a complaint can be considered as a gift. There can be negative or positive feedbacks from customers. But this different feedback allows organization to minimize their weaknesses.

In this proposed online shop management system feedback management associated with admin user and customer. Main responsibility of customer is to give feedbacks about the system by adding feedbacks through the system. Main purpose of this functionality is to check the usability of the application. These quality attributes help to improve non-functional aspects of the system.

a. Customer functionalities in feedback management

Customer is the main user associated with this use case. Customer can submit feedback through available forms. This functionality allows customers to give positive or negative experience faced during the using the application. Customers can update feedbacks sent by him/her. Also, this proposed system allows customers to delete feedbacks added by him/her. So, this makes more flexible for the users. After submitting form details, this customer feedback data will be added to the database. Then system can process these customer feedbacks and generate valuable information.

Figure 7: user flow customer feedback

b. Admin user functionalities in feedback management

Main purpose of admin is to manage feedbacks sent by different users. Admin user can view all the feedbacks sent by users. In this type of application, it is important to have some knowledge about customer experience. There for this system allows admin users to get detailed report about customer feedbacks about the system. Admin user can select time range to generate a detailed report about customer feedbacks. This allows admin users to analyze information submitted through feedback forms and get strategic decisions to improve experience of the application. After generating report user can download the report as PDF. This download functionality is enabled because some organizations accept paper documents as official reports.

Figure 8: Admin user flow in feedback management

V. DISCUSSION

Some of the small stores or boutique shops are using different systems to run different business activities. There are some problems that cause management, not to be efficiently handled. Computer technology emerges as a new force to substitute traditional management methods. Shop Management System (SMS) is a software application to be developed to manage most of the activities or tasks running in an Online Shop Management Application. This system has divided into six main modules that are user management, Item management, Product approve management, Store management, Payment management, and Feedback management. This web-based application was developed using the MERN stack, which used MongoDB to store data. Used Node JS + Express as the framework for the Backend development and React JS for Frontend Development. This Project was version controlled within

the team using GitHub. Azure Board is used for tracking our team milestones within each sprint to finish work successfully within the timeline.

A. Key Findings

Shop Management systems (SMS) that are existing for the small stores or boutique shops do not have central platform to view customer feedbacks about the system. For this common issue from our shop house system we managed to give solution as users can add feedbacks about the system and system allows admin users to generate reports about customer feedbacks. Another common issue is all the traders can add any item to the store without any control for that we have come up with a solution that trader add item to the store, it needs to be approved in order to displayed in the store. In the existing shop management systems There are no report generation functionalities for users like traders. For that we proposed system allows traders to generate reports on items on the store and payments made from the customers. Existing system have very complex user management processes when registering and authenticating users lastly for that issue we have provided simple and secure user management and authentication process using email.

B. Testing the system

After developing a software system, it should deliver the functionalities expected by its users. Software testing is the method that used to verify and validate a software. In the initial phase it should verify that the system meets the users' requirements. In this system, developed system is compared against initial documentations like users flows and UI wireframes. After checking initial user requirements, system functionalities needed to be tested.

In order to test system functionalities, system is divided into two parts as frontend and backend. To ease the test case design, system also divided into the five main scenarios that exists in the system. Those are user management, payment management, item management shop management and feedback management. For each of these scenarios frontend and backend functionalities tested separately. Backend testing is done using the JEST JavaScript test framework. JEST allows developers to write test scripts in JavaScript and execute them as a test suite. By this all the backend APIs can be tested and allows to verify backend processes working as expected. Frontend testing of the application was conducted using Selenium. In this Online Shop Management Application Selenium is used because it provides functionality to run test across modern web browsers without needing of test scripts. This minimized the effort needed for writing test scripts and save the time in testing phase of software development. When testing frontend functionalities in selenium, first user need to first record the test case and then the user can run this recorded test cases.

VI. CONCLUSION

All of the data collection, planning, and execution came to an end. It is evident that the suggested system is an upgraded and better version but is not the greatest answer for the major issues. We draw this conclusion because there is room for improvement with new technology aimed at the next generation. As per the overview, the proposed system includes crucial components for managing users, shops, items, and comments. These aspects offer advantages for a system that can be improved. As a research team, we also expect that the suggested system and these solutions can improve the current e-commerce system.

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