

Implementing E-Commerce for the Future

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ABSTRACT

This research paper describes an E-commerce web application. In the proposed system there are four stakeholders and assigned related functions to them. The system is based on four stakeholders as user management administrator, store administrator, delivery administrator and customer. This system has been introduced based on buying and selling as grants. It is possible to carry out the usual process without any blockage through this system. Here, the user management administrator performs tasks related to user management, the store administrator performs the functions required to handle the online store, the delivery administrator performs the processes related to the delivery service, and the customer performs the tasks related to the purchase of items.

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

I. INTRODUCTION

An e-commerce application is a popular platform for purchasing goods and services today. Nowadays, many people are used to doing online business. But in the past, there was something completely different. There was no such application. The reason for that was that the technology had not developed. Therefore, people had to go to a market to get goods and services. But today, this field has greatly improved in getting the relevant goods and services from home.

The proposed system is about an e-commerce platform called "Go Go Gadgets Store" in this research paper. Here, four grant stakeholders can be identified in that platform. That is, user management administrator, store administrator, delivery administrator and customers.

The user management administrator can view registered users and manage them. Also, the user

management administrator can generate a report related to registered users. Registering and logging into the system as a new user is done through the user administrator.

The store manager can add, update, and delete items under different categories. It is also possible to generate a report related to the items.

The delivery administrator should manage all activities related to delivery. Under that, already completed, pending, and ongoing deliveries are controlled. And also, can generate a report regarding the delivery details.

Here the customer has to first register or login into the system. Then the customer can manage the relevant account. And the customer can select favorite items and add to cart items. Generally, the process between the seller and the customer can be done more easily and in less time through this e-commerce application. Completing the needs through this new e-commerce application by avoiding the drawbacks of the existing system is excellent progress.

As mentioned above, the proposed application through the e-commerce system provides the opportunity to find and select the required items without delay. Through this system, its main goal is to show it as a more successful application by reducing the drawbacks in the general market.

In this research paper, under the related work/Literature Review, a very simple comparison is made by pointing out a related published report. Through the methodology topic, a description is made of the tools and technologies related to the proposed system. Under the proposed system topic, the functions related to the system will be analyzed using UI, and through discussion, The system focuses again on certain key points of this system. A summary is performed again through the conclusion.

II. RELATED WORK/ LITERATURE REVIEW

Let us now consider the research papers related to the e-commerce application which is going to be proposed and how it is related to our work. [1] [2]

Through above article highlights some important issues, such as information related to the e-commerce field, how to do buying & selling through e-commerce, and how to work in the e-commerce field while maintaining competition, and comments have been expressed. From the proposed system perspective, it should consider here how those matters are related to our application. [3] [4] [5]

By reading the above articles, you can compare many functions related to our system and get a rough idea of how it relates to our work.

The store administrator has to add products to the system related to our application. Here, under the B2C concept, when adding the product, identifying the customer's preference and systematically attractively showing the details is a technique used in e-commerce. By referring to these articles, the answers to the question of how to prepare the necessary background to carry out the relevant tasks efficiently and how it is related to our work can be known. Additionally, these articles demonstrate how popular e-commerce platforms are today. [6] [7] [8]

III. METHODOLOGY

This proposed system is developed by using MERN Stack. The front end is ReactJS, and the back end was implemented using NodeJS and Express JS. Here MongoDB was used as a database. Those technologies influenced the proposed solution's well development and management.

Azure boards, GitHub, SonarQube and Selenium, are also used as tools when developing this application, and those are very helpful for more precise project management. Azure Board provides an interactive and customizable tool for software development and project management. It provides a set of capabilities such as native support for agile and scrum processes, integrated reports, and a configurable dashboard for the project.

Agile methodology under the Scrum framework was followed when developing this application, and there were two sprints in the development stage. There, the epics, tasks, and sub-tasks were categorized into two sprints and followed accordingly.

The project is planned to complete within two months, and since using the proper project management tools, this project has been completed within the planned time duration.

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 continuously makes it possible to track quality over time.

Figure 1 shows the overview status of the analyzed project. There, bugs, vulnerabilities, code smells, and duplications related to the project are shown separately.

It can measure the quality gate, reliability, and security of the overall project.

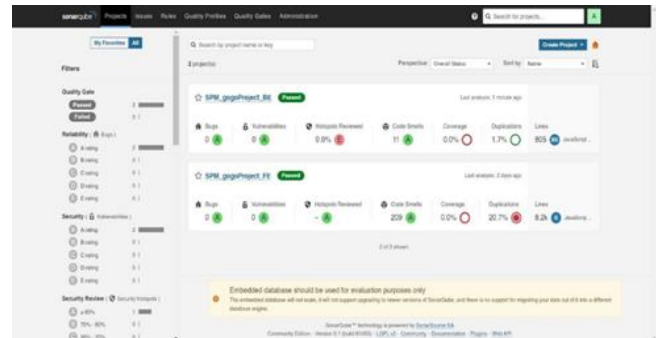


Figure 1: SonarQube Overview status of analyzed projects

Figure 2 shows the project overview. Here you can take care of the project, project activity, quality gate and coverage in detail.

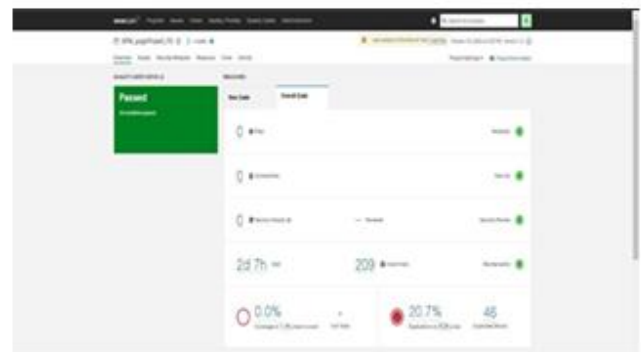


Figure 2: SonarQube Project Overview

Figure 3 shows how the SonarQube tool has checked the code quality of our project and shown the errors as project issues.

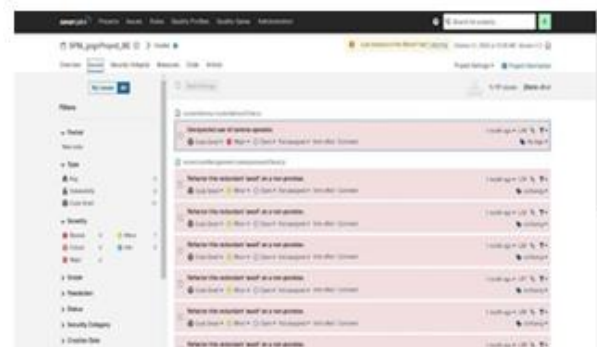


Figure 3: SonarQube Project Issues

Selenium performs our test in different web browsers under different operating systems. Figure 4, figure 5 and figure 6 are some examples of test cases deployed under this application and the logs of the test

cases. These are shown under various environmental conditions under the Selenium grid.

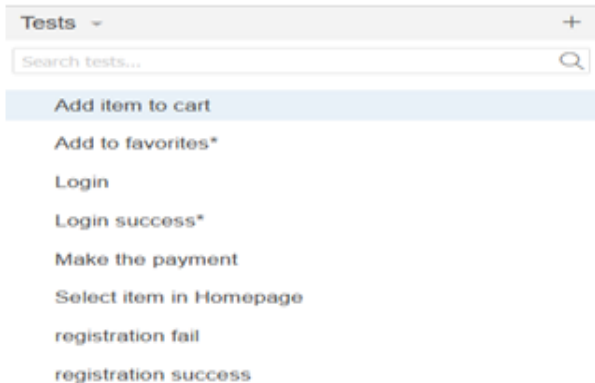


Figure 4: Selenium test case

| | | |
|----|--|-----------------------------|
| 6 | click | css:style_s_button_7D0x |
| 7 | click | css:color-ch4S() card_image |
| 8 | type | css:item_quantity |
| 9 | click | css:item_quantity |
| 10 | type | css:item_quantity |
| 11 | click | css:item_quantity |
| 12 | double click | css:item_quantity |
| 13 | type | css:item_quantity |
| 14 | click | css:item_quantity |
| 15 | click | css:color-apple |
| 16 | assert:alert | Item added to the cart!! |
| 17 | Checking whether the item is added successfully to the cart when clicking the add to cart button | |

Figure 5: Selenium test case

Figure 6 shows selenium IDE after running the test case. There it shows adding an item to the store. If the test cases are not run, and an error is shown, the process will not be completed successfully.



Figure 6: Selenium test case

Figure 7 shows the automation according to a test script. It shows how to automate the test according to the command and the target URL.

Figure 7: Selenium test script

GitHub can monitor the progress of our project. It can be used for bug tracking and version control.

As mentioned above, it demonstrates that technology and tools were used in our proposed system.

Combining all the tools and technologies finally made it possible to successfully develop the desired system.

IV. PROPOSED SYSTEM

As mentioned above, this proposed system is an e-commerce system. It is based on user management administrator, store administrator, delivery administrator and customer. It is shown in detail in Figure 8 mentioned below. If the process is explained again, user management is done through the user management administrator.

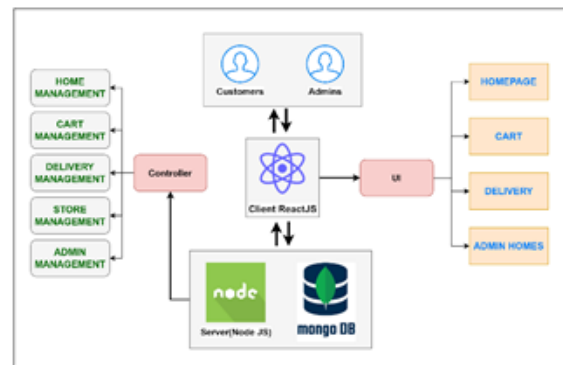


Figure 8: System Overview Diagram

The store administrator handles the store. The delivery administrator does delivery-related activities, and the customer views the store, selects their favorite items and adds them to the cart.

These functions are through this system. This section describes the functions through the main UI related to the developed system.

After logging in, as in Figure 9, the admin will be redirected to the dashboard showing registered users. Figure 10 describes the create account page. Here Users can register the system by giving valid input values. Admin can check the details of any respective user there, as shown in Figure 11.

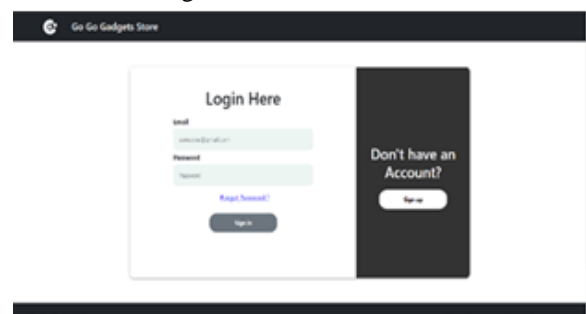


Figure 9: Login Page

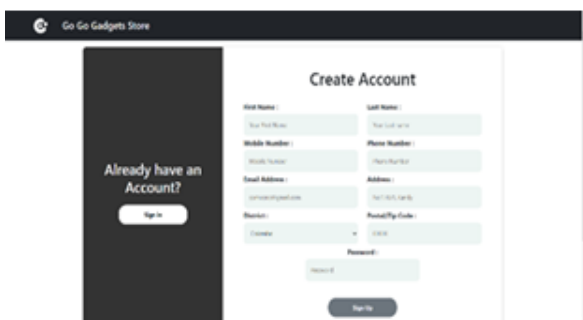


Figure 10: User Registration



Figure 13: Store Warehouse

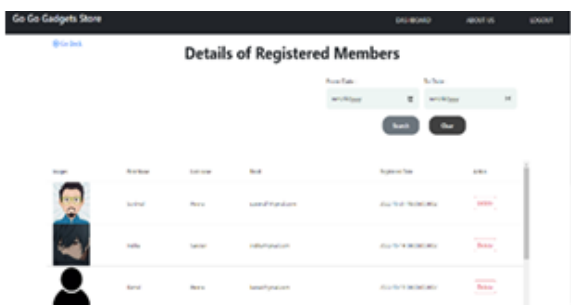


Figure 11: Details of Registered Members

After clicking the 'Print' button, the user management admin can generate a report of the registered users' details and see the number of registered users as shown in Figure 12.



Figure 12: User Management Admin Report

Under Figure 13 shown below, the store administrator can manage all the items in the store. Admin can view all the items here. From the edit button relevant to the item, the admin can direct to the edit details page, and from the delete the button admin can delete items. To navigate the next pages in the table, there is paginate.

And the store administrator can add items to the system. Figure 14 describes the adding a new item page in the system. To add an item, the admin can enter the details into the input fields and press the 'Save' button.



Figure 14: Insert New Items

The customer can view the full details of an item and do it if he/she buys it or adds it to the cart. Customers can select the quantity from the spinner add select 'Buy now' or 'Add to cart' according to their needs. Scrolling down will display the specifications and reviews of the item.

Delivery admin can also log in using credentials. Then admin will be redirected to the delivery admin dashboard page. Admin will be redirected to the relevant service page by clicking the button in the dashboard.

Delivery admin browses Pending deliveries and clicks on the 'Arrange Delivery' button on a specific pending delivery entry. Then on this page, the delivery admin may enter the relevant delivery details according to the given fields. After entering details, the admin can create a delivery order by clicking on the 'Create Delivery' button, as shown in Figure 15. The admin can ignore the currently entered details and return to the Delivery Homepage by clicking on the 'Cancel' button. Admin can also monitor the ongoing deliveries by accessing the interface illustrated on Figure 16. Once a specific delivery is marked as completed it will be moved out to the completed deliveries page Figure 17



Figure 15: Create Delivery

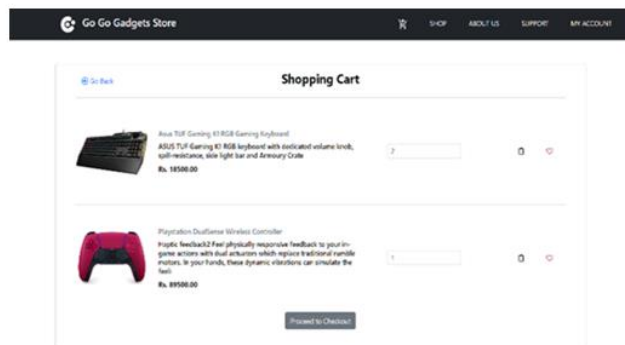


Figure18: Shopping Cart

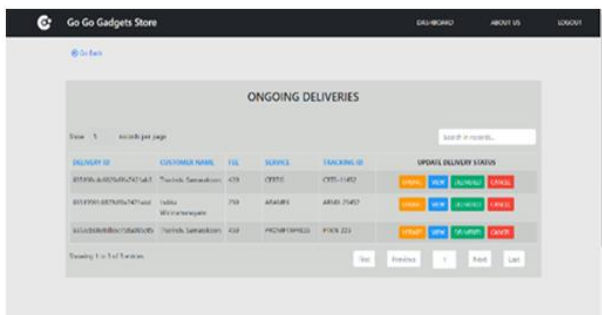


Figure 16: Ongoing Delivery

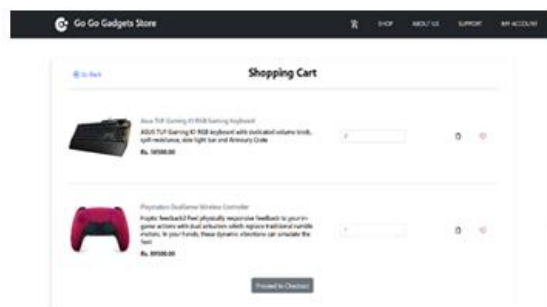


Figure19: User Home

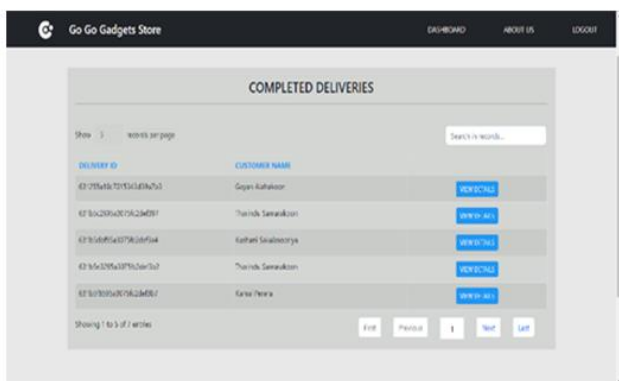


Figure 17: Completed Delivery



Figure 20: Payment Section

The customer can add the selected items to the cart. Then the relevant items in the shopping cart are shown with the quantity. This process is shown in the Figure 18. The interface illustrated in Figure 18 is related to the shopping cart. Users can browse products by going through the Homepage illustrated in Figure 19 and by clicking on an item users can view more details on that item. After the user selects the add to cart button, those items are added to the cart interface with the item quantity. If the user needs to change the quantity of the previously added item to the cart before proceeding with the payment user can change the quantity. If a user needs to remove items from the cart, the user can use the delete button, or if the user needs to add the items to the favorite list, then the user can use the heart icon to add those. After finalizing the items in the cart, the user can select proceed the payment using Proceed to Payment button, as shown in Figure 20.

The user can view the purchase history as shown in Figure 21. Users can remove items from the order history using the 'Remove' button. Or the user can add a review for the completed order item using the 'Add Review' button. The user can view the monthly report as illustrated in Figure 22 using the 'Purchased Report' button.

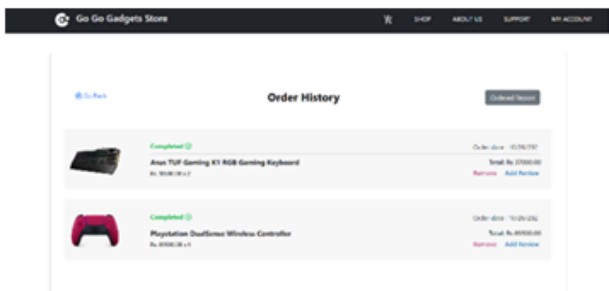


Figure 21: Order History

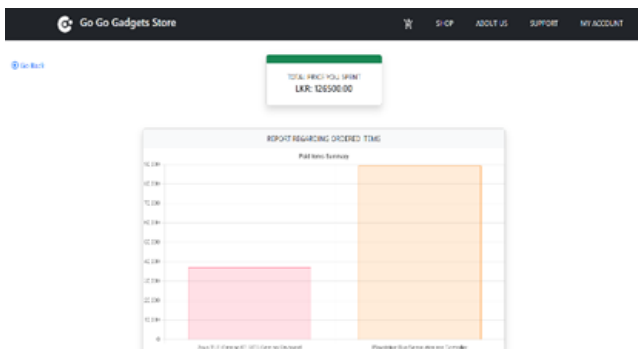


Figure 22: Order History Report

V. DISCUSSION

The aid of the aforementioned technologies and techniques was very helpful for the success of the proposed system. The tools and technology utilized for a project have an impact on its success.

The proposed all-in-one e-commerce solution has discussed the tools and technologies used for the system and explained the proposed system using UI. The system has been successful because of the tools the system used as testing tools and the technologies used to develop the system.

Development methodologies become faster and easier with suitable version-controlling (VCS) technologies such as GitHub. When developing these standalone systems, proper VCS also helps to reduce development costs and time. Here, our e-commerce application, based on user management administrator, store administrator, delivery administrator and customer, helped make the described functions successful.

Several significant benefits can be highlighted when discussing converting a manual B2C system into a fully automated one. Because consumers have issues when purchasing offline, it is vital to develop an e-commerce web application for searching and shopping at each store. In the modern world, there are many e-commerce websites like Amazon, eBay, and AliExpress are some of the famous solutions available under online solutions, and it has been reflected that customers can easily buy the products they need by using these websites. Using these types of websites, one can buy their products from the comfort of their home. Finally, through the system can see the difference between the prices of the products. The

product cost in online shopping will be slightly higher than offline shopping. The proposed solution always tried to address some of the essential capabilities that most existing online solutions are currently missing. The "Go Go Gadget Store" is developed, targeting small and medium-scale gadget store owners to easily convert their existing offline businesses to stage onto the online platform and boost their sales.

The proposed system mainly focuses on consumer electronic items around a single category. The reason behind this is that rather than focusing on multiple areas. It will always be better to develop a total solution around a specific field. The proposed application comes with several basic and essential functions like item management, user management, admin access control, payment/delivery management, and Cart/Wishlist solutions that help with a web store's ideal operations.

Online payment methods can reduce the hassles associated with using physical money, such as counting notes and dealing with balance money. Another significant benefit of online shopping is quickly filtering items by searching and sorting them using keywords. Rather than manually entering transactions, client information, and delivery information on books, automated solutions are advantageous in the speedy administration of data and are more effective in creating forecasts.

VI. CONCLUSION

The proposed system brought under this research paper an e-commerce application. This application will help to make buying and selling more efficient in everyday life. Here in the system-built functions related to that application under the stakeholders of user management administrator, store administrator, delivery administrator and customer. There, the customer must log in after registering in the system. Then the customer can view the item, select the favorite item, and add it to the cart. Also, the customer can generate the purchase report and add reviews. The delivery administrator has to access the delivery dashboard and act according to the relevant delivery status. New, pending, completed, and ongoing deliveries will be processed there. The store administrator can add items, view items and generate reports through an admin dashboard.

The store administrator can manage the items added there at any moment. Here, the user management administrator deals with things related to user management. Here you can generate a registered user details report. The research paper related to this e-commerce application was based only on the four stakeholders mentioned above. Those four stakeholders were enough to complete the application's expected tasks. Further research and functions can be added to this system if necessary. This application can be further developed by adding some related functions under a required stakeholder.

The main goal in developing the suggested solution is to boost sales by contacting millions of people worldwide and eliminating barriers caused by distance in a local business.

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