Major Ecommerce Focus on Product Management Future

R.M.C. De Silva
Sr. Lecturer, Department of Computer Science, South Eastern University, Sri Lanka

Corresponding Author: rmcseelan7543@gmail.com

ABSTRACT
In recent years, people's acceptance of online shopping has increased markedly with the gradual maturing of e-commerce. This paper aims to propose an ecommerce platform for furniture stores that suits small and medium businesses to expand choice and convenience, allowing customers to buy from a wide array of products with the click of a button. Although there are many existing ecommerce systems in the market, our proposed system stands out for its user experience. This proposed system focuses mainly on four main functions: product management, order management, order-review management, and user management. The current research has been undertaken to walk you through the literature view, methodology, functional overview of the proposed ecommerce system, and discussion. The study further examines the key variables imperative for the success of the proposed system. The findings of this study afford practical implications for the improvement of the online shopping experience of consumers for furniture companies.

Keywords: ecommerce web application, online store, order online, payment gateway, shopping cart.

I. INTRODUCTION

The Furniture manufacturers in Sri Lanka are investing in having their presence in the online world to strengthen brand awareness and increase their customer interaction. Besides, the smaller enterprises might struggle harder than bigger enterprises due to lack of resources. For this purpose, this proposed online furniture store is developed to facilitate small and medium furniture stores to sell their products online as well as to help customers who do not have time to travel to shop, buy furniture online.

Although there are many ecommerce web applications available for furniture stores in the market, most of these businesses make the mistake of forgetting about usability. A usable ecommerce site should take less time to think when used, and less complex. Therefore, user-friendliness is one of the most important factors we have considered when designing the proposed system. The system helps customers quickly find the target products and complete the shopping process quickly and clearly. Based on this, it strengthens the application of the concept of user experience, meet user needs, increase user volume, and create a good brand effect.

The proposed web application is designed and developed based on client server architecture using ReactJS for frontend and NodeJS and ExpressJS for backend. The database management system is a document-oriented MongoDB, which allows to maintain flexibility and scalability during development.

The workflow of the system illustrates signing-up and logging into the system, browsing through the available furniture, add the desired products to the shopping cart, placing the order, making payment, marking the order as delivered, and then providing a review for the order. Apart from that, system data can also be exported to pdf.

During the development phase, we managed the team members' work using Azure Boards which provides a set of Agile tools to plan and track work.

We use GitHub, a code hosting platform for version control to store, track, and collaborate on the proposed project.

The proposed system is tested using an automated testing tool called "Selenium" which provides a playback tool for authoring functional tests across most modern web browsers.

SonarQube which is an open-source platform is also used to continuously inspect the code quality to perform automatic reviews with static analysis of code to detect bugs, code smells, and security vulnerabilities of the proposed system.

The findings of this study together with the use of effective tools and technologies, afford practical implications for the development of an online furniture store with user-friendly interfaces, functionality, and interactive parts.

II.   RELATED WORK/LITERATURE REVIEW

There has been a considerable amount of research on eCommerce in developing countries, and these studies have highlighted the influence of contextual impediments relating to economic, technological, legal, and financial infrastructure on the adoption of eCommerce in those countries [3].

According to the existing research conducted recently, it was observed that they are mainly concerned about the consumer and the seller and their business perspectives. As a consumer started to browse the furniture products available in the ecommerce platform, they start to look for the product images, prices, reviews, available payment methods and delivery methods. In the instance consumers are much familiar with ecommerce applications nowadays. Since Ecommerce platform has come to at matured level. Users can make payments through PayPal, cards, and cash on delivery also.

Previous research illustrates the business functionalities, this research paper focuses additionally on the security, authentication, and authorization mechanism that must be exercised in a distributed system. Internet security has become a consistent and growing problem as various Internet-based technologies and applications are developed and distributed. There is an increasing number of incidents related to security violations because of the unusual intentions of users [4].

This proposed application can be used in web browsers, mobile devices, tablet devices, and various kinds of user roles, and from different locations, the data and information should be transferred very securely. It should be made available anytime to the users. It should not be altered illegally in the middle. User sessions are kept to a certain time limit. Inactive users automatically get logged out. Passwords are stored in an encrypted manner. User roles are provided with relevant access rights to do CRUD admin functions. Each user is uniquely identified in the system. In this proposed system security functions have been given priority other than the usual business functions compared to existing research papers works.

III.   METHODOLOGY

Technologies

We have developed this system by using Mern Stack, as the figure 2 clearly describes how the MERN stack structure is working. There the frontend is reactJS and the backend was implemented using Nodejs and expressJs, here mongo DB was used to connect the database. Through that, the opportunity to develop our implemented system was provided.

React JS

React is a JavaScript library for creating user interfaces that is declarative, efficient, and flexible.[1] It allows you to build complex user interfaces out of small, isolated pieces of code known as "components." React.js is built with JSX, a JavaScript/XML hybrid. The elements are built with JSX, and they are rendered on your website with JavaScript. Although react requires a great deal of understanding for a new developer, it is quickly becoming one of the most popular and sought-after JavaScript frameworks. Although react is classified as a JavaScript library, the other solutions examined today are considered frameworks. Consider a framework to be a complete design, and a library to be a tool that developers can use in any project.

MongoDB

MongoDB is a cross-platform document-oriented database program that is open source. MongoDB, a NoSQL database program, employs JSON-like documents with optional schemas. MongoDB was created by MongoDB Inc. [2] and is licensed under the Server-Side Public License, which several distributions consider to be non-free. MongoDB records are made up of documents with a data structure made up of field and value pairs. Documents are the most basic type of data in MongoDB. The papers use the Binary JSON format, which is a variant of JavaScript Object Notation (BSON). The use of BSON has the advantage of supporting more data types. The fields in these documents are structured similarly to the columns in relational databases. Values can be in a variety of data formats, including other documents, arrays, and arrays of documents.

Tools

In this project we have used Azure boards, GitHub, SonarQube and Selenium as tools and done more precise project management. Azure Board provides interactive and customizable tools for software development and project management. It provides a set of capabilities such as native support for agile and scrum processes, integrated reports, and configurable dashboard for the project.
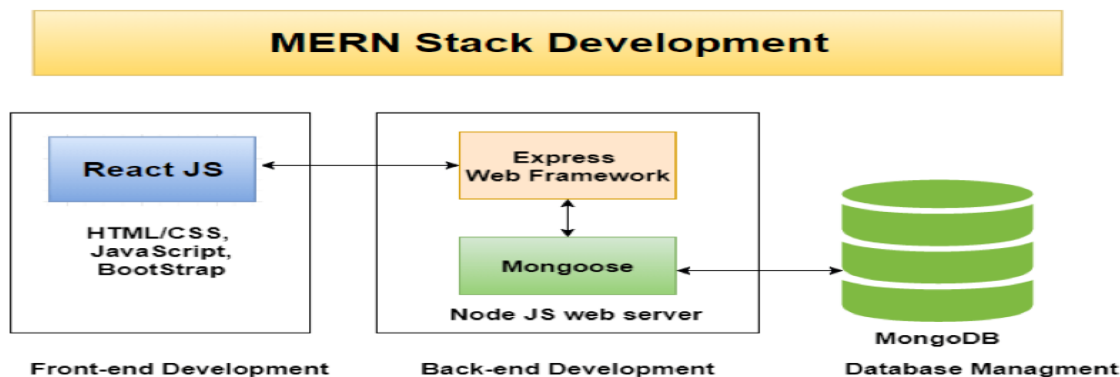
Figure 1: MERN Stack Development

SonarQube

SonarQube is a tool for code quality assurance that gathers and examines source code and generates reports on the project's overall code quality. It combines static and dynamic analytic methods and makes it possible to track quality over time continuously. The figure 2 shows the overview status of analyzed project. There, bugs, vulnerabilities, code smells, duplications related to the project are shown separately. It can measure the quality gate, reliability, and security of the overall project. From this overview we can get details about the project, project activity, quality gate and coverage in detail.

Selenium

Selenium is a free and open-source tool for automating web browsers. It provides a unified interface for writing test scripts in a variety of programming languages, including Java, NodeJS, PHP, Perl, Python, and C#. We ran Selenium tests on our system, and all of the test cases passed. Selenium runs and displays our test in different web browsers, under different operating systems. Here, our test is deployed and shown under various environmental conditions under Selenium grid.

IV.   PROPOSED SYSTEM

Our system was based on the e-commerce platform. According to that, we developed an online furniture system. This system contains many functions. We divided those functions into four main components. Those are product management, user management, order management and review management.
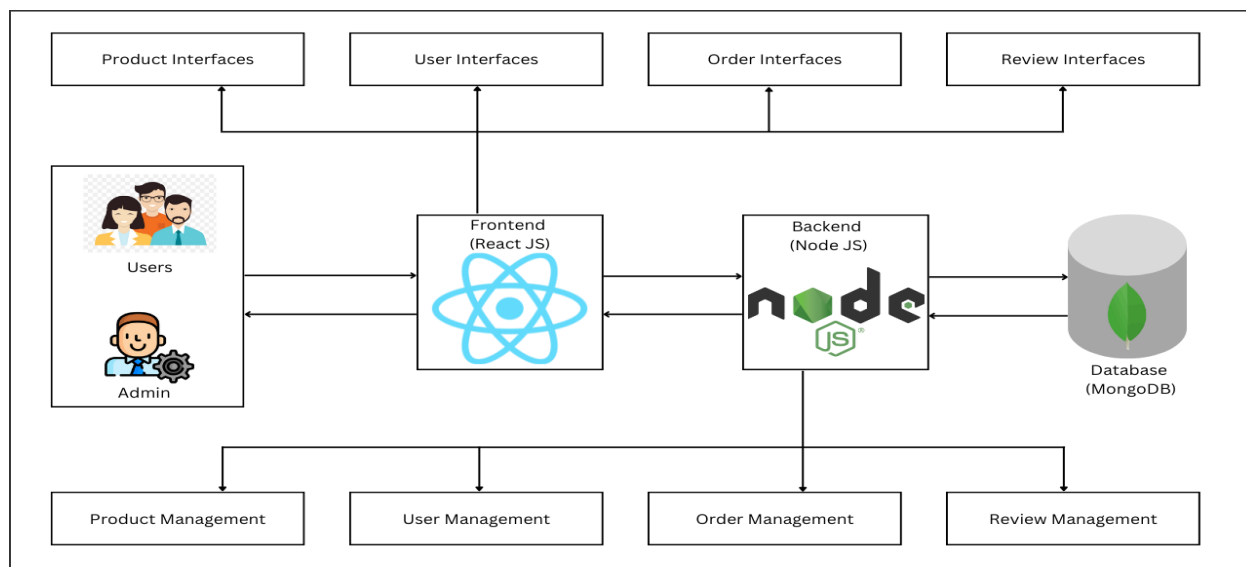

Figure 2: System Overview

4.1 Product Management

This function was based on the admin process. Admin can add the product to the system, edit the product details and delete the product. Finally, generate the product details report based on available products. Customers can search for products using product names.

4.2 User Management

To Access our system, users should have an account (register). The users who have an account can log in to our system giving user credentials. Customers can edit profile data. On the admin side, he can edit user details, delete the user and search the user by username.

4.3 Order Management

Users can select furniture according to their wishes. Selected items were added to the cart. The user can place the order. Admin can view order details, delete the order, search order details by order id and generate order details report.

4.4 Review Management

Users can give a review for a particular product. On the product details page, users can see the available reviews that others are submitted. To write a review user must log in to the system after login he can see the review form and can submit his review. The review form. Admin can delete review and search review by product id.

V.   DISCUSSION

The overall workflow of the application is described below referring to the figures mentioned above. When a user starts to interact with the application, the user needs to create an account, the user can create an account by providing his name, email address, password. User validations are given to check the relevant fields are entered; email address should not be existed to avoid the duplication of the user account. Password should be minimum 8 characters and should contain at least one upper-case, lower-case letter, one number and one special character. The password should be entered twice to confirm the password. Both entered password should be same. If any mismatches occur, the system will display relevant user-friendly error messages. So that the user can rectify the errors and provide correct information. The validations are front end validations. If he has an account already or successfully created an account, he should provide the login details to gain access to the pages through login page. A user can browse furniture products in the home page or else he can search for products using keywords. After viewing the products if he wishes he can select and move them to cart page. There he can add more products, change quantities, check prices. Then he can move to payment or checkout page. After rechecking the details, he can check out the order by selecting delivery method and payment details. Payments can be done PayPal or credit card. In addition to that the user can review the products. He can rate the product quality through quantitative number of stars which ranges one to five and can add a comment. He can view the existing the review comments, and average star rating. A user can manage his profile. He can change his password.

In the admin management panel, admin can manage products, users, orders. An admin can add a new product by entering product name, price, image, brand name, stock count, category, and a description as in figure 4. Further he can view the list of the products in a tabular format. He can edit or delete product details. He can search from the product list. He can generate a report of the product lists.

An admin can manage the orders, he can delete the orders, search for orders, generate a report of orders. Admin can manage the users, he can update the user details, delete users, grant admin privileges, change back to user from admin, search for users.

Selenium automated test tool used to test the behavior of our web application to check it works as per expected. Selenium records the workflow of an application from the browser and provide real time results. In the following figures illustrates the functional testing of main components and the results. The result of the testing is success. It is indicated in the figures.

We have selected Selenium for the following reasons, they are it supports several languages including Java, C#, PHP and python. Supports for cross-browser testing, provides an efficient way of comparing expected and actual results, and it is an inbuilt reporting mechanism.

We have successfully concluded the functional tests. The results are following below. Code quality is maintained up to optimum level. Code is separated into several components.
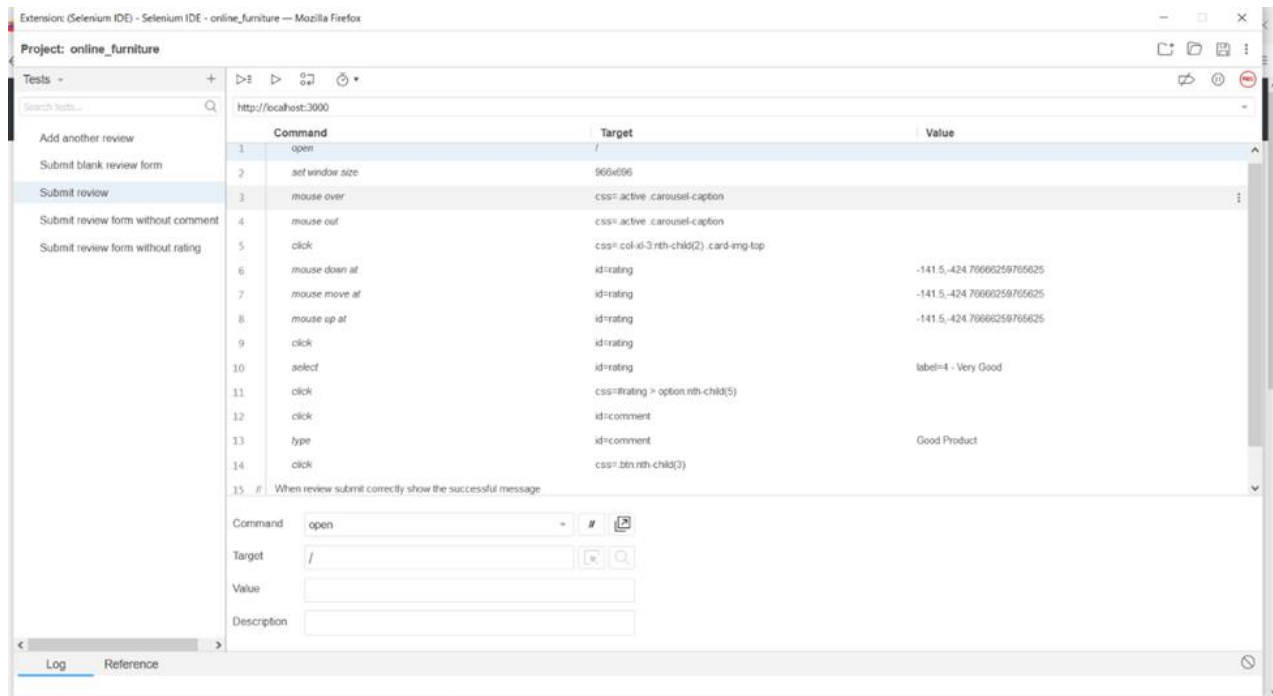
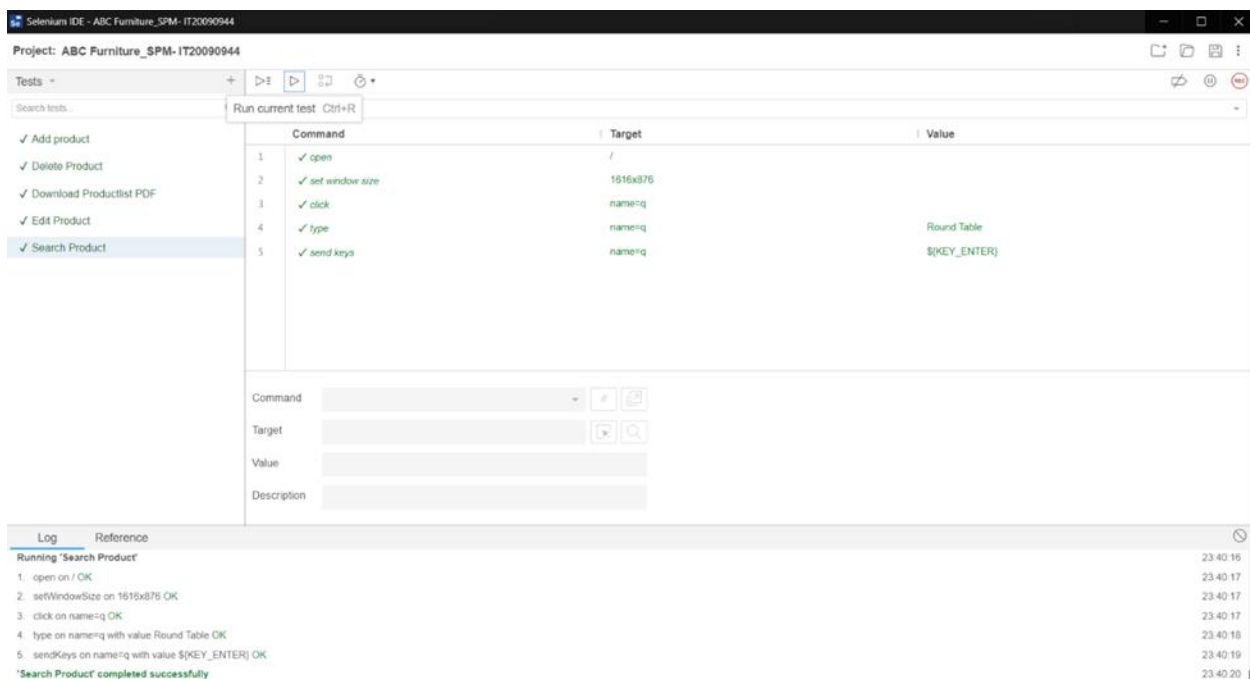**Figure 3:** Test cases – submit review

Figure 4: Test result – search product

VI. CONCLUSION

The findings of our research show that smaller enterprises might struggle harder than bigger enterprises due to lack of resources. The lack of resources can negatively affect a company's communication and marketing channels such as their environmentally friendly work. Besides, judging from the current trend, with the popularity of the internet in the country and

the growing popularity of e-commerce, people are accustomed to online consumption. This research paper provides insight into the development of a proposed ecommerce web application for furniture stores. By revealing a practical approach on how to achieve usability and with the correct use of tools and technologies, by revealing a practical approach on how to achieve usability and with the correct use of tools and technologies, the proposed system fulfills all the requirements of a furniture store as well as the customers.

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