Apparels: E-Commerce Clothing store

Submitted in partial fulfillment of the requirements
for the degree of

B.E. Information Technology

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CERTIFICATE

This is to certify that the project entitled **"Apparels: E-Commerce Clothing store"** is a bonafide work of **"Bruno Colas (181014), Joston Fernandes (181038), Preston Fernandes (181039), Yash Gupta (181050) "** submitted to the University of Mumbai in partial fulfillment of the requirement for the award of the degree of Bachelor of Engineering in Information Technology.

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This literature review report entitled ***"Apparels: E-Commerce Clothing store "*** by ***Bruno Colas (181014), Joston Fernandes (181038), Preston Fernandes (181039) & Yash Gupta (181050)*** is approved for the degree of ***Bachelors of Engineering in Information Technology***.

1. ———————————

2. ———————————

Date:

Place: SFIT

Declaration

I declare that this written submission represents my ideas in my own words and where others' ideas or words have been included, I have adequately cited and referenced the original sources. I also declare that I have adhered to all principles of academic honesty and integrity and have not misrepresented or fabricated or falsified any idea/data/fact/source in my submission. I understand that any violation of the above will be cause for disciplinary action by the Institute and can also evoke penal action from the sources which have thus not been properly cited or from whom proper permission has not been taken when needed.

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ABSTRACT

In today's modern world having an online website business is not only advantageous but also necessary for survival and growth of business. Now a days there is affiliation available for almost all business types but the terms are sometimes not favorable for small businesses. In this project we are particularly targeting clothing sector as it is most affected during the current pandemic times. We aim to provide the sellers a subscription based E-Commerce platform so they have the freedom to choose how much they wish to pay. Our project can also give boost to local businesses and startups as minimal investment would be required and definitely boost digital India campaign. Moreover it will encourage small businesses to widen their reach and be recognized on a global scale.

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Chapter 1

Introduction

1.1 Introduction to domain of project

In this project we aim to develop an online clothing store web application in order to establish the presence of small scale local clothing stores in the global market which can help them to promote their business and thus increase sales. Clothing industry is one of the most affected sectors of business during the covid lockdown period and thus it is very important to make sure that all possible efforts are made to make sure the business flourishes through online means. We aim to provide a secure, scalable and responsive platform for the shopkeeper as well as user. This application also aligns with vocal for local movement. It's easy for other sectors of e-commerce to be affiliated with existing e-commerce platforms like amazon, flipkart but clothing stores need their own independent platform based on their own return policies which is not possible on existing e-commerce stores like Myntra as you need to agree to their terms on conditions to be an affiliate which might not be possible in traditional offline methods.

1.2 Major Challenges in said domain

Having an online business platform can increase the growth in business by 15%-50% . As stated by Stanford University 75% of the customers will make a judgement on the business's credibility based solely on their website. Having a hosted website provides a crucial advantage of staying open 24/7 which might not be possible in traditional offline methods. In this project all possible efforts will be made technical and design point of view to give the visitors an wholesome and user-friendly experience and to overcome challenges like:

i. Finding the right products to sell.

ii. Attracting the perfect customer.

iii. Generating targeted traffic through concepts of SEO.

iv. Capturing quality leads.

v. Nurturing the ideal prospects.

vi. Choosing the right technology.

vii. Retaining customers

viii. Easy returns and good customer service not only pre but also post purchase.

1.3 Motivation

Based on current situations having an online means of selling your product is no longer optional but necessary for progress of the business and more importantly its survival. People no longer wish to physically visit a store for shopping but are always in search of digital means that can provide similar ease of shopping experience and customer service. Most of the current online stores are based on commission model in which the product owner has to be pay a certain percentage of profit (30% to 50%) to the SaaS platform. Famous brands can affiliate with such SaaS platforms but small upcoming brands cannot afford to share 30% to 50% of their profits due to tight margin of profits and growing competition. In this project we aim to develop an affordable Subscription based platform for the textile/clothing/fashion businesses so that they can also establish their presence on the Internet.

1.4 Problem Statement

To develop and design a subscription based responsive, scalable and secure E- Commerce Clothing Store web application using Firebase, React.js and Google OAuth for establishing presence of local stores on a global scale and thus giving stimulus to business and revenue.

Chapter 2

Literature Review

G.Issac, H.Hamzeh, et al.[1] have developed a E-commerce web application with adaptivity and implementation of recommendation methods. The approach used to create such adaptivity methods is described through the analysis of initial requirements, models and designs of the planned solution, and the final implementation of the chosen method using the Web2py Python Model-View-Controller (MVC) framework.Using this logic, we are able to assume that, due to the user being interested in the initial product, they may also be interested in products from the same category which could be considered similar.Once the controller has selected appropriate items to recommend, presently stored in the suggestions variable Iterations of divider creation are completed for each suggested product, displaying product information such as name, image and cost.This system forms both the main ecommerce website and the product review application the system allowed for administrative users to manage products, and regular users to view, and leave reviews on products that are visible to other users.

M.Lawan, et al.[2] have developed a online shopping system using PHP, jQuery, MYSQL, CSS and HTML5. This system follows the concept of 3 tier architecture where the client side is responsible for designing User Interface,

application server side for processing the user request, and the database tier for storing of data. The sole task of a Web Server is to accept incoming http requests and to return the requested resource in an http response. The system was analyzed, design using UML tools, then implemented using PHP, jQuery, MYSQL, CSS and HTML 5 on local host server (XAMPP).The main objective of this project is to develop and implement an e-commerce system with social network flavour where users can buy or add items for trading at the comfort of their homes without barriers of stress, place and geographical location through the internet. The system is designed and programmed to validate users' input. The user type in the Universal Resource Locator (URL) of the system in the address bar of the browser, the Web Server is contacted to get the requested information in the local host server. This system has also incorporated the functions like they have given room for posting and buying items by any user. The users can also bid for items.

S.Oluwaseun, A.Odeh, et al.[3] have developed a E-commerce web application using ASP.NET which provides improved execution, scalability and security. This Web app was designed using VB.NET, C as frameworks. ASP.NET utilizes ADO.NET to interact with the database.MYSQL as back-end language. ASP.NET utilizes ADO.NET to interact with the database as it gives in-memory caching that takes out the need to contact the database server as often as possible and it can without much of a stretch send and keep up an ASP.NET application.NET enables programmers to establish pages or sections of pages that are regularly re-used to be accumulated for a set period to improve the performance of web applications. NET permits the caching of data from a database, so the website is not backing off by successive visits to a database when the data does not change all the time. The objective of this application is to provide the user

an online website where they can find products and its location from the comfort of their home. A store is used for the purpose. The user can select the desired products, place them in the shopping cart for a reserve and go to the location close to their city.

L.Jiang, Y.Cheng, et al.[4] have built a recommender system as an improvement on slope one algorithm .The slope one algorithm does not have not high prediction accuracy .The slope one algorithm does not perform well when dealing with personalized recommendation task that concerns the relationship among users. The improvised slope one algorithm based on the fusion of trusted data and user similarity comprises of three procedures: selecting trusted data, calculating similarity between users, adding this similarity to the weight factor of the improved slope one algorithm and getting the final recommendation.

M.Argyriou, N.Dragoni, et al.[5] have done a case study on security flows in google OAuth frameworks. OAuth framework employs an authorization server for issuing security tokens to different users who request access to protected resources. The authentication schema has four entities (1) the client,the application used by the user for acquiring access to the protected data (2) the the resource owner (relying party), the end user or a host acting on her behalf with the ability to requestaccess to protected resources; (3) the authorization server, that is the issuer ofaccess tokens and assures the authenticity of the owner; and (4) theresource server, the host of the restricted data and consumer of the accesstokens. The OAuth framework heavily relies on the concept of bearer tokens.The two bearer tokens (1)the Access Token, that represents the credentials required toaccess protected resources which defines scope and duration of the access in the authorization grant and the(2) Refresh Token, that are used to obtain new access tokens when the old ones expires.

Table 2.1: Comparison of Various Papers

Sr. No.	Title of Paper	Review	Analysis/Limitations
[1]	E-Commerce application using web framework technology and machine learning	In this paper, adaptivity and recommendation methods have been explored and implemented The final implementation of the chosen method is done using the Web2py Python Model-View-Controller (MVC) framework.	The recommendations in this specific system were inaccurate. The weighted slope one algorithm used was not enough for products categorization according to user requirement and required a content-based recommender and compared to other collaborative filtering recommendation algorithms, both Improved Slope One and Weighted Slope One were outperformed.
[2]	Development and implementation of E-Commerce system	This system follows the concept of 3 tier architecture where the client side is responsible for designing User Interface application server, and the database tier for storing of data. The system was analyzed, designed using UML tools implemented using PHP, MYSQL, CSS and HTML 5 on local host server (XAMPP).	Implementation of payment gateway was not mentioned. This system does not have provision for adding items categorically.

Table 2.2: Comparison of Various Papers

Sr. No.	Title of Paper	Review	Analysis/Limitations
[3]	Implementation of E-Commerce based on cloud computing using ASP.NET technology	This system was built using ASP.NET which provides improve scalability, execution and security. ASP.NET utilizes ADO.NET to interact with the database to give in-memory caching that takes out the need to contact the database server as often and it can without much of a stretch can keep up an ASP.NET application.	The website should provide more functionality, such as looking at a particular client's profile, stores that must be re-ordered and capacity to view the contents of users. The system is not designed for multi-clients.
[4]	A Trust based Collaborative filtering algorithm for E-Commerce recommendation	In this paper a recommender system is build as an improvement on slope one algorithm. The improvised slope one algorithm comprises of three procedures: selecting trusted data, calculating similarity, adding this similarity to the weight factor of the improved slope one algorithm and getting the final recommendation.	No disadvantages mentioned

Table 2.3: Comparison of Various Papers

Sr. No.	Title of Paper	Review	Analysis/Limitations
[5]	Security Flows In OAuth 2.0 Framework: A Case Study	The authentication schema has four entities (1) the client,the application used by the user for acquiring access to the protected data (2) the the resource owner(3) the authorization server, that is the issuer of access tokens and assures the authenticity of the owner; and (4) the resource server, the host of the restricted data.	Vulnerable to attacks like cross site request forgery, session wrapping attack.

Chapter 3

Proposed Methodology

3.1 Problem Formulation

To design a subscription based E-Commerce platform for clothing businesses that can help them to promote their business and boost profits by online means. This system must provide flexibility to the sellers by providing various packages from which seller can chose based on his requirements. The packages are based on number of products the seller can host through his account on the website. The website must follow all the modern day practices in development to ensure that a smooth and wholesome experience is provided to the seller as well as customer. All technical procedures must be followed to ensure that the database is secured from SQL injections and other techniques that can be used to tamper with the database. API can be used to provide an option to login with Google, Facebook to reduce security concerns and it must be ensured that all user and payment credentials are encrypted with hashing functions. UI must be extremely smooth and must be filled with Mobile first approach to ensure responsive design and provide good user experience.

3.2 Problem Definition

To design a scalable web application which can handle functionalities such as logging in, checkout, surfing through products with filters, handling customer reviews ,adding products to cart and proceeding with online payment and provide an affordable alternative to traditional E-Commerce platforms by keeping customer and seller satisfaction as the primary mission.
Problem definition can be satisfied with the help of following objectives:

1. Incorporating payments API by which user can complete the transaction online itself.
2. Developing a fast and responsive User Interface which ensures responsiveness and reusability of code.
3. Using hash functions and other cryptography methods for securing the details of users.
4. Hosting the website on a scalable platform.

5. Developing a subscription based E-Commerce platform where the seller only has to pay for the amount of products he/she wishes to host.

3.3 Scope

Due to corona virus people tend to avoid crowded places as shopping via traditional means while visting a store is not safe. Startup can have a platform for selling their products without the requirement of a physical store. We aim to develop a Full-Stack E-commerce website which handles every aspect right from surfing through products to payments and delivery. Since this website is a subscription based model the seller only has to pay for the amount of products he wishes to host.

3.4 Proposed Methodology/Algorithm

- In this project we aim to develop a system which can have high efficiency using React.js (frontend library) as it allows reusability of code.
- We will also incorporate Online payments option using stripe API for buying products.
- The products will be categorically filtered and the users can leave their feedback based on the purchased product.
- Security related to User details such as login credentials, payment (credit-card) information will be highly secured using Google OAuth API and google firebase.
- We aim to develop a scalable restful API which can handle backend interactions smoothly.
- Description of Subscription Based Model.
    i. Seller registers himself on the platform and after agreeing to the terms and conditions the subscription plans page is showed.
    ii. The seller choses from the available subscription plans which will be as follows Silver Plan, Gold Plan, Platinum Plan and Diamond Plan.
    iii. Silver Plan will allow the seller to host 50 products, Gold Plan will allow the seller to host 200 products, Platinum Plan will allow the seller to host 500 products and the Diamond Plan will allow the seller to host 1000 products on the website.
    iv. After choosing a suitable plan the seller will have to fill a form which will ask for certain details regarding return policy after which the seller can proceed to pay for the chosen package.
    v. On successful payment the plan will be activated and the seller can add products he wishes to host.
    vi. An alternative will also be provided that all the above steps will be done by the website executive for the seller.

3.5 Features of proposed System

1. Security
   For this system we will be using Google Firestore which is a cloud hosted NoSQL database and Google OAuth API for login system hence user details like name, email, password, debit or credit card details will be highly encrypted.

2. Scalable and Responsive
   The system will be responsive and can be used on various platforms like Desktop, Laptop and Mobile and can handle data of multiple users and owners.

3. Low setup and running cost
   There is no need of physical space in order to run the business the business owner can register themselves and can run the complete business through online means.

4. Higher Margins and Profit
   By running a business online there is a chance of increase in sales as the traffic on the website increases and some cost can also be cut in areas like rent for a physical shop.

5. Less time intensive
   By having a website up and running a business has an advantage of staying up and running 24/7 which is not possible through offline means.

Chapter 4

System Analysis

4.1 Functional Requirements

- Registration for Seller / Customer.
  The system must provide separate registration pages for customer and seller as the features and functionalities for both are different.
- Buying a subscription plan (Seller)
  The system must provide functionality of buying a subscription plan for the seller so that he/she can use the functionalities.
- Adding a product (Seller) The functionality of adding a product on the store is provided to the seller where the seller fills a form to add a product on to the store.
- Removing a product (Seller / Admin)
  Seller can remove product from the store if he/she wants to discontinue it. Admin can also remove a product if there are complaints from the customer.
- Buy product (Customer)
  The customer can add products to cart he/she wishes to purchase.
- Add to wishlist (Customer)
  Customer can add a product to wishlist which is saved and can be moved to cart later.
- Payment (Customer)
  The customer should be able to pay via online means for the products he/she wishes to purchase.
- Remove seller account (Admin)
  The admin must be able to terminate a seller account if certain rules or conditions are not followed

4.2 Non-Functional Requirements

- Atomicity
  During payment it must be ensured that even if 1 process fails then the entire payment activity must be aborted for that session.
- Consistency
  The database must be consistent changes done on the database must be updated on all the devices.
- Isolation
  Individual process should be able to be isolated.
- Durability
  The changes on the database must persist.
- Less time Intensive
  By having a website up and running a business has an advantage of staying up and running 24/7 which is not possible through offline means.
- Usability
  The System must be user friendly and UI/ GUI must be readable and must follow modern design patterns and principles of color coding, sizing, typography.
- Robustness
  System should be able to cope with improper input formats through input validations.
- Reliability
  The system must be reliable for the customer to make payment and it must be ensured that user credentials are secured on the database and that no attacks on the system must be possible during the process.
- Low setup and running costs
  There is no need of physical space in order to run the business the business owner can register themselves and can run the complete business through online means.
- Higher Margins of profit
  By running a business online there is a chance of increase in sales as the traffic on the website increases and some cost can also be cut in areas like rent for a physical shop .
- Interoperability
  The system must be cross platform compactible to ensure that both IOS and Android users can use the website. The communication with the server side and the database must be smooth to ensure that there is no delay for the user.

4.3 Specific Requirements

Hardware :

- CPU : Ryzen R3 1200 (Quad core)
- RAM : 8GB or above.
- Intel Processor : I3 10th gen.
- Operating System : Windows 10.
- Internet connection : 1 mbps or above.

Software :

- Text editor : Microsoft Visual Studio code
- Web Browser : Google chrome
- Open Source Runtime Environment and libraries : Node.js, React.js, Express.js, GraphQL etc

4.4 Use-Case Diagrams

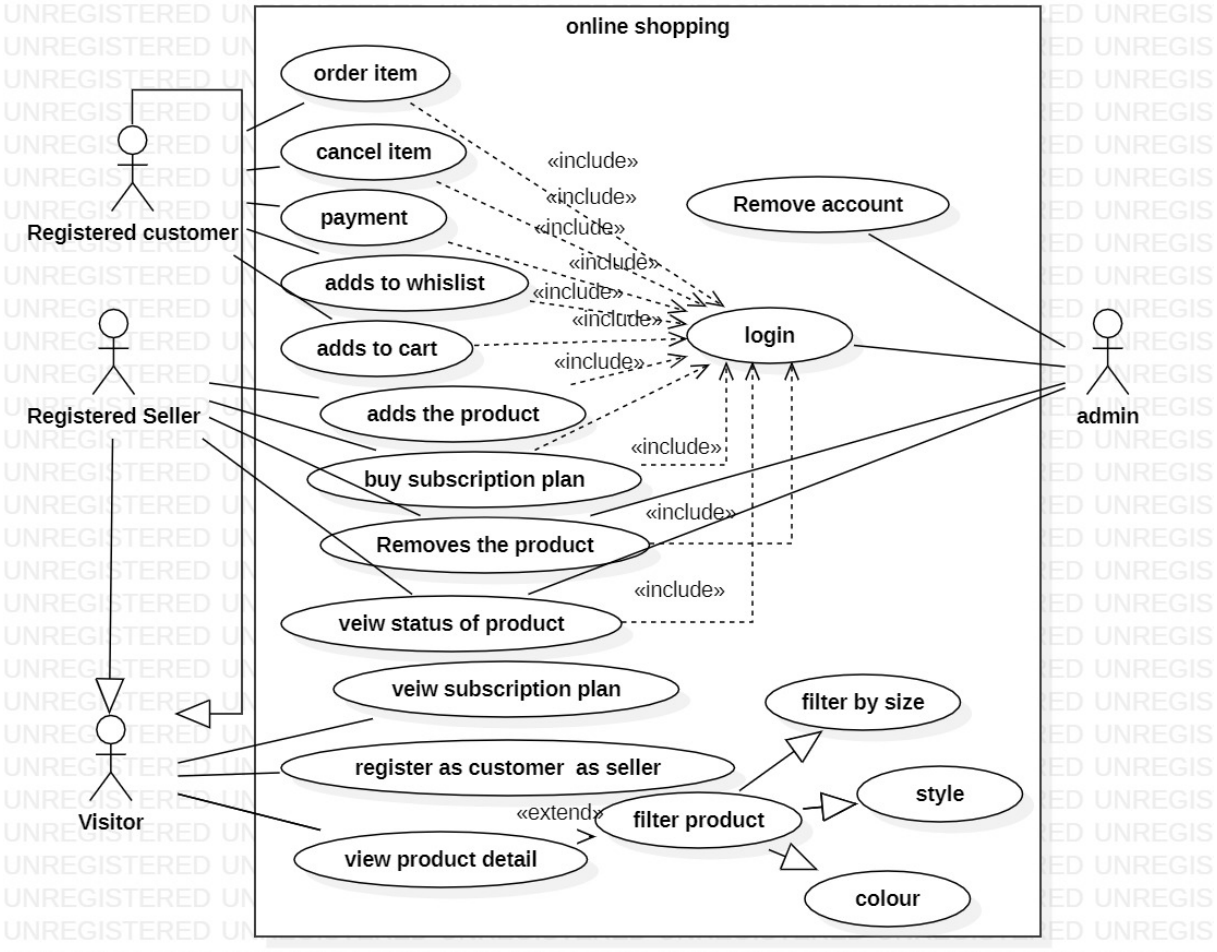

Figure 4.1: Use Case Diagram

Table 4.1: Use Case Diagram Description for visitor

Actors	Visitor
Purpose	To register the user on the platform
Overview	This case deals with how the user will be registered on the platform. If visitor wishes to register as seller he/she has to pay for the chosen subscription plan.
Pre-condition	Proper Internet Connection Servers should be running Certain credentials inputted by the user must not be repeated in the database that is to check if the user has already registered
Post-condition	The user has successfully registered either as a seller or customer.

Table 4.2: Typical Events

Actor Action	System Response
Visitor requests for register page	The systems displays the registration page
Visitor fills the required information	The System validates the information and throws either success or failure message.
(If visitor is seller)Seller selects a plan and proceed to pay	System confirms the details and confirms the payment with success message if there are no errors

Table 4.3: Alternative Course of Events

Actor Action	System Response
User entered information does not match the requested format	Validation throws an error
Form is not submitted due to server load	System throws an error
(If visitor is seller)Seller selects a plan and proceed to pay	System confirms the details and confirms the payment with success message if there are no errors

Table 4.4: Use Case Diagram Description for customer/seller login

Case Name	Sign In / Log In
Actors	Customer/Seller
Purpose	To sign in and use the functionalities
Overview	Certain functionalities like adding to cart, adding to wishlist, adding product will require the user to sign in
Cross Reference	If credentials match with the details given while registering then the user is successfully logged.
Pre-condition	Stable Internet Connection Servers must be up and running The user must have registered first
Post-condition	The user has successfully logged in

Table 4.5: Typical Events

Actor Action	System Response
Visitor requests for Sign in page	The systems displays the sign in page
Visitor fills the required information	The System validates the information and throws either success or failure message.

Table 4.6: Alternative Course of Events

Actor Action	System Response
User entered information does not match the requested format	Validation throws an error
Form is not submitted due to server load	System throws an error
User entered credentials don't match the details mentioned while registering	System throws Authentication error

Table 4.7: Use Case Diagram Description to add a product

Case Name	Add a product
Actors	Seller
Purpose	To add a product on the store
Overview	After successfully signing in as seller there will be option to add a product where the seller fills a form that has details of the product
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as seller
Post-condition	The seller has successfully added a product on the store

Table 4.8: Typical Events

Actor Action	System Response
Seller requests for Add product page after successful login	The systems displays the add product page
Seller fills the required information	The System validates the information and throws either success or failure image

Table 4.9: Alternative Course of Events

Actor Action	System Response
User entered information does not match the requested format	Validation throws an error
Form is not submitted due to server load	System throws an error
User entered product already exists	System throws error

Table 4.10: Use Case Diagram Description to delete a product

Case Name	Delete a product
Actors	Seller, Admin
Purpose	To delete a product on the store
Overview	After successfully signing in as seller there will be option to manage products where the seller can delete the product
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as seller
Post-condition	The seller has successfully deleted the product from the website

Table 4.11: Typical Events

Actor Action	System Response
Seller (after successful log in) requests for manage products page	System generates the manage products page where all the products added by the seller are shown
Seller selects delete product button on a particular product after successful log in	The systems asks for confirmation
Seller fills the required confirmation	The System validates the information and throws either success or failure image

Table 4.12: Alternative Course of Events

Actor Action	System Response
User entered information does not match the requested format	Validation throws an error
Form is not submitted due to server load	System throws an error

Table 4.13: Use Case Diagram Description to update a product

Case Name	Update a product
Actors	Seller
Purpose	To update a product on the store
Overview	After successfully signing in as seller there will be option to update a product where the seller fills a form that has details of the product
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as seller
Post-condition	The seller has successfully added a product on the store

Table 4.14: Typical Events

Actor Action	System Response
Seller (after successful log in) requests for manage products page	System displays the manage products page
Seller selects update product button after successful log in	The systems displays the form to update the information
Seller fills the required information	The System validates the information and throws either success or failure image

Table 4.15: Alternative Course of Events

Actor Action	System Response
User entered information does not match the requested format	Validation throws an error
Form is not submitted due to server load	System throws an error

Table 4.16: Use Case Diagram Description for filtering products

Case Name	Search/filter a product
Actors	Customer, Visitor
Purpose	To search for a product as a customer
Overview	After successfully signing in as customer the customer can apply filters to search for a specific product
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as customer Required filters must be applied
Post-condition	The products are filtered and shown on the page based on the selected parameters

Table 4.17: Typical Events

Actor Action	System Response
Customer (after successful log in) is on the home page	System displays the products and the filtering parameters that can be selected
Customer selects the checkboxes for the required filters	The systems shows a tick besides the selected filters
Customer clicks on the search button	The System shows the product that meet the filtering criteria

Table 4.18: Alternative Course of Events

Actor Action	System Response
Customer selects filters	No product to display based on selected filters Or an error message is thrown if database has not responded

Table 4.19: Use Case Diagram Description to add product to cart

Case Name	Add a product to cart
Actors	Customer
Purpose	To add a product on the cart
Overview	After successfully signing in a customer can add a product he/she wishes to purchase to cart
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as customer
Post-condition	The product has successfully added to cart and can be viewed in cart

Table 4.20: Typical Events

Actor Action	System Response
Customer clicks on add to cart button next to the product he/she wishes to purchase	System adds the product to cart
Customer clicks on the cart icon to view items in the cart	The systems displays the contents of the cart

Table 4.21: Alternative Course of Events

Actor Action	System Response
Visitor clicks on add to cart	System displays the login page for visitor as only registered customers can add products to cart
Customer clicks on add to cart	System displays error message if the database does not respond or if total number of products in database has not been rendered.

Table 4.22: Use Case Diagram Description to remove product from cart

Case Name	Remove a product from cart
Actors	Customer
Purpose	To remove a product from the cart
Overview	After successfully signing in a customer can remove a product that was previously added to cart
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as customer
Post-condition	The product has successfully been removed from cart

Table 4.23: Typical Events

Actor Action	System Response
Customer clicks the cart icon	System displays the items in the cart
Customer clicks on remove from cart button next to the product he/she wants to remove	System removes the product from cart and displays the items in the cart

Table 4.24: Alternative Course of Events

Actor Action	System Response
Customer clicks on removes from car	System displays error message if the database does not respond

Table 4.25: Use Case Diagram Description for payment method

Case Name	Complete payment for the products to be purchased
Actors	Customer, Seller
Purpose	To make payment for the products
Overview	After successfully signing in a customer can add a product he/she wishes to purchase to cart and then can proceed to make payment for the products. Seller also pays for the chosen subscription plan
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as customer/seller
Post-condition	The payment is successful and customer can view in my orders page

Table 4.26: Typical Events

Actor Action	System Response
Customer clicks on add to cart button next to the product he/she wishes to purchase	System adds the product to cart
Customer clicks on the cart icon to view items in the cart	The systems displays the contents of the cart
Customer clicks on proceed to checkout	The system displays the checkout information on page
Customer either confirms the address or enters the address for delivery and proceeds to pay	System generates a page with summary of order and shows the available mode of payment
Customer selects one from the available payment options	The system displays a form to fill the credentials of online payment
Customer confirms the details and proceeds to make payment	The system requests for the OTP
Customer enters the OTP	System generates success message if payment is successful

Table 4.27: Alternative Course of Events

Actor Action	System Response
Visitor clicks on add to cart	System displays the login page for visitor as only registered customers can add products to cart
Customer clicks on make payment	System displays error message if the database does not respond or if total number of products in database has not been rendered or if the bank servers are down

Table 4.28: Use Case Diagram Description to cancel order

Case Name	Cancel order
Actors	Customer
Purpose	To cancel an order
Overview	After successfully signing in a customer he/she can view products he/she has ordered and can cancel them based on certain terms and conditions
Pre-condition	Stable Internet Connection Servers must be up and running The user must be logged in as customer
Post-condition	The order has been cancelled

Table 4.29: Typical Events

Actor Action	System Response
Customer clicks on my orders button	System displays the my orders page
Customer clicks on the order	The systems displays the details of the order
Customer clicks on cancel order button	The system asks for confirmation
Customer confirms he/she wishes to cancel the order	System cancels the order and generates a message regarding return of money.

Table 4.30: Alternative Course of Events

Actor Action	System Response
Customer clicks on my order page	System displays error message if the database does not respond
Customer clicks on cancel order	If terms and conditions are not satisfied the system displays error message that order cannot be cancelled

Table 4.31: Use Case Diagram Description to remove seller account

Case Name	Remove seller account
Actors	Admin
Purpose	To terminate seller account
Overview	Admin can remove a seller account if the seller does not renew package after deadline or if the seller does not follow company policy
Pre-condition	Stable Internet Connection Servers must be up and running Only database admin can access the feature
Post-condition	The seller account is terminated

Table 4.32: Typical Events

Actor Action	System Response
Admin logs in on to the website	System displays the functionalities available to the admin
Admin searches for the account to be terminated	System displays the seller account that matches the parameters
Admin clicks on the terminate account button	System asks for confirmation from the admin and asks to input the key
Admin confirms with the password	SThe system displays message that seller account has been deleted

Table 4.33: Alternative Course of Events

Actor Action	System Response
Admin logs in on to website	The functionalities are not displayed due to server error
Admin enters the incorrect password	The system displays error message

Literature Cited

[1] G.Issac,H.Hamzeh,S.Meacham,A.Stefanidis,"An Adaptive E- Commerce Application Using Web Framework Technology and Machine Learning", in Conf. *BCS Software Quality Management (SQM)*, Dorset BH12 5BB,UK,pp.101-112,Mar 2018.

[2] M.Lawan,"Development and Implementation of E-Commerce System", *International Journal of Advanced Research in Computer Science*,vol.9,no.1,pp.900-906,Mar 2018.

[3] S.Oluwaseun,A.Odeh,E.Joshua," Implementation of E-Commerce based on Cloud Computing Using ASP.NET Technology", in Conf. *International Journal of Advanced Science and Applied Management*,vol.2,no.7,pp.61-76, Jul 2016.

[4] L.Jiang,Y.Cheng,L.Yang,J.Li,"A Trust-Based Collaborative Filtering Algorithm for E-Commerce Recommendation", *Journal of Ambient Intelligence and Humanized Computing*,pp.3023–3034,Aug 2019.

[5] M.Argyriou,N.Dragoni,A.Spognardi,"Security Flows in OAuth 2.0 Framework:A Case Study", in Conf. *International Conference on Computer Safety, Reliability, and Security*,pp.396-406,Sep 2017.