EASY BUY

A PROJECT REPORT

Submitted By

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Submitted in partial fulfillment of the Requirements for the Degree of

MASTER OF COMPUTER APPLICATIONS

Under the Supervision of
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Submitted to

DEPARTMENT OF COMPUTER APPLICATIONS
KIET Group of Institutions, Ghaziabad Uttar Pradesh-201206
(FEB 2023)

CERTIFICATE

Certified that **Yogesh Sharma (University Roll No- 2100290140156),Mohika Rastogi(University Roll No- 2100290140086),Sagar Kumar (University Roll No- 2100290140115),Koshinder Chauhan (University Roll No- 2100290140076)** has carried out the project work having "**Easy Buy**" for Master of Computer Applications from Dr. A.P.J. Abdul Kalam Technical University (AKTU) (formerly UPTU), Technical University, Lucknow under my supervision. The project report embodies original work, and studies are carried out by the student himself /herself and the contents of the project report do not form the basis for the award of any other degree to the candidate or to anybody else from this or any other University/Institution.

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ABSTRACT

Recently the e-commerce platform is playing an important role in some areas; its activities are a subset of e-business activities. The aim of this paper is to build and develop a reliable website based on the e-commerce theories, developing effective well designed web pages. This website will sell computer products include (hardware and software).For implement the selling online website, it needs to use current technologies to achieve this goal. As a first stage, it should setting up online e-commerce store with easy-to-use. Then improve the customer experience, and lastly implement the Direct Online Sale between business to consumer by implement electronic payment methods. All these techniques should be based on deliberated plan according to strategy of electronic commerce with implement the current technology to ensure a good revenue to the company.

ACKNOWLEDGEMENTS

Success in life is never attained single-handedly. My deepest gratitude goes to my thesis supervisor, **Mr. Ankit Verma Sir** for his guidance, help, and encouragement throughout my research work. Their enlightening ideas, comments, and suggestions.

Words are not enough to express my gratitude to **Dr. Arun Kumar Tripathi Sir** Professor and Head of the Department of Computer Applications, for his insightful comments and administrative help on various occasions.

Fortunately, I have many understanding friends, who have helped me a lot in many critical conditions.

Finally, my sincere thanks go to my family members and all those who have directly and indirectly provided me with moral support and other kinds of help. Without their support, the completion of this work would not have been possible in time. They keep my life filled with enjoyment and happiness.

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LIST OF CHAPTERS

CHAPTER 1
INTRODUCTION

1.1 PROJECT DESCRIPTION

E-commerce is fast gaining ground as an accepted and used business paradigm. More and more business houses are implementing web sites providing functionality for performing commercial transactions over the web. It is reasonable to say that the process of shopping on the web is becoming commonplace.An online store is a virtual store on the Internet where customers can browse the catalog and select products of interest. The selected items may be collected in a shopping cart. At checkout time, the items in the shopping cart will be presented as an order. At that time, more information will be needed to complete the transaction.Usually, the customer will be asked to fill or select a billing address, a shipping address, a shipping option, and payment information such as credit card number. An e- mail notification is sent to the customer as soon as the order is placed.The Title of the project is "EasyBuy". It is an E-commerce website that will allow users to buy products online. User will be required to login to buy the product .He/she can add the required product to the cart and then to buy it he/she can checkout and provide the shipping address.As the user clicks the checkout option a notification is triggered to the vendor and product can be delivered.

1.2 PRESENT CHALLENGES FACING BY E-COMMERCE

Speaking of obstacles, there are a lot of them that need to be uprooted before e-commerce can compete with traditional commerce. The biggest obstacle in the course of advancement of e-commerce is that the consumer's senses are limited to seeing and hearing the product. The second largest problem that e-commerce has been facing over the past few years is that of security.Despite all the noise about e-commerce, which is significant, companies still have to keep their old business practices: Can I trust who I am buying from? Who am I doing business with? What is their trading history? Am I obeying the law? Will I receive the goods as specified on screen and who do I approach if I have a problem?". According to emarketer.com, "70% of US consumers are concerned about online security; this discourages consumers from using credit cards to shop online (PaymentOne)". Also according to e-marketer.com, in December 2001, 91% of websites collected personal information and in April-May 2001, 68% of US Internet users were concerned that transactions may not be secure and other companies and individuals might gain access to their personal information

1.3 PROBLEM STATEMENT

Traditionally, customers are used to buying the products at the real, in other words, factual shops or supermarkets. It needs the customers to show up in the shops in person, and walk around different shopping shelves, and it also needs the owners of shops to stock, exhibit, and transfer the products required by customers. It takes labour, time and space to process these operations. Furthermore, the spread of the Covid-19 pandemic has caused a lot of changes in our lifestyle, people fearing to get outside their homes, transportation almost shut down and social distancing becoming all the more important. Big to small scale business that relied on the traditional incur a lot of consequence due to the lockdown issues. Some tend to more towards using social media platforms like Facebook to sell their product. However, the social media platforms have been beneficial for marketing purposes alone but leaves the whole task of customer and massive order management via direct messaging (DM), which takes a lot of time to respond to all customers. In addition, everyone tends to use social media, posing a great challenge to differentiate between scammers (fraudsters) and legit sellers

1.4 SOLUTION

In order to develop an e-commerce website that is fast and easy for a customer to interact with, we propose to build website named 'EasyBuy' for which a number of Technologies must be studied and understood. These include multi-tiered architecture, server and client side scripting techniques, implementation technologies such as ASP.NET, programming language (such as C#) and relational databases.

EasyBuy is an Online shopping system provides a solution to reduce and optimize these expenses. Authorized Customers do not need to go to the factual shops to choose, and bring the products they need by hands. They simply browse their Personal computers or cell phones to access shops, and evaluate the products description, pictures on the screen to choose products. In addition, the owners of the shop do not need to arrange or exhibit their stocks products. They just input the description, prices of products, and upload their pictures. Simply, both customers and shop owners do not need to touch the real products in the whole process of shopping, and management. In the end the logistic centre will distribute the products required by customers, or products ordered by shop owners to their locations.

The customers are able to track the status of their orders until delivery, after which they can leave a review of the type of service they received. The payment and products quantity will be saved in database through the data flow. These shopping, management and distribution processes greatly simplify and optimize the retail business. This is a project with the objective to develop a basic website where a consumer is provided with a shopping cart application and also to know about the technologies used to develop such an application. This document will discuss each of the underlying technologies to create and implement an ecommerce website. Furthermore, this document depicts the process involved in building the e-commerce website named EasyBuy.

1.5 OVERALL OBJECTIVE

The objective of this project is to develop a general-purpose e-commerce store where any product (such as books, CDs, computers, mobile phones, electronic items, and home appliances) can be bought from the comfort of home through the Internet. However, for implementation purposes, this paper will deal with an online book store.

The primary objectives for this project are:

1. Create a set of requirements for a Website CMS for small businesses based on research.
2. Build and test a prototype of a Website CMS for small businesses based on the requirements found.
3. Knowing when an item was saved or not saved in the shopping cart.
4. Returning to different parts of the site after adding an item to the shopping cart.
5. Easy scanning and selecting items in a list.
6. Effective categorical organization of products.
7. Simple navigation from home page to information and order links for specific products.
8. Obvious shopping links or buttons.
9. Minimal and effective security notifications or messages.

1.5 HARDWARE & SOFTWARE SPECIFICATIONS

1.5.1 HARDWARE SPECIFICATIONS

Processor	11th Gen Intel(R) Core(TM) i3
System Type	32-bit operating system
Speed	3.00 GHz
Hard Disk Space	256 GB
RAM Memory	4 GB
Operating System	Windows 8

1.5.2 SOFTWARE SPECIFICATIONS

Database Management System	POSTMAN, SQL Server Management Studio
Development Environment(IDE)	.NET CORE , Visual Studio 2022
Code Editor	Visual Studio Code

CHAPTER 2

LITERATURE REVIEW

2.1 ABSTRACT

Electronic Commerce is process of doing business through computer networks. A person sitting on his chair in front of a computer can access all the facilities of the Internet to buy or sell the products.
Unlike traditional commerce that is carried out physically with effort of a person to go & get products, e commerce has made it easier for human to reduce physical work and to save time. E-Commerce which was started in early 1990's has taken a great leap in the world of computers, but the fact that has hindered the growth of e-commerce is security. Security is the challenge facing e-commerce today & there is still a lot of advancement made in the field of security.
The main advantage of e-commerce over traditional commerce is the user can browse online shops, compare prices and order merchandise sitting at home on their PC.
For increasing the use of e-commerce in developing countries the B2B e-commerce is implemented for improving access to global markets for firms in developing countries. For a developing country advancement in the field of e-commerce is essential.

2.2 INTRODUCTION

E-commerce is fast gaining ground as an accepted and used business paradigm. More and more business houses are implementing web sites providing functionality for performing commercial transactions over the web. It is reasonable to say that the process of shopping on the web is becoming commonplace.
An online store is a virtual store on the Internet where customers can browse the catalog and select products of interest. The selected items may be collected in a shopping cart. At checkout time, the items in the shopping cart will be presented as an order. At that time, more information will be needed to complete the transaction.
Usually, the customer will be asked to fill or select a billing address, a shipping address, a shipping option, and payment information such as credit card number. An e- mail notification is sent to the customer as soon as the order is placed.
The Title of the project is " EasyBuy". It is an E-commerce website that will allow users to buy products online. User will be required to login to buy the product .
He/she can add the required product to the cart and then to buy it he/she can checkout and provide the shipping address.
As the user clicks the checkout option a notification is triggered to the vendor and product can be delivered.

2.3 LITERATURE REVIEW

Literature review is an expressive study based on the detailed review of earlier pertinent studies related to the various concepts of online shopping to discover the concept of online shopping. It highlights the status of online shopping, importance and problems of online shopping, factors affecting online shopping and a critical review of the privacy and security issues in online shopping.

2.3.1 STATUS OF ONLINE SHOPPING IN PRESENT BUSINESSES

Online buying behaviour is affected by various factors like, economic factors, demographic factors, technical factors, social factors, cultural factors, psychological factors, marketing factors and legislative factors. Customers choose an online-shop mainly based on references, clarity terms of delivery, graphic design and additional services. Problematical customers read discussions on the Internet before they spend their money on-line and when customers are incapable to purchase the product fast and with no trouble they leave online-shop.

Kotler, (2003) described Consumer buying method as learning, information-processing and decision-making activity divided in several consequent steps: Problem identification, Information search, Alternatives evaluation, Purchasing decision, Post-purchase behaviour. Euthymia identified the main constituent of the online shopping experience as follows: the functionality of the Web site that includes the elements trade with the site's usability. the emotional elements planned for lowering the customer's hesitation by communicating trust and credibility of the online seller and Web site and the content elements including the aesthetic aspects of the online presentation and the marketing mix. Usability and trust are the issues more regularly found to influence the online consumer's behaviour. Karayiannis, examined that discriminating of potential determinants between web- shoppers and non-shoppers.

Free shipping is a great motivator to purchase the products and customers are willing to pay nominal charges for getting their products. While compare the shopping with others shopping, consumers take product price and shipping charges almost equally into deliberation. There are some ways that retailers can do to improve the experience for their online shoppers. The first is to write the expected delivery date of the order, customers are willing to wait for their orders but want to know just how long that force is. Timely coming of product shipment encourages shoppers to recommend an online retailer. Consumers also want to track updates and delivery notifications to understand when their package is incoming.

Online shoppers want flexibility in their shipping, mainly the ability to give special delivery instructions or schedule a delivery time. Customers are also wanting to get the address changing option for filling the wrong address when they are purchasing online.

2.3.2 IMPORTANCE OF ONLINE SHOPPING

Ling, said that customers can take enjoy online shopping for 24 hour per day. Consumers can purchase any goods and services anytime at everywhere. Online shopping is user friendly compare to in store shopping because consumers can just complete his requirements just with a click of mouse without leaving their home. Online shopping has some advantages like below

- Save the Time of the consumers.
- They can purchase any time anywhere.
- They can compare the price with the others retailers very easily.
- Compare the advertising price and actual price.
- They can easily track their product.
- They can use cash back policy.
- They can purchase the product from the foreign marketers.

2.3.3 PROBLEMS OF ONLINE SHOPPING

Online shopping problems are great barrier to the online purchase aim of customers. General problems include prospect of having credit card. The obscurity to confirm the reliability of the provide goods and the risk to buy a product that it would not value as much as customer pay for it. After-sales problems, involved difficulty to change not working product with a new one and products warranty are not assured. Online shopping has various disadvantages:

- The customers can not touch and fell of the products when they want to Purchase.
- Some time delivery time is so much late
- Some time they will pay the shipping charges so why the cost of the product may increase.
- Lack of personal attention by the sellers. More chance to fraud.
- Security of internet banking password and credit card password
- Lack of quality

2.3.4 PRIVACY AND SECURITY ISSUES IN ONLINE SHOPPING

Shopping online has never been so easy. With the flourishing numbers of online merchants, people nowadays have various choices to do their shopping. Big companies such as eBay and amazon.com have introduced many values added features to help the customers to decide what to shop for. With features such as price comparison, product photos and user reviews, consumers can shop easily and smartly without even going to the stores and having such a hard time looking for the products they want. All they have to do are just browse for the product they want in the website and within a few mice clicks they are off. Such simplicity is what makes online shopping appealing for consumers. The question is, why do many people still deny to shop online? Well, for most people, privacy and security issues are their concerns. Hence, here I will discuss customers' perception of privacy and security issues, the reality of such issues and ways to avoid those issues, all based on some trustworthy sources I have found.

To know customers' perception of customer and security issues, I reviewed a scholarly article entitled "Consumer Perceptions of Privacy and Security Risks for Online Shopping" produced in the Journal of Consumer Affairs. In the United States, more than half of the adult population uses

the Internet and from that number, approximately half have shopped online. Previous studies had shown that Internet users as a whole agreed that privacy and security issues are vital for them to shop online. Most of them regard their personal information as their main concern. In the research conducted by Miyazaki and Fernandez, who are the authors of the articles themselves, privacy and security issues accounted for more than 65 percent of consumers' main concern as oppose to the other 35 for shopping inconveniences and others. They also concluded that more experienced Internet users tend to have more concern regarding privacy issues but less concern on security issues. Nevertheless, consumers still consider both as their main concern for online shopping as suggested in the survey.

Now, after knowing that privacy and security issues are vital for consumers in online shopping, I would like to know the emphasis in the real world. From an article titled "The Myth of Secure E-Shopping" published in PC World, the reality of such issue is revealed. While most consumers trust big and well-established online merchant such as CD Universe, Travelocity, Columbia House and Ikea, these big companies still receive frequent security threats (Kandra, 2001). Joseph McDonnell, a CEO of online security firm IShopSecure even confessed that all online firms must have received threats of some sorts (Kandra, 2001). He added by saying that hackers could easily infiltrate and get customers personal information online as online shoppers are not anonymous. According to Kandra, experts also discover that security measures taken by online retailers are insufficient. For instance, data encryption only applies in actual transfer of customer data but not in the database which is ironically the most common targets for hackers. Some other sites however, do not even have privacy and security policy posted implying that they do not protect their customers (Hairell, 2011). Kandra posits that this is what happened to eBay when it was hacked hence compromising its customers' credit information. Apart from the retailers themselves, credit card processing firms and third-party sites also receive threats. Creditcards.com once had disclosed that someone had infiltrated its site and posted more than 55000 credit card numbers on the Internet. So, from all these indications, I can see that online shopping is not totally safe.

However, customer rights and security aspects are not just the responsibility of online merchants. To uphold them, the consumers themselves need to act. According to "Ten Things Your Mother Never Told You About Online Shopping" published in Yahoo! Internet Life, to be an ace consumer, online shoppers need to prepare themselves with some basics (Halpin, 2011). As the prominent method of payment is credit card, consumers should be more aware in handling it. They should never disclose their credit information via e-mail. Some of the credit card issuers also have some sorts of protection that consumers should apply for. Apart from that, consumers should limit themselves from releasing unnecessary personal information such as age and income to protect their privacy (Hood & Halpin, 2011). Also, as Todd Richter who is the president of Girl shop (an ecommerce site) had said, consumers should always be aware of the security technology used by merchant sites. Technologies such as Secure Socket Layer (SSL) and VeriSign play vital part in distinguishing one site from another. Nonetheless, consumers should always be alert of the privacy and customer policy in each site they tend to buy from (Halpin, 2011). Lastly, if there are still dissatisfactions, consumers could always report them to consumer-related agencies such as Better Business Bureau or Federal Trade Commission (Halpin, 2011).

Thus, after reviewing these three reliable sources related to the privacy and security issues of online shopping, I can see some interconnections between them. By common sense, anyone who tends to shop online will think twice before they buy anything as to consider the privacy and security issues related to it. This is proven in my first source ("Consumer Perceptions of Privacy and Security Risks for Online Shopping") through the survey. People are always conscious about

their privacy and security. However, this is not the case in the real world. As my second source ("The Myth of Secure E-Shopping") has proposed, even though online merchants have tried their best to beef up the security, threats and attacks still prevail. For this reason, consumer should act fast to protect their privacy when shopping online. My third source ("10 Things Your Mother Never Told You About Online Shopping") explains many ways that consumers could do to enhance the privacy and security aspect apart from what online merchants have done for the same reason. Taking all these contents as a whole, I would say that in any situation, people can still shop online safely provided they understand the reality and take some precautions above all.

2.4 LITERATURE SURVEY

The purpose of this study is to empirically investigate the dimensions and drivers of entrepreneurial perceptions in the pursuit of emerging e-business opportunities for traditional (or offline) firms. This study introduces the subjectivist theory of entrepreneurship into the IS research context, and identifies three dimensions that make up entrepreneurial perceptions: collaboration perception, planning perception, and operation perception. The authors tested the proposed research model using structural equation modelling (SEM) with survey data collected from 203 firms in China. Results reveal that external pressures and IT infrastructure maturity are positively and significantly related to entrepreneurial perceptions. The results also suggest that IT infrastructure maturity has stronger effects on collaboration perception and planning perception than external pressures. This paper provides clear guidance for entrepreneurs to understand the three entrepreneurial perceptions for emerging e-business opportunity discovery and the driving forces to the entrepreneurial perceptions.[1]

Due to the problems of poor evaluation accuracy and low evaluation efficiency existing in traditional social e-commerce platform user trust evaluation methods, a social e-commerce

platform user trust evaluation method based on artificial neural network is proposed. According to the business factors, environmental factors and social factors, the evaluation system of user trust degree of social e-commerce platform is constructed, so as to build the objective function of user trust degree evaluation index weight calculation of social e-commerce platform. The objective function is optimised by using an artificial neural network to obtain the evaluation index weight, and the evaluation model is constructed combined with the calculation results, completing the user trust evaluation of the social e-commerce platform. Simulation results show that the proposed method has higher accuracy and shorter evaluation time.[2]

According to data published by the Spanish Foreign Trade Institute(ICEX, 2021), 84.5 % of households in Portugal had access to the Internet in 2020, that is, 3.6 percentage points more than in 2019. Likewise, the Internet penetration rate among the Portuguese population between the ages of 16 and 74 increased, going from 76.2 % in 2019 to 78.3 % in 2020 and, the penetration rate of online buyers was 56 %, below the EU-27 average of 72 %. According to Statista, Portugal ranked 43rd in the world income level in the B2C e-commerce market, with a turnover of € 3,054 M in 2020, experiencing a growth of 19.5 % compared to 2019. According to CaixaBank Research (2021), these figures show a reduction in in-store purchases and the willingness of Portuguese consumers to respect social distancing. This is also confirmed by Eurostat data (2021), where the

percentage of people between the ages of 16 and 74 who made online purchases of goods and services over the last 12 months increased to 45 % in 2020 (it was 39 % in 2019), well above past growth trends. Portuguese adopters consider that the most important e-commerce qualities are detailed information, timeliness, ease of comparison and comfort (Oliveira & Reis, 2006). On the other hand, in Spain, according to the National Statistical Institute (INE, 2021) 93.9 % of the population aged 16 to 74 has used the Internet in the last three months, 0.7 points more than in 2020. This represents a total of 33.1 million users. Internet use is a majority practice among young people aged 16 to 24, with 99.7 % for men and 99.6 % for women. Following Valarezo Unda et al. (2021), the Spanish online consumer is an employed male, with higher education and income levels and digital skills. As age increases, Internet use decreases in both men and women, with the lowest percentage corresponding to the group aged between 65 and 74 years old (74.6 % for men, and 72.0 % for women). Furthermore, according to the Spanish National Markets and Competition Commission (CNMC, 2022), e-commerce in Spain reached a turnover in the second quarter of 2021 that was 13.7 % higher in year-on-year terms, accruing a total of € 13,661 M, according to the most recent e-commerce data available on the website. Factors of concern include ease of access, detailed information, privacy and security and reliability (Gutiérrez-Rodríguez et al., 2020), as well as e-trust and online skills (Fernández-Bonilla et al., 2022), among other things. The contribution made by this research is threefold. First, it addresses a gap in the recent academic literature by analysing the drivers and barriers to e-commerce adoption by integrating into the UTAUT2 model other related variables analysed in the scientific literature. In this sense, recent research has proposed different reviews of the importance of the UTAUT2 model (Taneja and Bharti, 2021, Tamilmani et al., 2021), concluding that it is one of the models most employed by the scientific literature in the study of technology adoption as well as in the use of new variables to improve its predictive capacity (Yawised et al., 2022, Kuriakose et al., 2022, Migliore et al., 2022). Secondly, although it is true that the adoption of e-commerce has been analysed on different occasions, this research is novel because of the comparative analysis between two countries that are very close and with very similar behaviour such as Spain and Portugal (Hofstede Insights, 2022). Thirdly, we contribute different findings for Spain and Portugal from the use of Hierarchical Tree-based Regression (HTBR) in the definition of the profiles of online shoppers and physical shopping in both countries independently and comparatively after the end of the COVID-19 pandemic.[3]

The high volume of money involved in e-commerce transactions draws the attention of fraudsters, which makes fraud prevention and detection techniques of high importance. Current surveys and reviews on fraud systems focus mainly on financial-specific domains or general areas, leaving e-commerce aside. In this context, this article presents a systematic literature review on fraud detection and prevention for e-commerce systems. Our methodology involved searching for articles published in the last six years into four different literature databases. The search of articles employs a search string composed of the following keywords: purchase, buy, transactions, fraud prevention, fraud detection, e-commerce, web commerce, online store, real-time, and stream. We apply six filtering criteria to remove irrelevant articles. The methodology resulted in 64 articles, which we carefully analysed to answer five research questions. Our contribution appears in the updated perception of fraud types, computational methods for fraud detection and prevention, as well as the employed domains. To the best of our knowledge, this is the first survey on combining prevention and detection of e-commerce frauds, linking also architectural insights, artificial intelligence methods, and open challenges and gaps in the research area. The study's main findings

demonstrate that from 64 articles, only five focus on the fraud prevention problem, and credit card fraud is the most explored fraud type. In addition, current literature lacks studies that propose strategies for detecting fraudsters and automated bots in real-time.[4]

In the late 1990's, the internet promoted the formation of e-commerce, and information technology's development in the intervening years has driven the rapid development of e-commerce over the past 20 years. For example, Web2.0 led to the emergence and development of the platform-based e-commerce model (Yu, 2019). Moreover, the emerging technologies— such as social media, cloud computing, big data, and artificial intelligence (AI)—have also scaled up e-commerce development (Ilmudeen, 2021). e-Commerce has been driven by these technologies' rapid advancement, which might also have steered the evolution of research themes in this field.

Prior studies have applied various methods to understand research in the e-commerce field. For instance, Ngai and Wat (2002) presented a literature review and classification scheme for e-commerce research based on 275 journal articles published between 1993 and 1999 in nine e-commerce–related journals. They found exponential growth in research on the applications, technological issues, support and implementation, and other categories in the e-commerce field. Wareham et al. (2005) studied 582 academic articles pertaining to e-commerce that had been published in academic journals between 1997 and 2003. With a meta-analysis method, they found that business-to-business (B2B), strategy, business-to-consumer (B2C), trust, and technology adoption were popular research topics in this field. Moreover, they found that survey was a dominant research method in the e-commerce field during the studied period. Their findings indicated great diversity in e-commerce research topics due to the field's interdisciplinary nature. Wareham et al. also pointed out that research topics in this field should have been developed alongside new technologies continuously applied to the e-commerce domain, providing a general understanding of e-commerce as an important research area in information systems (IS), management information systems (MIS) and international business research.[5]

This research quantifies how privacy concerns and consumer characteristics are associated with e-commerce participation and consumer response to social media advertising by accounting for both individual-level and country-level covariates. This study uniquely analyses a rich micro-level data set that includes responses of 153,053 individuals from 29 European countries. Through multilevel logit modelling, authors account for the country's nested structure of consumer behaviour and report odds ratios for relations between privacy measures and e-commerce activities of consumers in Europe. Privacy risk knowledge and online information sharing levels are positively correlated with probability of e-commerce participation. Odds of e-commerce participation are negatively associated with level of concern on online activity recordings. Consumers who take more protective actions against online privacy risks are more likely to participate in e-commerce and make purchases in response to social media advertisements. Firms that offer credible tools to help consumers protect their online privacy can benefit from increased e-commerce participation and higher effectiveness in social media advertising. Representative sampling in data collection offers external validity and generalizability of findings to the European market, which is unique for this study and an empirical contribution.[6]

With an increasing number of platform retailers introducing e-commerce brands (EBs), national brands (NBs) manufacturers choose to open self-operating channels as anti-entry tools for fighting

against EB introduction. Motivated by this observation, we investigate the interaction and timing of firms' e-commerce brand introduction and self-operating channel opening in a coopetitive supply chain with a platform retailer and an NB manufacturer, who is the platform retailer's upstream cooperator and downstream competitor. Using game theory, we give and analyse the equilibrium results of six different scenarios, which characterise the platform retailer's strategies about whether and which quality of EB should be introduced and the manufacturer's strategies about whether to open the self-operating channel. Our results show that when the platform retailer is a first-mover, his optimal EB introduction strategy depends on the platform fee, consumers' self-operating channel preferences, the NB's quality, and the manufacturer's self-operating strategy. When the manufacturer is a first-mover, the platform retailer is best to introduce a higher-quality EB irrespective of the manufacturer's self-operating strategy. Furthermore, the manufacturer prefers the platform retailer to concentrate on her NB's sale rather than introduce an EB in most cases, and the self-operating channel as an anti-entry approach to the platform retailer's EB introduction is effective in some scenarios.[7]

The rise of e-commerce today has allowed retailers to connect with potential customers in entirely new ways, and a downgrade in the importance of physical shops seems inevitable. Dense collections of academic studies have highlighted how e-commerce impacts consumer behaviours and retail services, but few studies have focused on the change in shop prices or shop rents. E-commerce substitutes offline consumption with online consumption. Dropping shop income may then reduce the shops' reliance on location and spur lower rents. If shop managers also provide online services, increasing management costs could even lower the shop's willingness to pay high rent. Online consumption could also change the value of agglomeration externalities and shop convenience – since people must still rely on offline shops for daily goods provision and catering services, the agglomerated externality of daily services and catering services might increase. And the importance of the shopping environment could be reduced as well since the investment in décor would hardly attract more visitors. Are all these deductions true? What would be the impacts on the shop rents? Such questions have seldom been discussed in real estate studies. The changes in shop prices or shop rents are regarded as a by-product of the market rebalance in response to the consumer behaviour changes. Yet depicting the changes and understanding the logic behind them remain important for both individual decision-making and urban management.[8]

It is always a challenge to predict the customers on the verge of churn accurately in e-commerce due to the complexity of features and dynamicity of data and develop effective churn prediction models to predict potential churners accurately. This paper presents an in-depth comparison between four machine learning techniques namely neural network, support vector machine, Naïve Bayes and random forest, and Adam deep learning technique, for predicting customer churn in e-commerce. The classification techniques are implemented on a benchmarked Brazilian e-commerce dataset. For the feature selection, principal component analysis and neighbourhood component analysis techniques have been used. A balanced dataset, consisting of 11224 samples, is taken for study. The performance of the developed models is evaluated using the performance metrics viz. accuracy, sensitivity, specificity, true positive value, and true negative value. It has been found that the random forest classifier for the features selected using the neighbourhood component analysis technique gives the highest prediction accuracy of 99.35% in comparison to classifiers used in this work as well as classifiers used by previous researchers. Additionally, the

accuracy of the classifiers for features selected using the neighbourhood component analysis technique is higher as compared to the principal component analysis technique. In future, authors are working further to improve the performance of the developed model by incorporating more features as well as evaluation parameters and proposing new models using convolutional neural networks. The authors also intend to use more than one dataset for the training of the models in the future.[9]

This research examines the influence of information sharing amongst consumers on e-commerce platforms. On this basis, we develop a model for predicting consumers' purchase decisions on social commerce platforms. We use PLS-SEM to analyse online and paper surveys from 310 consumers. The findings suggest that social commerce information sharing increases consumer perceptions of familiarity, perceived ease of use, and perceived usefulness of social commerce platforms. Consumer learning and training of social commerce systems also increased their stated intention to purchase using the platform. We theorise the rise of the hyper-informed consumer that conducts pre-purchase product and shopping platform research to improve purchasing outcomes and as a form of socialising. The authors explain the theoretical contributions and practical implications at the end of the paper.[10]

M-commerce has the potential to change consumers’ shopping habits and establish itself as a significant commerce channel. People rely on digital devices more than ever before, and the growth in M-commerce predicts that mobile will become the preferred channel for online shopping soon. This study is aimed at examining the effect of personal factors, economic factors, ease of doing factors, and safety-related factors due to Covid-19 on the adoption and use of M-commerce services among customers in Saudi Arabia. The study is empirical and is based on survey responses from 340, M-commerce customers in Saudi Arabia. The questionnaire method was used to collect the data. ANOVA and bivariate regression analysis were used to evaluate the collected data. The results showed that four independent variables, namely, personal, economic, ease of doing, and safety factors during the Covid-19 pandemic, are significant predictors of the dependent variable, adoption and use of M-commerce services by the customers. These factors influence customers’ purchasing decisions when they use M-commerce services. The study also concluded that the frequency of using M-commerce has increased during the Covid-19 pandemic because of health, safety, and social distancing guidelines. One of the main limitations of the study is the few selective constructs for the research. The finding of the study will be beneficial to the customers to understand the significance of M-commerce services, especially during pandemic situations.[11]

Online retail channels increasingly shape consumers’ purchase behaviour: we access a diversity of product types through web-shops; employ both smartphones and digital screens in stores; navigate the retail space by browsing online; and order pantry items, fresh groceries as well as prepared foods to be delivered at our doorsteps. The profound impact of online retail on mobility in cities, where the concentration of consumers resides, is, therefore, an extensively investigated and growing topic of interest in research. In the field of urban logistics, studies that evaluate the various impacts of e-commerce or propose efficiency or sustainability-enhancing applications are plentiful. Regardless, the general lack of solid urban e-commerce logistics data is supported widely. In this study, we systematically review the literature to identify and compare the types of e-commerce data that are currently known, employed and disclosed in urban logistics research as

well as the data sources that provide access to them. Within the set of identified data, knowledge concentrates on consumer preferences and number of deliveries related to e-commerce. However, our findings confirm the general data paucity, specifically on delivery trip-related information such as deliveries per trip, number of delivery rounds and vehicle specificities. Discrepancies are found in methodologies to collect and compile data, as well as data units used (e.g., orders, parcels, deliveries) that cause large variations in information possibly diverging from reality. The study contributes to current literature and practice by compiling and analysing currently available data on urban e-commerce logistics and by presenting recommendations and best practices for future enhancements in this research field. Based on the systematic literature review, we propose a common data agenda for urban e-commerce logistics research, focused on addressing data gaps and topics that are under-developed and undeveloped; pursuing data collection standardisation; disclosing data collection methodologies and sources; and specifying temporal and spatial information as well as units of data. Some data methodologies and sources can be recommended for future research: using interviews to collect quantitative data; collaborating with sector organisations; exploring open maps; employing existing household and time use surveys; and leveraging technological opportunities and new ways of collecting data.[12]

As an emerging technology, flexible sensing can meet the requirements of small packaging, high stability, and complex working environments, which is considered for micro-environment monitoring(Xiao et al., 2022; Zhang et al., 2022). Meanwhile, flexible material can ensure the integrity of the packaging, avoid quality deterioration and environmental fluctuations caused by packaging damage (Rahman & Chowdhury, 2022). Additionally, as an artificial intelligence (AI) optimization method, machine learning can mine implicit laws from historical data, and make decision-making support for unknown factors (Sun et al., 2020). Based on decision-making knowledge by HACCP and massive data processed by AI, the difficulties with the exponential growth of data and the increase of model complexity can be effectively solved and optimised. Then the evaluated results are used to maintain internal micro-environmental stability and reduce quality loss, and economic characteristics should be fully considered during packaging practices, which provide a theoretical basis for packaging performance optimization (Amaral et al., 2015; Escursell et al., 2021). Ultimately, through a specific combination of effective packaging methods and strict temperature control, etc., the impact of DMFs on sustainable loss reduction was evaluated and the optimal control method was selected by packaging performance optimization.

To effectively improve the packaged lamb loss reduction in e-commerce supply chain, this paper comprehensively considered the dynamic correlation between lamb loss reduction and micro-environmental, quality, and economic factors in e-commerce based on HACCP, and obtained micro-environmental information through flexible sensing with the Internet of Things (IoT), quality results in laboratory, and economic analysis through collaborative research. After analysing the importance and influence weight of each indicator on final packaging performance, the FS-PPOS could realise sustainable packaging performance evaluation and dynamic results grading as the supply chain process proceeded. Simultaneously, the continuous improvement of loss reduction, systematic optimization, and applicability in other fields were also discussed.[13]

As mobile commerce (m-commerce) plays an increasingly significant role in retailing, opportunities exist for organisations to shape or reshape their reputations. Therefore, it is important to understand the mechanism through which organisational reputation is shaped and

perceived by customers through m-commerce. This study addresses whether organisational efforts in m-commerce are linked to reputation through mobile service quality, perceived value, and customer satisfaction using the cues-images-impressions model. Using an online survey with 744 valid responses (440 physical product shopping and 304 virtual product shopping), the results show that perceived m-commerce effort affects mobile service quality. In addition, the relationship among mobile service quality, value, and satisfaction, which was previously proposed in the literature and tested in various contexts, is confirmed. Finally, impressions are a result of mobile service quality, value, and satisfaction. This study contributes knowledge on the organisational reputation formation in m-commerce research.[14]

The development of information and communication technologies in recent years has had a huge impact on the interaction between companies and customers. Internet technologies and mobile communication are becoming increasingly important. This development brought about such concepts as e-commerce and, more broadly, e-business. The aim of the article is to show the impact of the development of communications infrastructure, in particular the availability and bandwidth of the Internet, on the development of e-commerce.[15]

CHAPTER 3

FEASIBILITY STUDY

A feasibility analysis is used to determine the viability of an idea, such as ensuring a project is legally and technically feasible as well as economically justifiable. It tells us whether a project is worth the investment—in some cases, a project may not be doable. There can be many reasons for this, including requiring too many resources, which not only prevents those resources from performing other tasks but also may cost more than an organization would earn back by taking on a project that isn't profitable.
A well-designed study should offer a historical background of the business or project, such as a description of the product or service, accounting statements, details of operations and management, marketing research and policies, financial data, legal requirements, and tax obligations. Generally, such studies precede technical development and project implementation.

3.1 TECHNICAL FEASIBILITY

This assessment focuses on the technical resources available to the organization. It helps organizations determine whether the technical resources meet capacity and whether the technical team can convert the ideas into working systems. Technical feasibility also involves the evaluation of the hardware, software, and other technical requirements of the proposed system. It includes finding out technologies for the project, both hardware and software. For a virtual assistant, the user must have a microphone to convey their message and a speaker to listen when the system speaks. These are very cheap nowadays and everyone generallypossesses them. Besides, the system needs an internet connection. While using the assistant, make sure you have a steady internet connection. It is also not an issue in this era where almost every home oroffice has Wi-Fi.

3.2 OPERATIONAL FEASIBILITY

This assessment involves undertaking a study to analyze and determine whether—and how well—the organization's needs can be met by completing the project. Operational feasibility studies also examine how a project plan satisfies the requirements identified in the requirements analysis phase of system development. It is the ease and simplicity of operation of the proposed system. The system does not require any special skill set for users to operate it. This shows the management and organizational structure of the project. This project is not built by a team. The management tasks are all to be carried out by a single person. That won't create any management issues and will increase the feasibility of the project.

3.3 ECONOMICAL FEASIBILITY

In the Economic Feasibility study cost and benefit of the project are analyzed. This means under this feasibility study a detailed analysis is carried out will be the cost of the project for development which includes all required costs final development hardware and software resources required, design and development costs and operational costs, and so on.
After that, it is analyzed whether the project will be beneficial in terms of finance for the organization or not. we find the total cost and benefit of the proposed system over the current system. For this project, the main cost is the documentation cost. Users also would have to pay for the microphone and speakers. Again, they are cheap and available. As far as maintenance is concerned, Assistant won't cost too much.

3.4 BEHAVIOURAL FEASIBILITY

It evaluates and estimates the user attitude or behavior toward the development of the new system. It helps in determining if the system requires special effort to educate, retrain, transfer, and change an employee's job status on new ways of conducting business. Establishing the cost-effectiveness of the proposed system i.e. if the benefits do not outweigh the costs then it is not worth going ahead. In the fast-paced world today there is a great need for online social networking facilities. Thus the benefits of this project in the current scenario make it economically feasible. The purpose of the economic feasibility assessment is to determine the positive economic benefits to the organization that the proposed system will provide. It includes quantification and identification of all the benefits expected. This assessment typically involves a cost/benefits analysis.

CHAPTER 4

DATABASE DESIGN

A properly designed database provides you with access to up-to-date, accurate information. Because a correct design is essential to achieving your goals in working with a database, investing the time required to learn the principles of good design makes sense. In the end, you are much more likely to end up with a database that meets your needs and can easily accommodate change. This article provides guidelines for planning a desktop database. You will learn how to decide what information you need, how to divide that information into the appropriate tables and columns, and how those tables relate to each other. You should read this article before you create your first desktop database.

Database design can be generally defined as a collection of tasks or processes that enhance the designing, development, implementation, and maintenance of an enterprise data management system. Designing a proper database reduces the maintenance cost thereby improving data consistency and the cost-effective measures are greatly influenced in terms of disk storage space. Therefore, there has to be a brilliant concept for designing a database. The designer should follow the constraints and decide how the elements correlate and what kind of data must be stored.

The main objectives behind database designing are to produce physical and logical design models of the proposed database system. To elaborate on this, the logical model is primarily concentrated on the requirements of data and the considerations must be made in terms of monolithic considerations hence the stored physical data must be stored independent of the physical conditions. On the other hand, the physical database design model includes a translation of the logical design model of the database by keeping control of physical media using hardware resources and software systems such as Database Management System (DBMS).

4.1 FLOW CHART

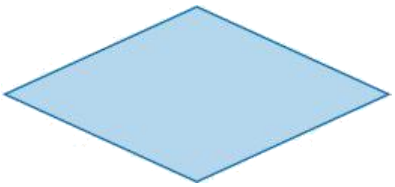
A flowchart is a graphical representation of an algorithm. Programmers often use it as a program-planning tool to solve a problem. It makes use of symbols that are connected among them to indicate the flow of information and processing.
The process of drawing a flowchart for an algorithm is known as “flowcharting”.
Basic Symbols used in Flowchart Designs

Terminal: The oval symbol indicates Start, Stop, and Halt in a program’s logic flow. A pause/halt is generally used in a program logic under some error conditions. The terminal is the first and last symbol in the flowchart.

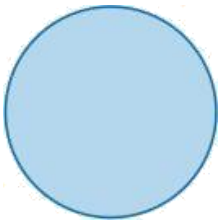
Input/Output: A parallelogram denotes any function of input/output type. Program instructions that take input from input devices and display output on output devices are indicated with parallelograms in a flowchart.

Processing: A box represents arithmetic instructions. All arithmetic processes such as adding, subtracting, multiplication, and division are indicated by action or process symbol.

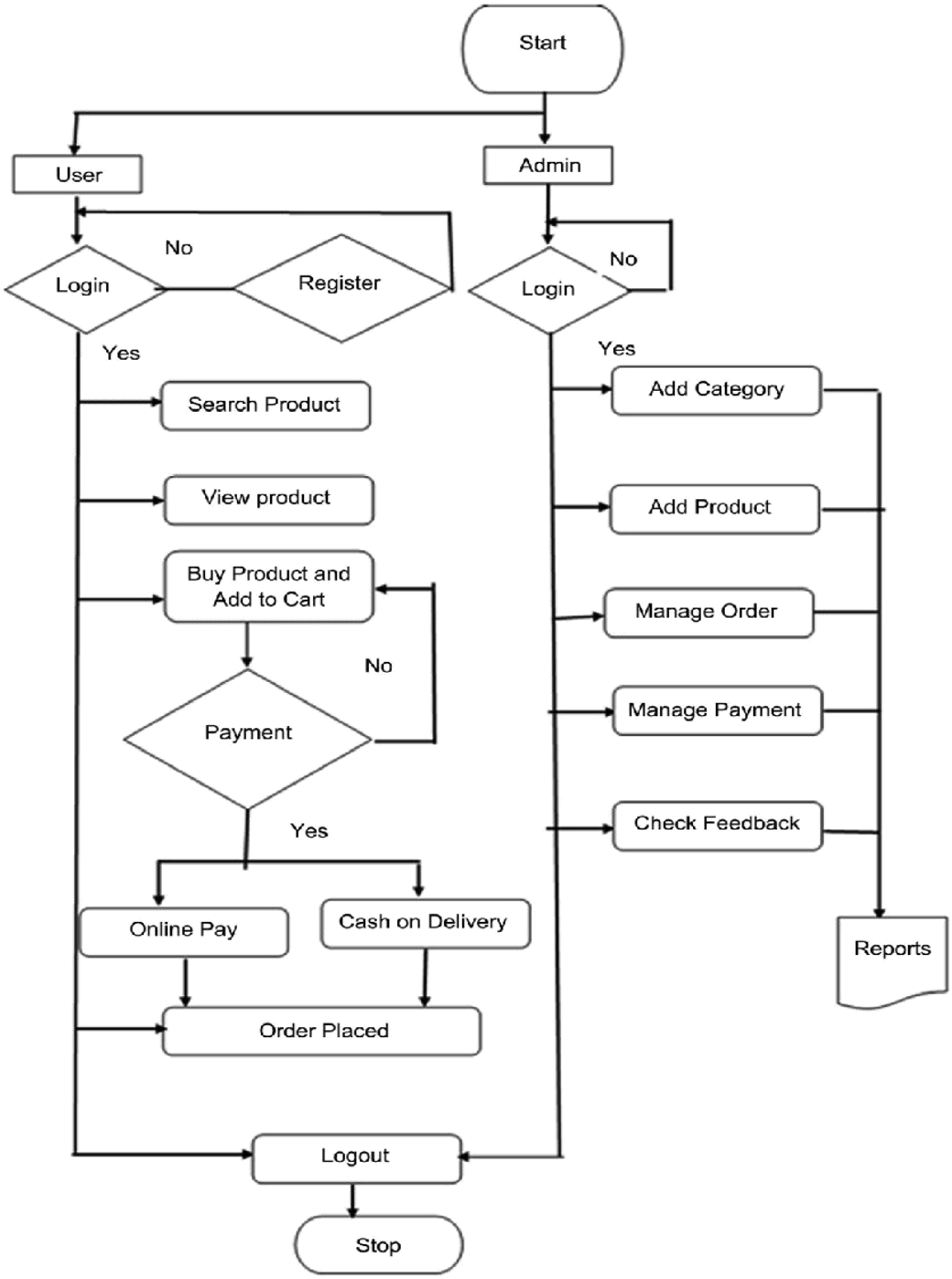
Decision Diamond symbol represents a decision point. Decision-based operations such as yes/no questions or true/false are indicated by diamonds in the flowchart.



Connectors: Whenever the flowchart becomes complex or it spreads over more than one page, it is useful to use connectors to avoid any confusions. It is represented by a circle.



Flow lines: Flow lines indicate the exact sequence in which instructions are executed. Arrows represent the direction of the flow of control and the relationship among different symbols of the flowchart.



4.2 USE CASE DIAGRAM

A use case diagram is a graphical depiction of a user's possible interactions with a system. A use case diagram shows various use cases and different types of users the system has and will often be accompanied by other types of diagrams as well. The use cases are represented by either circles or ellipses. The actors are often shown as stick figures.

The purpose of a use case diagram is to capture the dynamic aspect of a system. However, this definition is too generic to describe the purpose, as the other four diagrams (activity, sequence, collaboration, and State chart) also have the same purpose. We will look into some specific purpose, which will distinguish it from the other four diagrams.

Use case diagrams are used to gather the requirements of a system including internal and external influences. These requirements are mostly design requirements. Hence, when a system is analyzed to gather its functionalities, use cases are prepared and actors are identified.
When the initial task is complete, use case diagrams are modeled to present the outside view.

In brief, the purposes of use case diagrams can be said to be as follows −

Used to gather the requirements of a system.

Used to get an outside view of a system.

Identify the external and internal factors influencing the system.

Show the interaction among the requirements actors.

Use case diagram components.

To answer the question, "What is a use case diagram?" you need to first understand its building blocks. Common components include:

Actors: The users that interact with a system. An actor can be a person, an organization, or an outside system that interacts with your application or system. They must be external objects that produce or consume data.

System: A specific sequence of actions and interactions between actors and the system. A system may also be referred to as a scenario.

Goals: The end result of most use cases. A successful diagram should describe the activities and variants used to reach the goal.

Use case diagram symbols and notation.

The notation for a use case diagram is pretty straight forward and doesn't involve as many types of symbols as other UML diagrams.

Use cases: Horizontally shaped ovals that represent the different uses that a user might have.

· **Actors:** Stick figures that represent the people actually employing the use cases.

· **Associations:** A line between actors and use cases. In complex diagrams, it is important to know which actors are associated with which use cases.

· **System boundary boxes:** A box that sets a system scope to use cases. All use cases outside the box would be considered outside the scope of that system. For example, Psycho Killer is outside the scope of occupations in the chainsaw example found below.

· **Packages:** A UML shape that allows you to put different elements into groups. Just as with component diagrams, these groupings are represented as file folders.

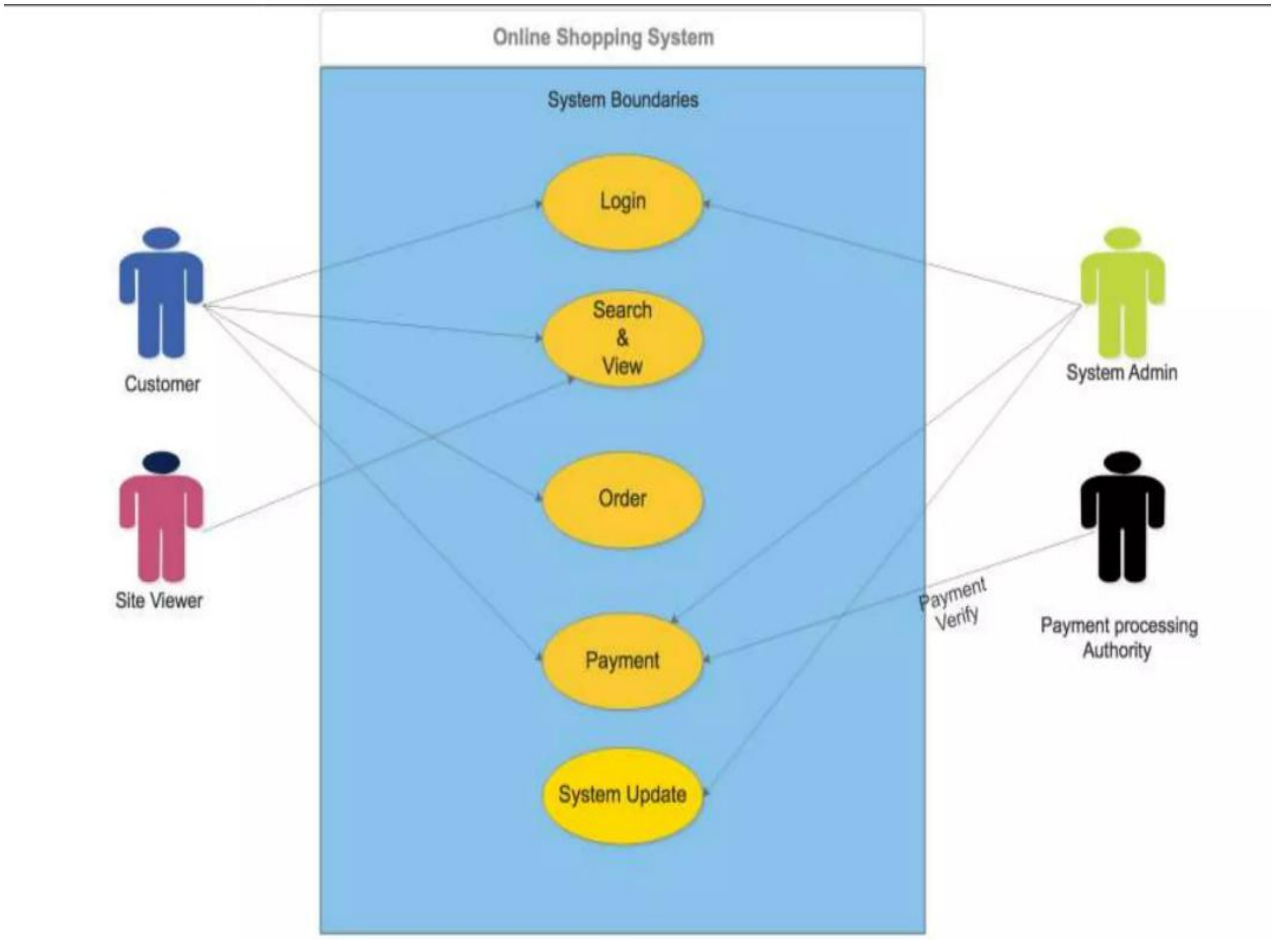


Fig 4.2: Use Case Diagram of Easy Buy

4.3 SEQUENCE DIAGRAM

A **sequence diagram** or **s**ystem sequence diagram (SSD) shows object interactions arranged in time sequence in the field of software engineering. It depicts the objects involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of scenario. Sequence diagrams are typically associated with use case realizations in the logical view of the system under development. Sequence diagrams are sometimes called event diagrams or event scenarios.

For a particular scenario of a use case, the diagrams show the events that external actors generate, their order, and possible inter-system events. All systems are treated as a black box; the diagram places emphasis on events that cross the system boundary from actors to systems. A system sequence diagram should be done for the main success scenario of the use case, and frequent or complex alternative scenarios.

To model high-level interaction among active objects within a system.

To model interaction among objects inside a collaboration realizing a use case.

It either models generic interactions or some certain instances of interaction.

Sequence Diagram Notations –

i. Actors – An actor in a UML diagram represents a type of role where it interacts with the system and its objects. It is important to note here that an actor is always outside the scope of the system we aim to model using the UML diagram

ii. Lifelines – A lifeline is a named element which depicts an individual participant in a sequence diagram. So basically each instance in a sequence diagram is represented by a lifeline. Lifeline elements are located at the top in a sequence diagram.

iii. Messages – Communication between objects is depicted using messages. The messages appear in a sequential order on the lifeline. We represent messages using arrows. Lifelines and messages form the core of a sequence diagram.

iv. Guards – To model conditions we use guards in UML. They are used when we need to restrict the flow of messages on the pretext of a condition being met. Guards play an important role in letting software developers know the constraints attached to a system or a particular process.

Uses of sequence diagrams –

i. Used to model and visualise the logic behind a sophisticated function, operation or procedure.

ii. They are also used to show details of UML use case diagrams.

iii. Used to understand the detailed functionality of current or future systems.

iv. Visualise how messages and tasks move between objects or components in a system.

For Task Execution:

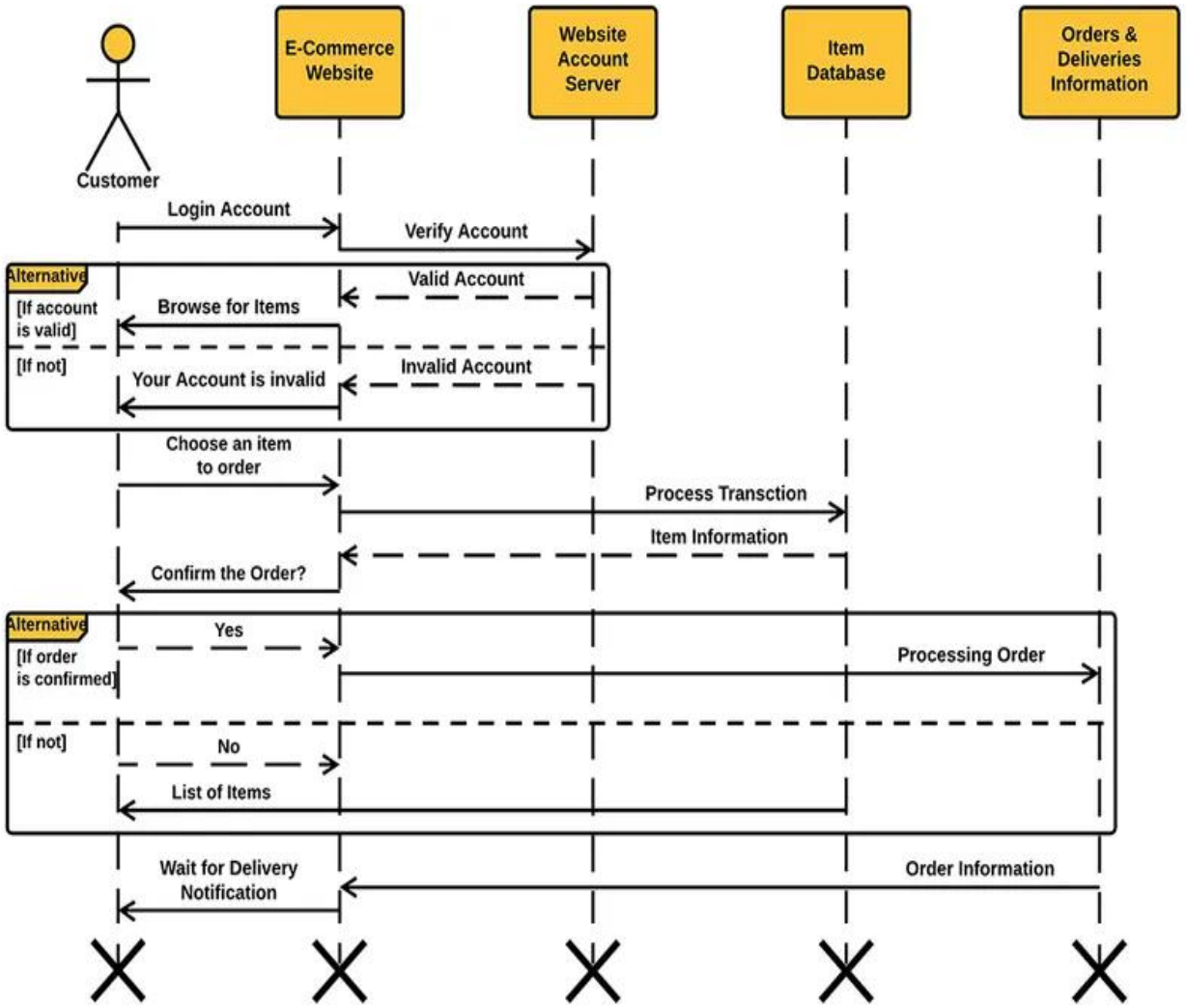


Fig 4.3 : Sequence Diagram for Easy Buy

4.4 ACTIVITY DIAGRAM

The activity diagram is used to demonstrate the flow of control within the system rather than the implementation. It models the concurrent and sequential activities.

The activity diagram helps in envisioning the workflow from one activity to another. It put emphasis on the condition of flow and the order in which it occurs. The flow can be sequential, branched, or concurrent, and to deal with such kinds of flows, the activity diagram has come up with a fork, join, etc.

It is also termed as an object-oriented flowchart. It encompasses activities composed of a set of actions or operations that are applied to model the behavioral diagram.

Components of an Activity Diagram

Following are the component of an activity diagram:

Activities

The categorization of behavior into one or more actions is termed as an activity. In other words, it can be said that an activity is a network of nodes that are connected by edges. The edges depict the flow of execution. It may contain action nodes, control nodes, or object nodes.

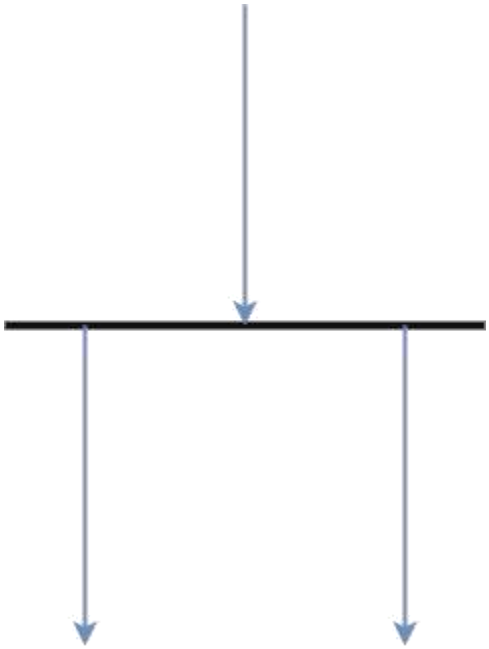
The control flow of activity is represented by control nodes and object nodes that illustrates the objects used within an activity. The activities are initiated at the initial node and are terminated at the final node.

Activity partition /swimlane

The swimlane is used to cluster all the related activities in one column or one row. It can be either vertical or horizontal. It used to add modularity to the activity diagram. It is not necessary to incorporate swimlane in the activity diagram. But it is used to add more transparency to the activity diagram.

Forks

Forks and join nodes generate the concurrent flow inside the activity. A fork node consists of one inward edge and several outward edges. It is the same as that of various decision parameters. Whenever a data is received at an inward edge, it gets copied and split crossways various outward edges. It split a single inward flow into multiple parallel flows.



Join Nodes

Join nodes are the opposite of fork nodes. A Logical AND operation is performed on all of the inward edges as it synchronizes the flow of input across one single output (outward) edge.

Pins

It is a small rectangle, which is attached to the action rectangle. It clears out all the messy and complicated thing to manage the execution flow of activities. It is an object node that precisely represents one input to or output from the action.

Notation of an Activity diagram

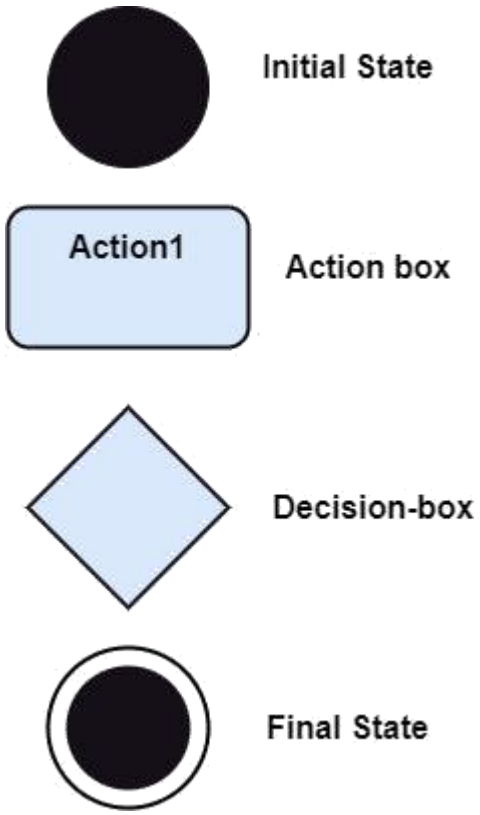
Activity diagram constitutes following notations:

Initial State: It depicts the initial stage or beginning of the set of actions.

Final State: It is the stage where all the control flows and object flows end.

Decision Box: It makes sure that the control flow or object flow will follow only one path.

Action Box: It represents the set of actions that are to be performed.



Why use Activity Diagram?

An event is created as an activity diagram encompassing a group of nodes associated with edges. To model the behavior of activities, they can be attached to any modeling element. It can model use cases, classes, interfaces, components, and collaborations.
It mainly models processes and workflows. It envisions the dynamic behavior of the system as well as constructs a runnable system that incorporates forward and reverse engineering. It does not include the message part, which means message flow is not represented in an activity diagram.

It is the same as that of a flowchart but not exactly a flowchart itself. It is used to depict the flow between several activities.

How to draw an Activity Diagram?

An activity diagram is a flowchart of activities, as it represents the workflow among various activities. They are identical to the flowcharts, but they themselves are not exactly the flowchart. In other words, it can be said that an activity diagram is an enhancement of the flowchart, which encompasses several unique skills.

Since it incorporates swim lanes, branching, parallel flows, join nodes, control nodes, and forks, it supports exception handling. A system must be explored as a whole before drawing an activity diagram to provide a clearer view of the user. All of the activities are explored after they are properly analyzed for finding out the constraints applied to the activities. Each and every activity, condition, and association must be recognized.

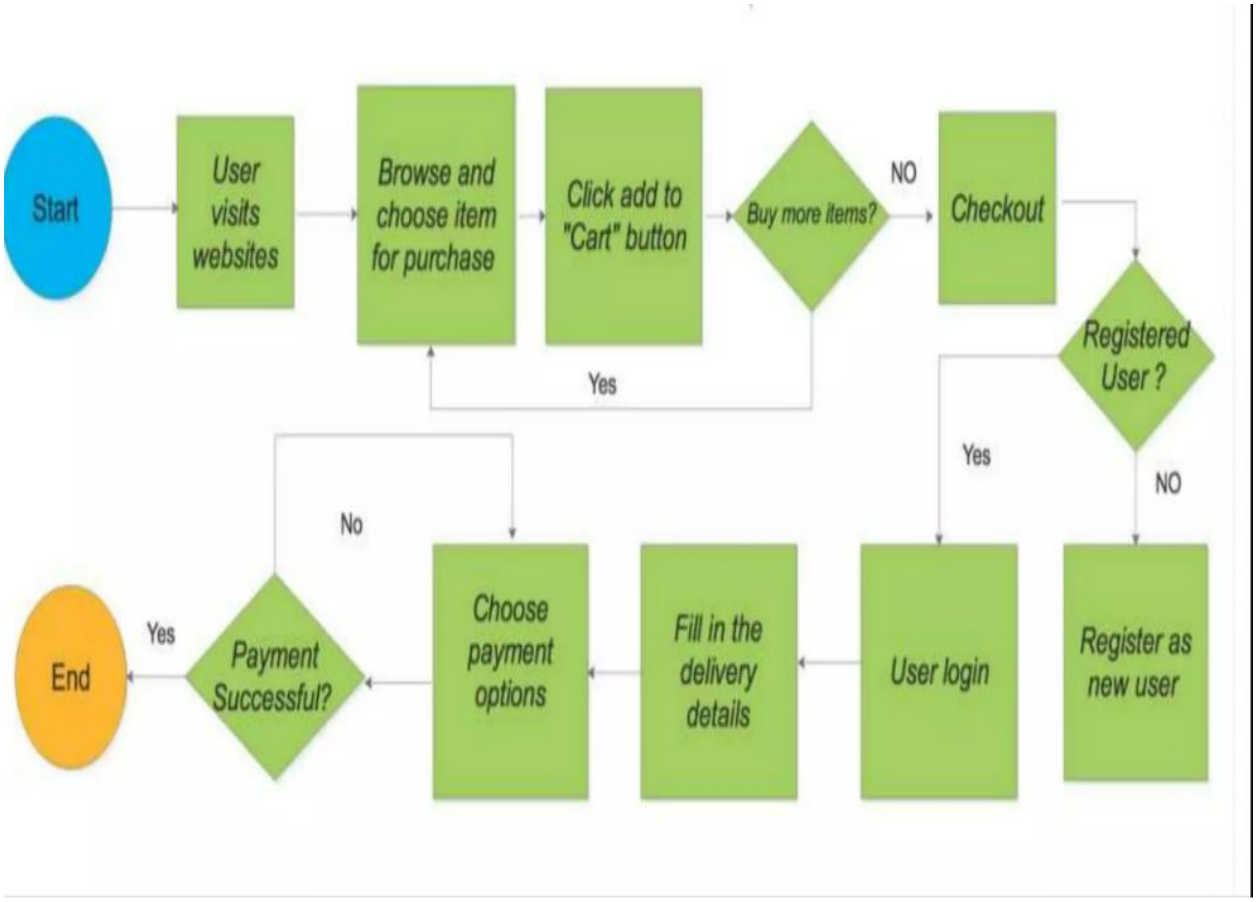
After gathering all the essential information, an abstract or a prototype is built, which is then transformed into the actual diagram.

Following are the rules that are to be followed for drawing an activity diagram:

A meaningful name should be given to each and every activity.

Identify all of the constraints.

Acknowledge the activity associations



4.5 CLASS DIAGRAM

The class diagram depicts a static view of an application. It represents the types of objects residing in the system and the relationships between them. A class consists of its objects, and also it may inherit from other classes. A class diagram is used to visualize, describe, document various different aspects of the system, and also construct executable software code.

It shows the attributes, classes, functions, and relationships to give an overview of the software system. It constitutes class names, attributes, and functions in a separate compartment that helps in software development. Since it is a collection of classes, interfaces, associations, collaborations, and constraints, it is termed as a structural diagram.

Purpose of Class Diagrams

The main purpose of class diagrams is to build a static view of an application. It is the only diagram that is widely used for construction, and it can be mapped with object-oriented languages. It is one of the most popular UML diagrams. Following are the purpose of class diagrams given below:
It analyses and designs a static view of an application.
It describes the major responsibilities of a system.
It is a base for component and deployment diagrams. It incorporates forward and reverse engineering

Benefits of Class Diagrams

1. It can represent the object model for complex systems.

2. It reduces the maintenance time by providing an overview of how an application is structured before coding.

3. It provides a general schematic of an application for better understanding.

4. It represents a detailed chart by highlighting the desired code, which is to be programmed.

5. It is helpful for the stakeholders and the developers.

How to draw a Class Diagram?

The class diagram is used most widely to construct software applications. It not only represents a static view of the system but also all the major aspects of an application. A collection of class diagrams as a whole represents a system.

Some key points that are needed to keep in mind while drawing a class diagram are given below:

1. To describe a complete aspect of the system, it is suggested to give a meaningful name to the class diagram.

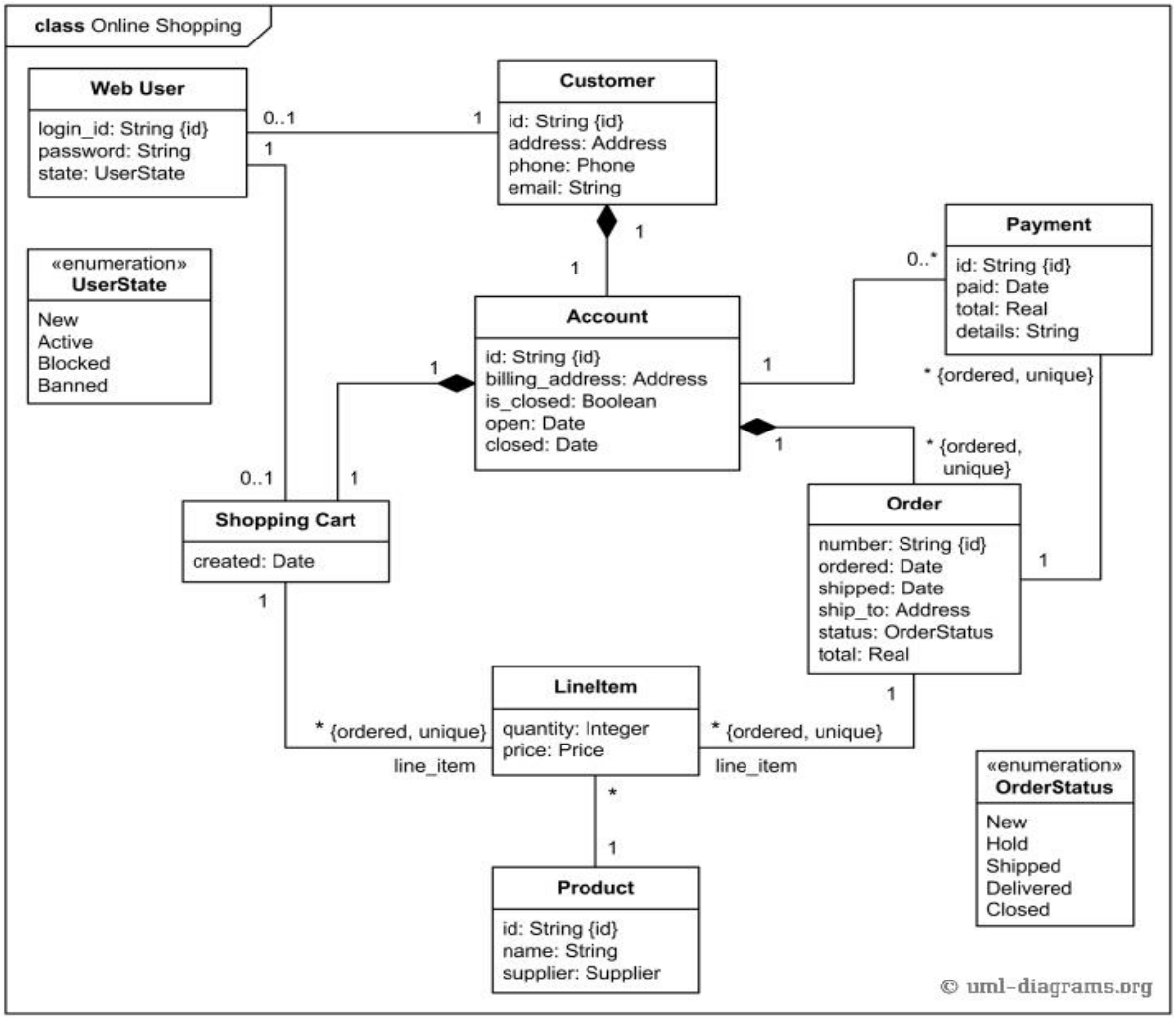
2. The objects and their relationships should be acknowledged in advance.

3. The attributes and methods (responsibilities) of each class must be known.

4. A minimum number of desired properties should be specified as more number of the unwanted property will lead to a complex diagram.

5. Notes can be used as and when required by the developer to describe the aspects of a diagram.

6. The diagrams should be redrawn and reworked as many times to make it correct before producing its final version.



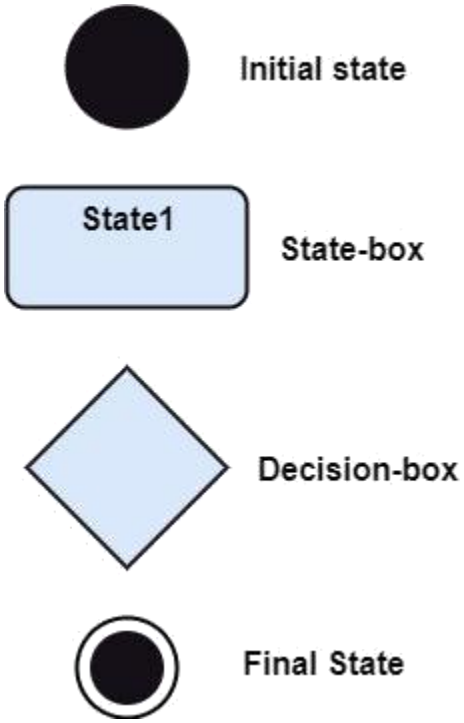
4.6 STATE DIAGRAM

The state machine diagram is also called the State chart or State Transition diagram, which shows the order of states underwent by an object within the system. It captures the software system's behavior. It models the behavior of a class, a subsystem, a package, and a complete system.

It tends out to be an efficient way of modeling the interactions and collaborations in the external entities and the system. It models event-based systems to handle the state of an object. It also defines several distinct states of a component within the system. Each object/component has a specific state.

Notation of a State Machine Diagram

Following are the notations of a state machine diagram enlisted below:



a. Initial state: It defines the initial state (beginning) of a system, and it is represented by a black filled circle.

b. Final state: It represents the final state (end) of a system. It is denoted by a filled circle present within a circle.

c. Decision box: It is of diamond shape that represents the decisions to be made on the basis of an evaluated guard.

d. Transition: A change of control from one state to another due to the occurrence of some event is termed as a transition. It is represented by an arrow labeled with an event due to which the change has ensued.

e. State box: It depicts the conditions or circumstances of a particular object of a class at a specific point of time. A rectangle with round corners is used to represent the state box.

How to Draw a State Machine Diagram?

The state machine diagram is used to portray various states underwent by an object. The change in one state to another is due to the occurrence of some event. All of the possible states of a particular component must be identified before drawing a state machine diagram.

The primary focus of the state machine diagram is to depict the states of a system. These states are essential while drawing a state transition diagram. The objects, states, and events due to which the state transition occurs must be acknowledged before the implementation of a state machine diagram.

Following are the steps that are to be incorporated while drawing a state machine diagram:

1. A unique and understandable name should be assigned to the state transition that describes the behavior of the system.

2. Out of multiple objects, only the essential objects are implemented.

3. A proper name should be given to the events and the transitions.

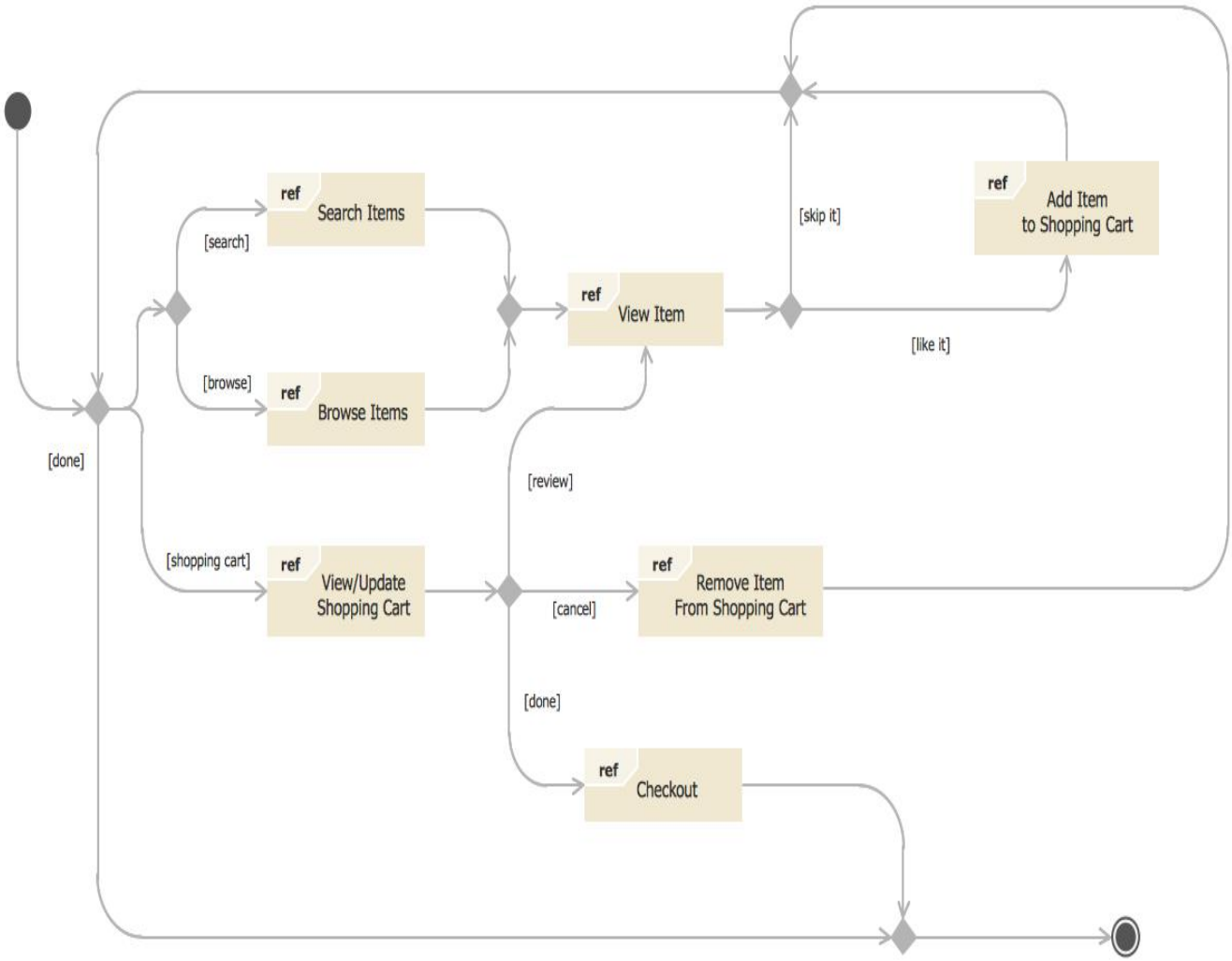


Fig 4.6 : State Chart Diagram of Easy Buy

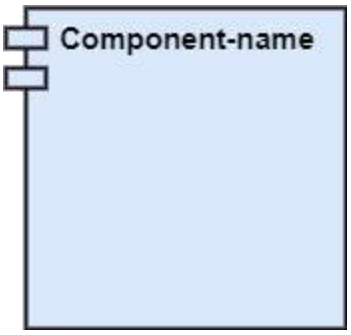
4.7 COMPONENT DIAGRAM

A component diagram is used to break down a large object-oriented system into the smaller components, so as to make them more manageable. It models the physical view of a system such as executables, files, libraries, etc. that resides within the node.

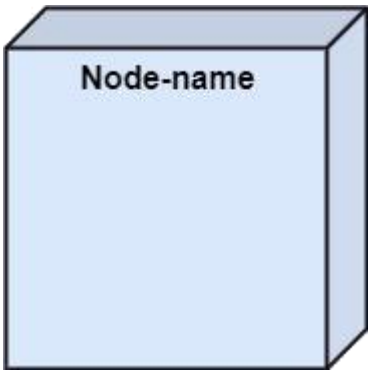
It visualizes the relationships as well as the organization between the components present in the system. It helps in forming an executable system. A component is a single unit of the system, which is replaceable and executable. The implementation details of a component are hidden, and it necessitates an interface to execute a function. It is like a black box whose behavior is explained by the provided and required interfaces.

Notation of a Component Diagram

a) A component



b) A node



How to Draw a Component Diagram?

The component diagram is helpful in representing the physical aspects of a system, which are files, executables, libraries, etc. The main purpose of a component diagram is different from that of other diagrams. It is utilized in the implementation phase of any application.

Once the system is designed employing different UML diagrams, and the artifacts are prepared, the component diagram is used to get an idea of implementation. It plays an essential role in implementing applications efficiently.

Following are some artifacts that are needed to be identified before drawing a component diagram:

1. What files are used inside the system?

2. What is the application of relevant libraries and artifacts?

3. What is the relationship between the artifacts?

Following are some points that are needed to be kept in mind after the artifacts are identified:

1. Using a meaningful name to ascertain the component for which the diagram is about to be drawn.

2. Before producing the required tools, a mental layout is to be made.

3. To clarify the important points, notes can be incorporated.

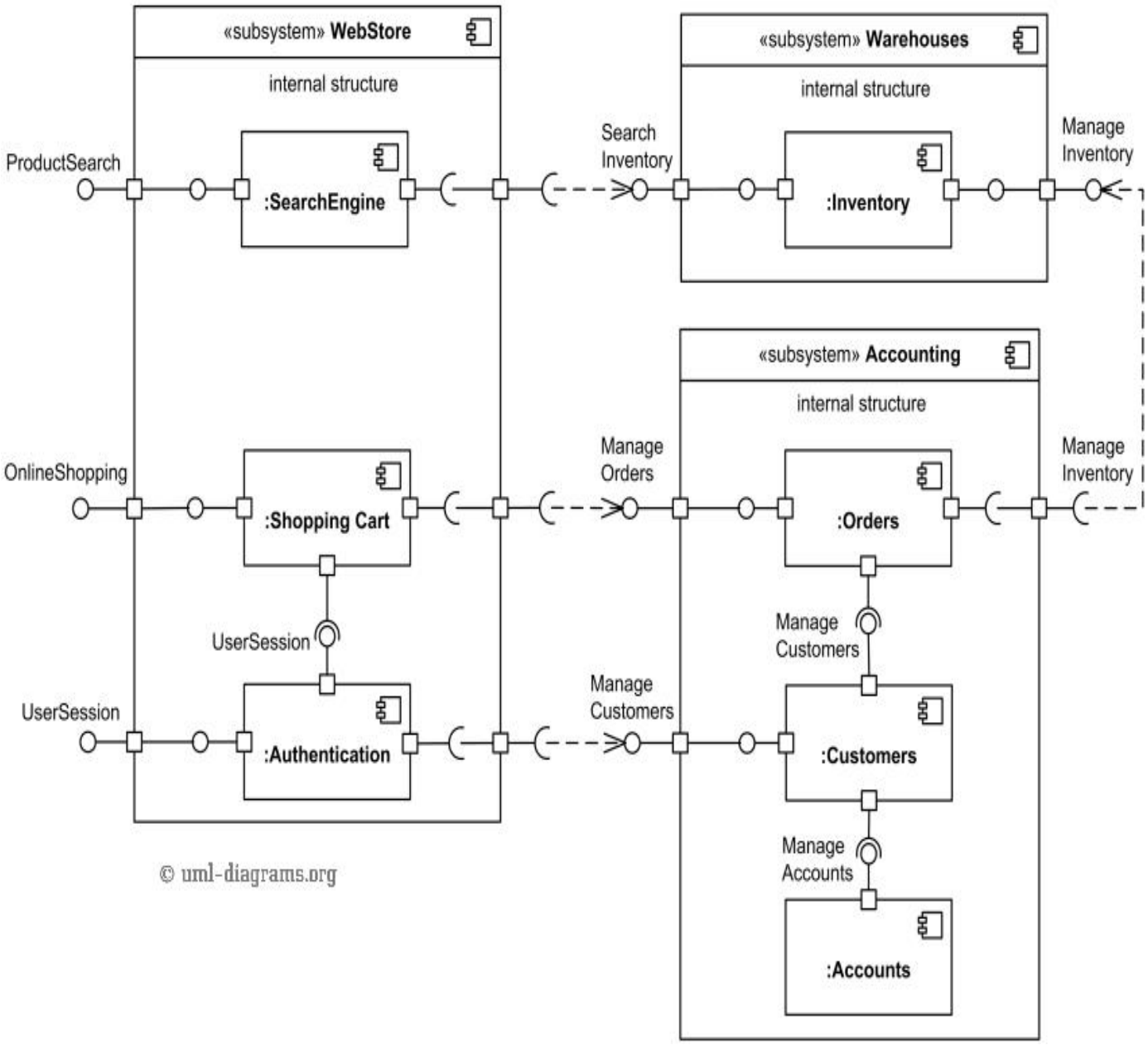


Fig 4.7 : Component Diagram of Easy Buy

CHAPTER 5

IMPLEMENTATION DETAILS

5.1 C#

C# is a general-purpose, modern and object-oriented programming language pronounced as “C sharp”. It was developed by Microsoft led by Anders Hejlsberg and his team within the .Net initiative and was approved by the European Computer Manufacturers Association (ECMA) and International Standards Organization (ISO). C# is among the languages for Common Language Infrastructure and the current version of C# is version 7.2. C# is a lot similar to Java syntactically and is easy for the users who have knowledge of C, C++ or Java.

5.2 DOT NET FRAMEWORK

The **.NET Framework** (pronounced as "*dot net*") is a proprietary software framework developed by Microsoft that runs primarily on Microsoft Windows. It was the predominant implementation of the Common Language Infrastructure (CLI) until being superseded by the cross-platform .NET project. It includes a large class library called Framework Class Library (FCL) and provides language interoperability (each language can use code written in other languages) across several programming languages. Programs written for .NET Framework execute in a software environment (in contrast to a hardware environment) named the Common Language Runtime (CLR). The CLR is an application virtual machine that provides services such as security, memory management, and exception handling. As such, computer code written using .NET Framework is called "managed code". FCL and CLR together constitute the .NET Framework.

FCL provides the user interface, data access, database connectivity, cryptography, web application development, numeric algorithms, and network communications. Programmers produce software by combining their source code with .NET Framework and other libraries. The framework is intended to be used by most new applications created for the Windows platform. Microsoft also produces an integrated development environment for .NET software called Visual Studio.

.NET Framework began as proprietary software, although the firm worked to standardize the software stack almost immediately, even before its first release. Despite the standardization efforts, developers, mainly those in the free and open-source software communities, expressed their unease with the selected terms and the prospects of any free and open-source implementation, especially regarding software patents. Since then, Microsoft has changed .NET development to more closely follow a contemporary model of a community-developed software project, including issuing an update to its patent promising to address the concerns.

5.3 ANGULAR

This topic can help you understand Angular: what Angular is, what advantages it provides, and what you might expect as you start to build your applications.
Angular is a development platform, built on TypeScript. As a platform, Angular includes:
A component-based framework for building scalable web applications
A collection of well-integrated libraries that cover a wide variety of features, including routing, forms management, client-server communication, and more
A suite of developer tools to help you develop, build, test, and update your code
With Angular, you're taking advantage of a platform that can scale from single-developer projects to enterprise-level applications. Angular is designed to make updating as straightforward as possible, so take advantage of the latest developments with minimal effort. Best of all, the Angular ecosystem consists of a diverse group of over 1.7 million developers, library authors, and content creators

5.4 Modules used in Easy Buy

5.4.1 User Interface

It is the First Page to be shown to the user as it is a single page website so the website is very dynamic, smooth and interactive with user and easy to understand.
The Interface will provide shoppers with information about the various products that are for sale. The information will include prices, product descriptions, stock availability as well as photographs of the products.
This will help user to purchase products.
.

5.4.2 Identity

This module if responsible for providing authorized access to the website.
If a user is already registered then they can use their credentials to login.

5.4.3 Pagination

Pagination is the method of separating digital content into different pages on a website. Users can navigate between these pages by clicking links, often in the form of numbers located at the bottom of a page.

5.4.4 Basket

This module is helpful for user to collect items from the website add them to an Basket .The Basket or Cart will contain all the products that are added by the user to collect so that it will be easy for user to purchase them together and proceed to checkout

5.4.5 Order

This page will display the information about the order and the total amount is calculated automatically.
User will be able to add or delete items and can view the items he/she have added to the basket.

5.4.6 Checkout

This module lets the user to place an order securely. It takes the user to login if he/she has not logged in and then the user is asked to add the shipping address. The user can also save it as default address and for the next time it will show this address automatically but if they want to change then they can.

CHAPTER 6

TESTING

6.1 UNIT TESTING

Unit testing involves the testing of each unit or an individual component of the software application. It is the first level of functional testing. The aim behind unit testing is to validate unit components with its performance.

A unit is a single testable part of a software system and tested during the development phase of the application software.

The purpose of unit testing is to test the correctness of isolated code. A unit component is an individual function or code of the application. White box testing approach used for unit testing and usually done by the developers.

Whenever the application is ready and given to the Test engineer, he/she will start checking every component of the module or module of the application independently or one by one, and this process is known as **Unit testing** or **components testing**.

Techniques of Unit Testing :-

6.1.1 White Box Testing

White box testing techniques analyze the internal structures the used data structures, internal design, code structure and the working of the software rather than just the functionality as in black box testing. It is also called glass box testing or clear box testing or structural testing.

6.1.2 Black Box Testing

Black box testing is a technique of software testing which examines the functionality of software without peering into its internal structure or coding. The primary source of black box testing is a specification of requirements that is stated by the customer.

6.1.3 Grey Box Testing

Grey box testing is a software testing method to test the software application with partial knowledge of the internal working structure. It is a **combination of black box and white box testing** because it involves access to internal coding to design test cases as white box testing and testing practices are done at functionality level as black box testing.

6.2 INTEGRATION TESTING

Integration testing is the second level of the software testing process comes after unit testing. In this testing, units or individual components of the software are tested in a group. The focus of the integration testing level is to expose defects at the time of interaction between integrated components or units.

Unit Testing uses modules for testing purpose, and these modules are combined and tested in integration testing. The Software is developed with a number of software modules that are coded by different coders or programmers. The goal of integration testing is to check the correctness of communication among all the modules.

Techniques of Integrating Testing :

6.2.1 Incremental Approach

In the Incremental Approach, modules are added in ascending order one by one or according to need. The selected modules must be logically related. Generally, two or more than two modules are added and tested to determine the correctness of functions. The process continues until the successful testing of all the modules.

6.2.2 Top-down Approach

The top-down testing strategy deals with the process in which higher level modules are tested with lower level modules until the successful completion of testing of all the modules. Major design flaws can be detected and fixed early because critical modules tested first. In this type of method, we will add the modules incrementally or one by one and check the data flow in the same order.

6.2.3 Bottom – Up Approach

The bottom to up testing strategy deals with the process in which lower level modules are tested with higher level modules until the successful completion of testing of all the modules. Top level critical modules are tested at last, so it may cause a defect. Or we can say that we will be adding the modules from **bottom to the top** and check the data flow in the same order.

6.2.4 Big Bang Approach

In this approach, testing is done via the integration of all modules at once. It is convenient for small software systems, if used for large software systems identification of defects is difficult. Since this testing can be done after completion of all modules due to that testing team has less time for execution of this process so that internally linked interfaces and high-risk critical modules can be missed easily.

6.3 SYSTEM TESTING

System Testing includes testing of a fully integrated software system. Generally, a computer system is made with the integration of software (any software is only a single element of a computer system). The software is developed in units and then interfaced with other software and hardware to create a complete computer system. In other words, a computer system consists of a group of software to perform the various tasks, but only software cannot perform the task; for that software must be interfaced with compatible hardware. System testing is a series of different type of tests with the purpose to exercise and examine the full working of an integrated software computer system against requirements.

To check the end-to-end flow of an application or the software as a user is known as **System testing**. In this, we navigate (go through) all the necessary modules of an application and check if the end features or the end business works fine, and test the product as a whole system.

It is **end-to-end testing** where the testing environment is similar to the production environment.

Types of System Testing:

6.3.1 Performance Testing:

Performance Testing is a type of software testing that is carried out to test the speed, scalability, stability and reliability of the software product or application.

6.3.2 Load Testing:

Load Testing is a type of software Testing which is carried out to determine the behavior of a system or software product under extreme load.

6.3.3 Stress Testing:

Stress Testing is a type of software testing performed to check the robustness of the system under the varying loads.

6.3.4 Scalability Testing:

Scalability Testing is a type of software testing which is carried out to check the performance of a software application or system in terms of its capability to scale up or scale down the number of user request load.

6.4 ACCEPTANCE TESTING

Acceptance testing is formal testing based on user requirements and function processing. It determines whether the software is conforming specified requirements and user requirements or not. It is conducted as a kind of Black Box testing where the number of required users involved testing the acceptance level of the system. It is the fourth and last level of software testing.

User acceptance testing (UAT) is a type of testing, which is done by the customer before accepting the final product. Generally, UAT is done by the customer (domain expert) for their satisfaction, and check whether the application is working according to given business scenarios, real-time scenarios.

In this, we concentrate only on those features and scenarios which are regularly used by the customer or mostly user scenarios for the business or those scenarios which are used daily by the end-user or the customer.

6.5 SOFTWARE VERIFICATION AND VALIDATION

6.5.1 Software Verification

Verification testing includes different activities such as business requirements, system requirements, design review, and code walkthrough while developing a product.
It is also known as static testing, where we are ensuring that "**we are developing the right product or not**". And it also checks that the developed application fulfilling all the requirements given by the client.
Verification is the process of checking that a software achieves its goal without any bugs. It is the process to ensure whether the product that is developed is right or not. It verifies whether the developed product fulfills the requirements that we have. Verification is **Static Testing**.

Activities involved in verification:

6.5.1.1 Inspections

6.5.1.2 Reviews

6.5.1.3 Walkthroughs

6.5.1.4 Desk-checking

6.5.2 Software Validation

Validation testing is testing where tester performed functional and non-functional testing.
Here **functional testing** includes Unit Testing (UT), Integration Testing (IT) and System Testing (ST), and **non-functional** testing includes User acceptance testing (UAT).

Validation testing is also known as dynamic testing, where we are ensuring that **"we have developed the product right."** And it also checks that the software meets the business needs of the client.

Validation is the process of checking whether the software product is up to the mark or in other words product has high level requirements. It is the process of checking the validation of product i.e. it checks what we are developing is the right product. it is validation of actual and expected product.
Validation is the **Dynamic Testing**.

Activities involved in validation:

6.5.2.1 Black box testing

6.5.2.2 White box testing

6.5.2.3 Unit testing

6.5.2.4 Integration testing

6.6 TEST PROCEDURE

A test procedure is a formal specification of test cases to be applied to one or more target program modules. Test procedures are executable. A process called the VERIFIER applies a test procedure to its target modules and produces an exception report indicating which test cases, if any, failed.
Test procedures facilitate thorough software testing by allowing individual modules or arbitrary groups of modules to be thoroughly tested outside the environment in which they will eventually reside. Test procedures are complete, self-contained, self-validating and execute automatically. Test procedures are a deliverable product of the software development process and are used for both initial checkout and subsequent regression testing of target program modifications.
Test procedures are coded in a new language called TPL (Test Procedure Language). The paper analyzes current testing practices, describes the structure and design of test procedures and introduces the Fortran Test Procedure Language.

6.7 TEST CASES

A test case is a document, which has a set of test data, preconditions, expected results and postconditions, developed for a particular test scenario in order to verify compliance against a specific requirement.

Test Case acts as the starting point for the test execution, and after applying a set of input values, the application has a definitive outcome and leaves the system at some end point or also known as execution postcondition.

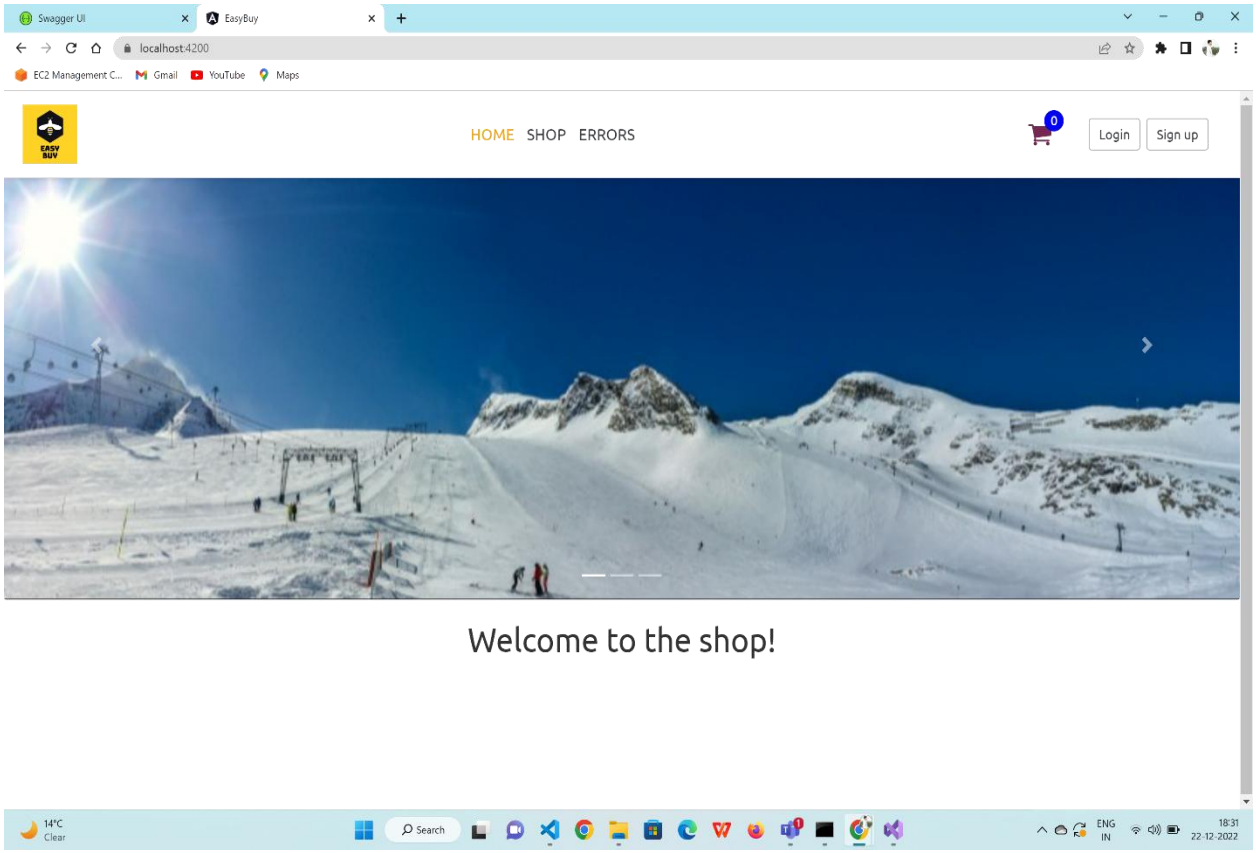
CHAPTER 7
DESIGN

Web design encompasses many different skills and disciplines in the production and maintenance of websites. The different areas of web design include web graphic design; user interface design (UI design); authoring, including standardised code and proprietary software; user experience design (UX design); and search engine optimization. Often many individuals will work in teams covering different aspects of the design process, although some designers will cover them all. The term "web design" is normally used to describe the design process relating to the front-end (client side) design of a website including writing markup. Web design partially overlaps web engineering in the broader scope of web development. Web designers are expected to have an awareness of usability and be up to date with web accessibility guidelines.

Here's why implementing these practices is important for your e-Commerce website:

- **To provide the best customer experience possible:** A great customer experience is about making it really simple for customers to buy products from your website, while also making it a great pleasure for them. These practices will help you create a website experience your customers will love.
- **To boost sales through conversion rate optimisation:** Great design will help you convert more website visitors into paying customers, boosting your sales and enhancing business performance.
- **To improve customer retention**: You don't want website visitors or existing customers to leave your website and buy the same product from someone else. A great design will help you grab the attention of your website visitors, and encourage your customers to be loyal towards your brand.
- **To reinforce your brand:** Great design will speak volumes about who you are, what your brand stands for, and help you be perceived appropriately. At the end of the day, design is about great communication!
- **To build customer relationships**: People tend to trust websites that are designed well, and therefore, will want to engage more with them. This helps with building great customer relationships with trust at its foundation.

7.1 HOME PAGE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EasyBuy
localhost:4200
EC2 Management C...
Gmail
YouTube
Maps
HOME
SHOP
ERRORS
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Login
Sign up
Welcome to the shop!
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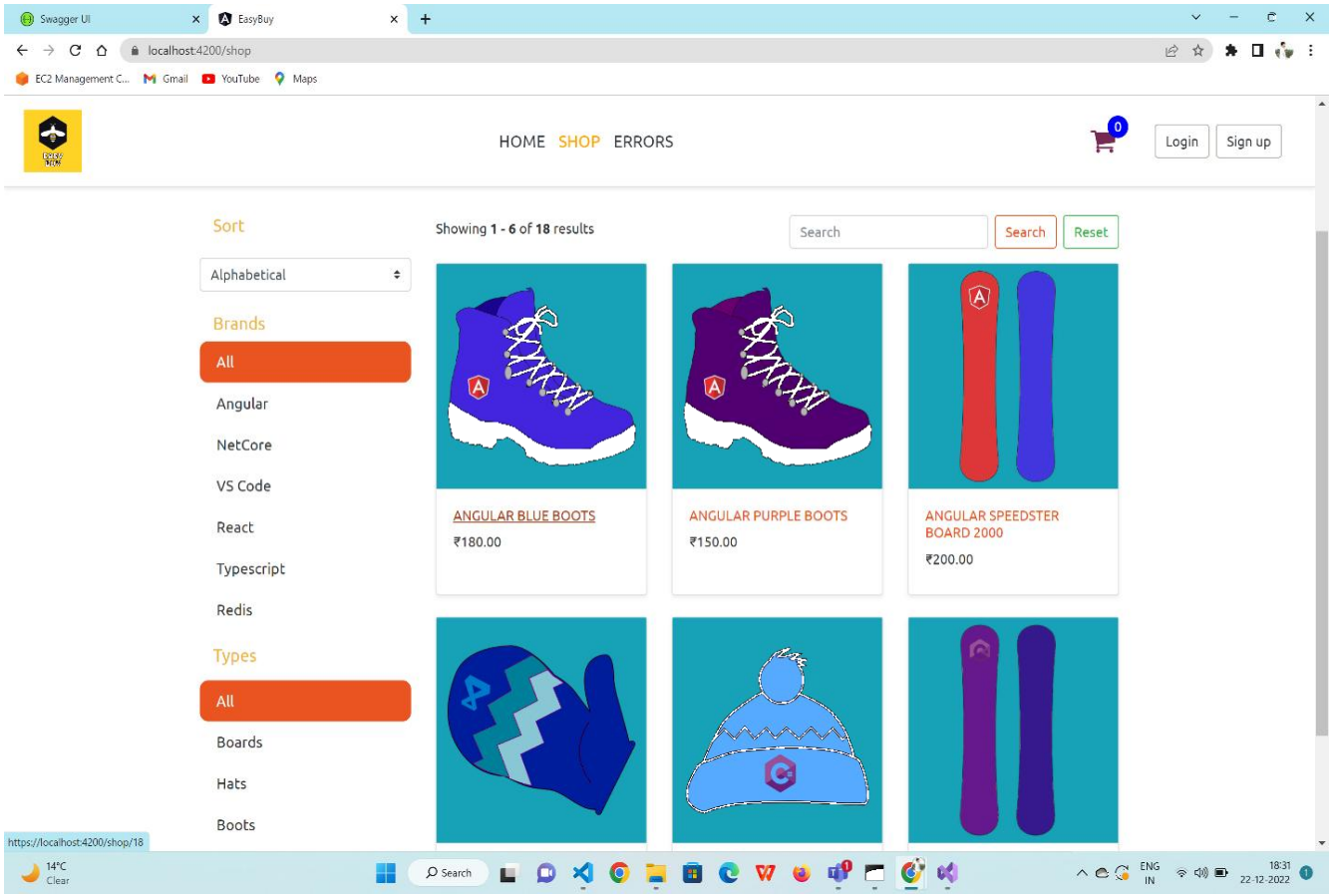
18:31
22-12-2022

7.2 SHOP


Swagger UI
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Sign up
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Brands
All
Angular
NetCore
VS Code
React
Typescript
Redis
Types
All
Boards
Hats
Boots
Showing 1 - 6 of 18 results
Search
Search
Reset
ANGULAR BLUE BOOTS
₹180.00
ANGULAR PURPLE BOOTS
₹150.00
ANGULAR SPEEDSTER BOARD 2000
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https://localhost:4200/shop/18
14°C
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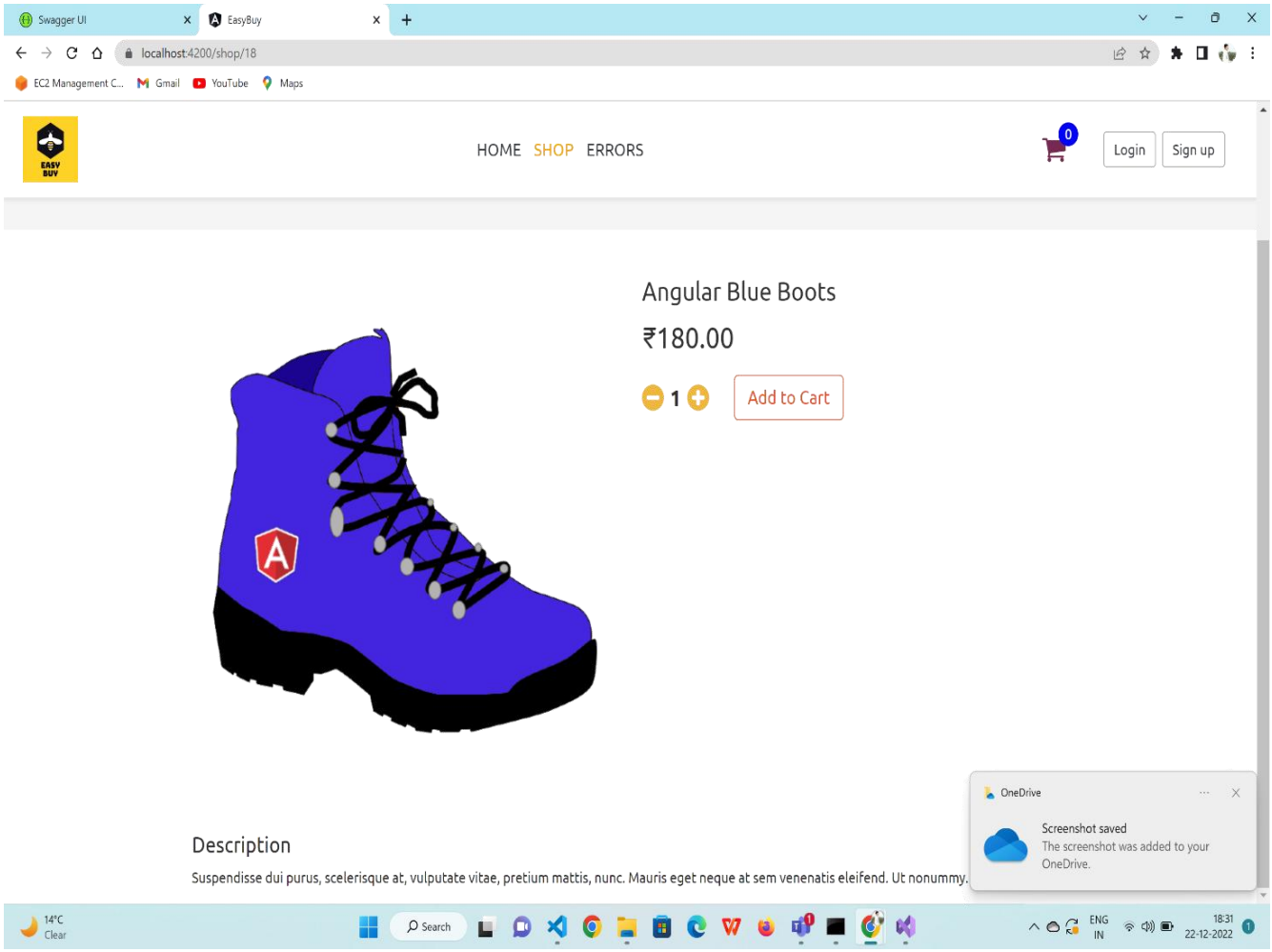
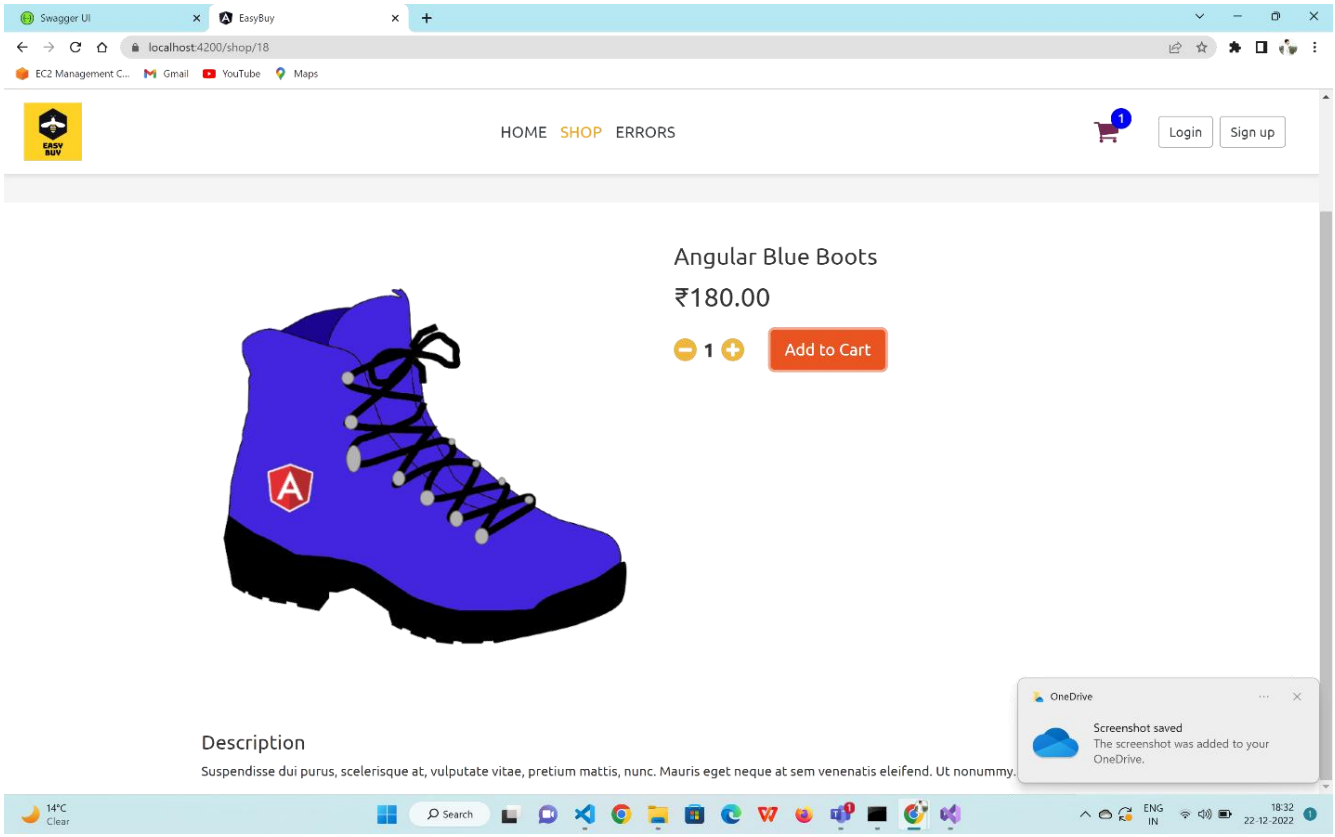
Search
ENG
IN
18:31
22-12-2022

7.3 VIEW PRODUCT



7.4 ADD TO CART



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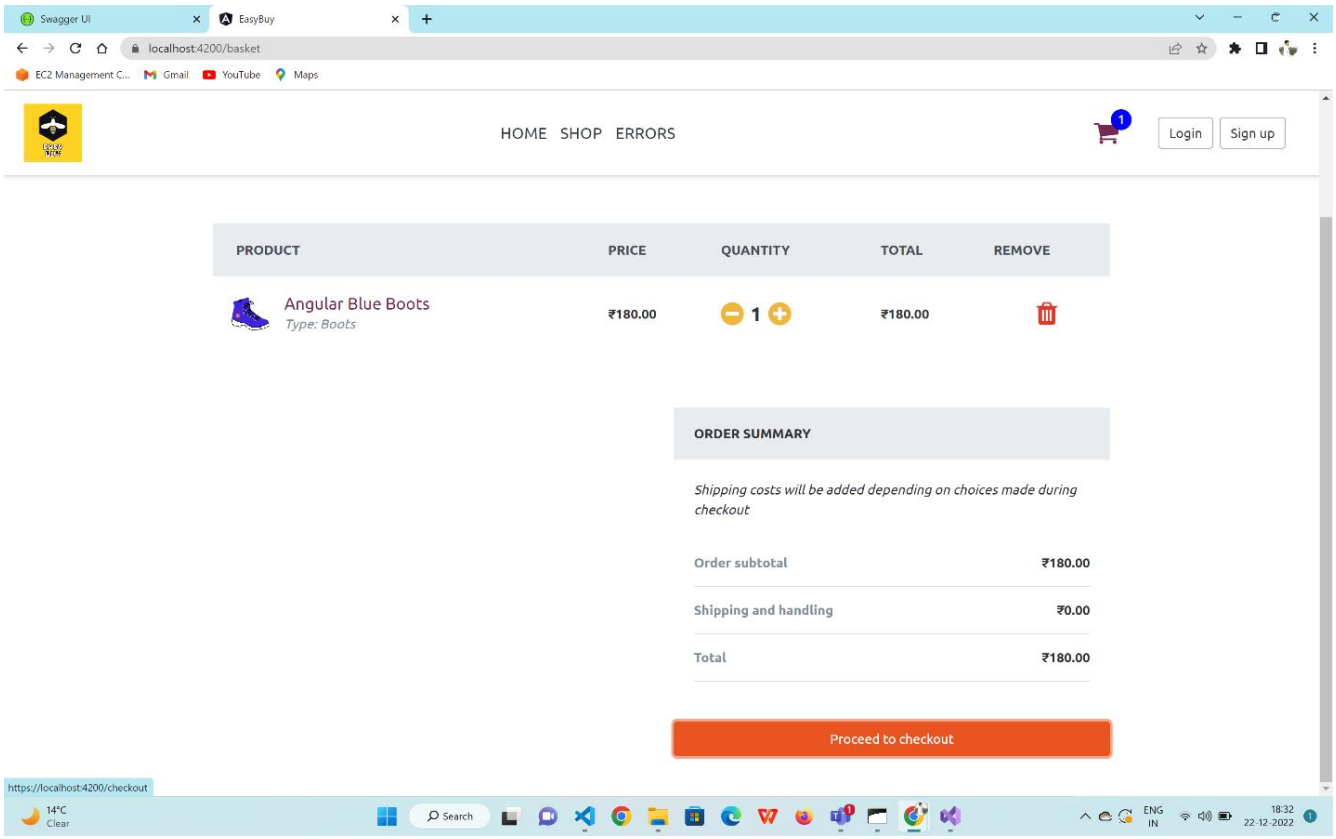
Swagger UI
EasyBuy
localhost:4200/basket
EC2 Management C...
Gmail
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Maps
HOME SHOP ERRORS
Login
Sign up
PRODUCT
PRICE
QUANTITY
TOTAL
REMOVE
Angular Blue Boots
Type: Boots
₹180.00
1
₹180.00
ORDER SUMMARY
Shipping costs will be added depending on choices made during checkout
Order subtotal
₹180.00
Shipping and handling
₹0.00
Total
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Proceed to checkout
https://localhost:4200/checkout
14°C
Clear
Search
ENG
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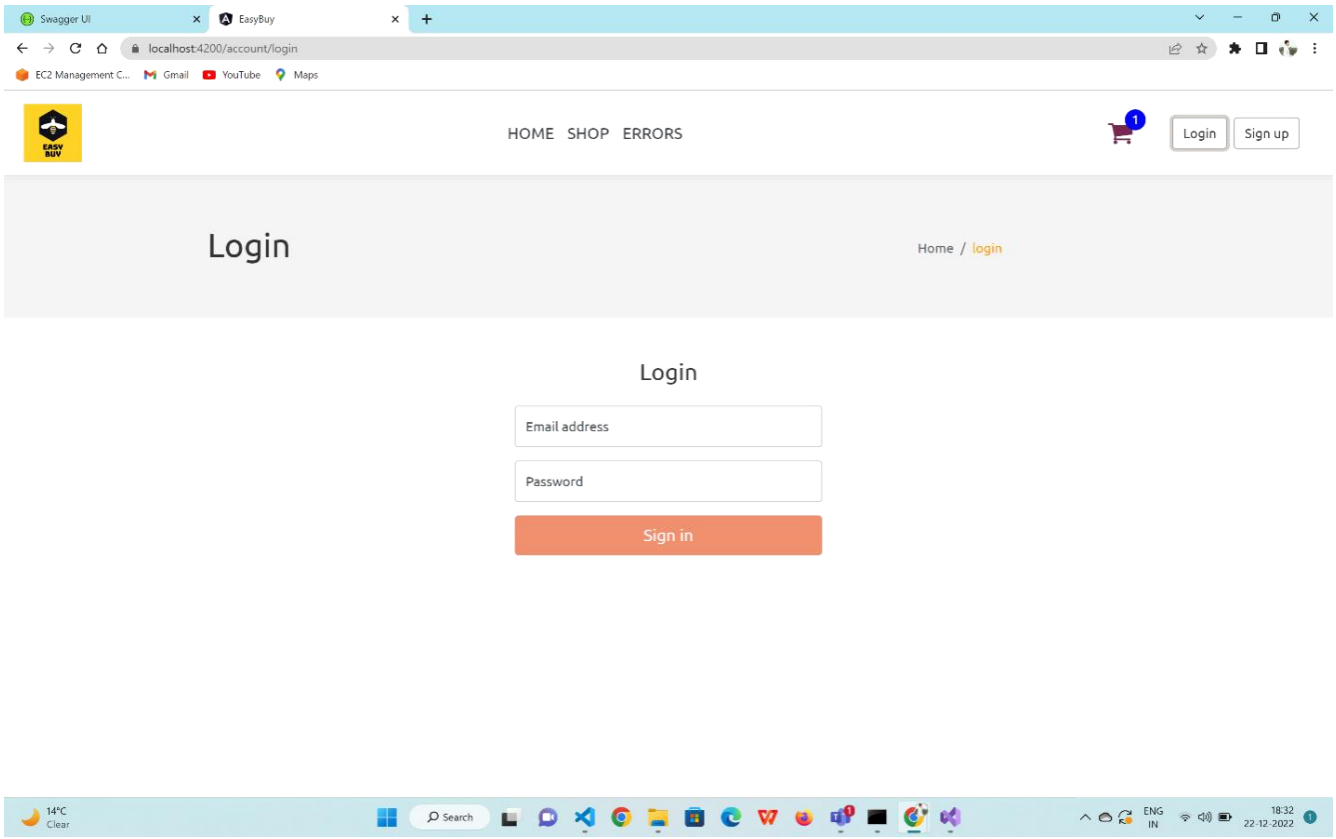
18:32
22-12-2022

7.6 LOGIN


Swagger UI
EasyBuy
localhost:4200/account/login
EC2 Management C...
Gmail
YouTube
Maps
HOME
SHOP
ERRORS
Login
Sign up
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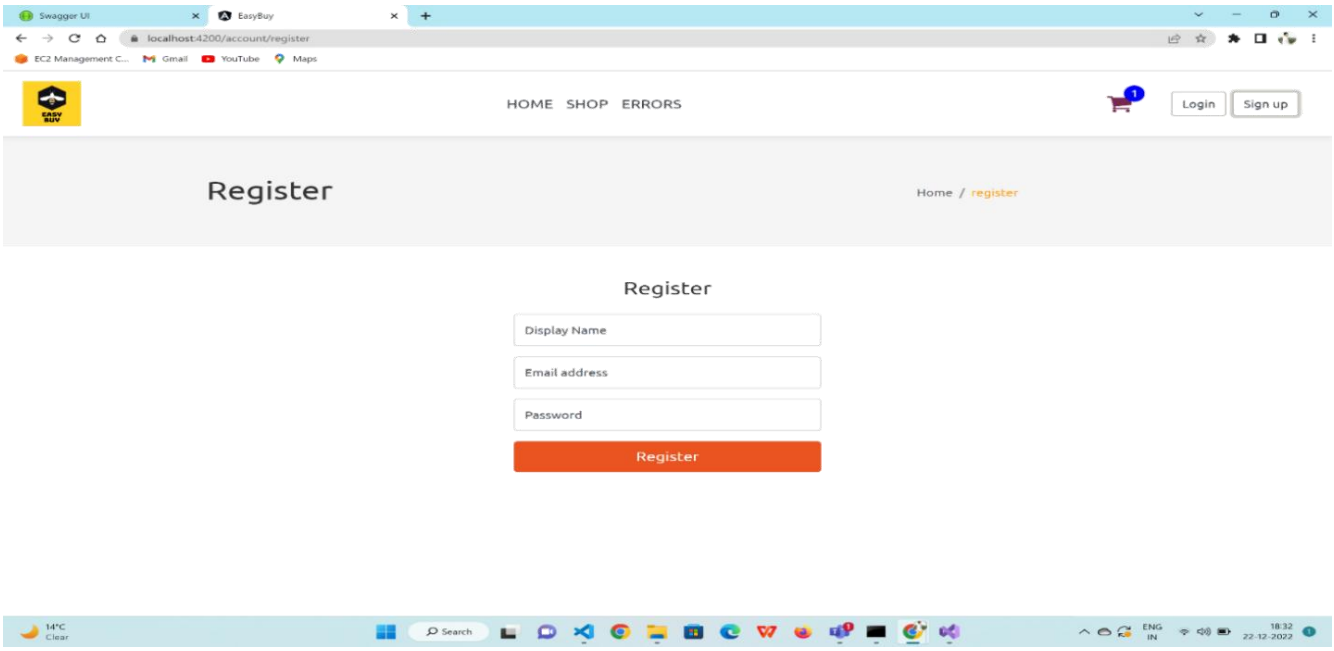
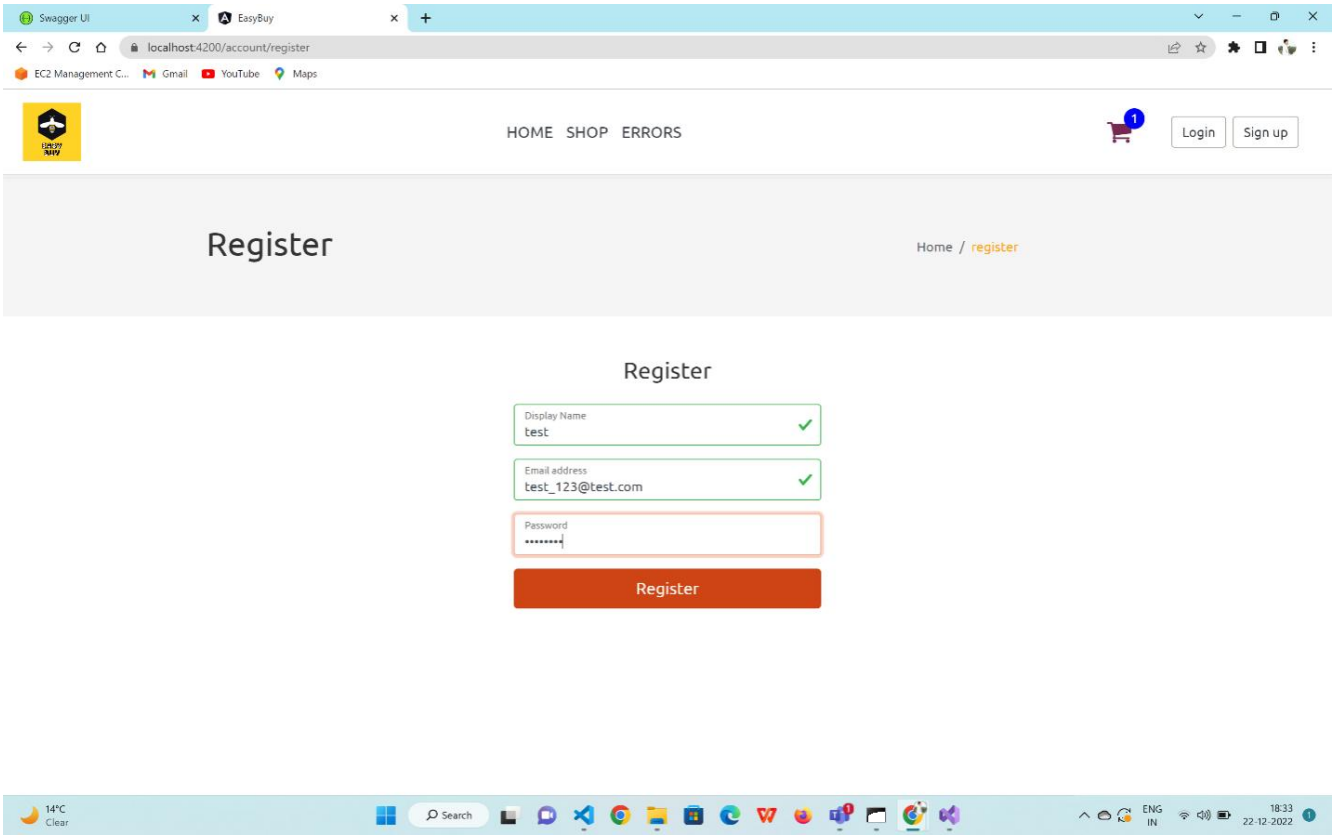
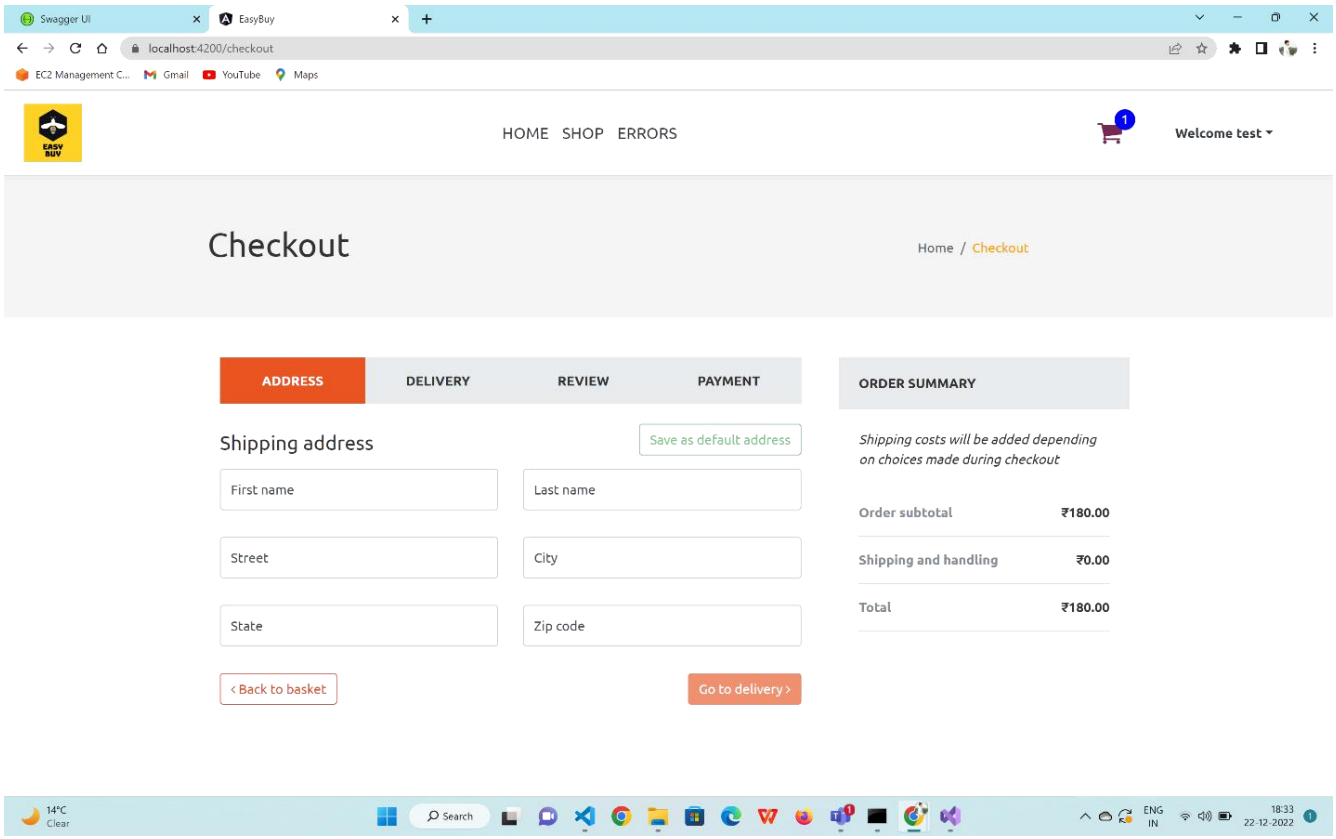
7.7 REGISTRATION





7.8 CHECKOUT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Maps
HOME SHOP ERRORS
1
Welcome test
Checkout
Home / Checkout
ADDRESS
DELIVERY
REVIEW
PAYMENT
Shipping address
Save as default address
First name
Last name
Street
City
State
Zip code
‹ Back to basket
Go to delivery ›
ORDER SUMMARY
Shipping costs will be added depending on choices made during checkout
Order subtotal ₹180.00
Shipping and handling ₹0.00
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14°C
Clear
Search
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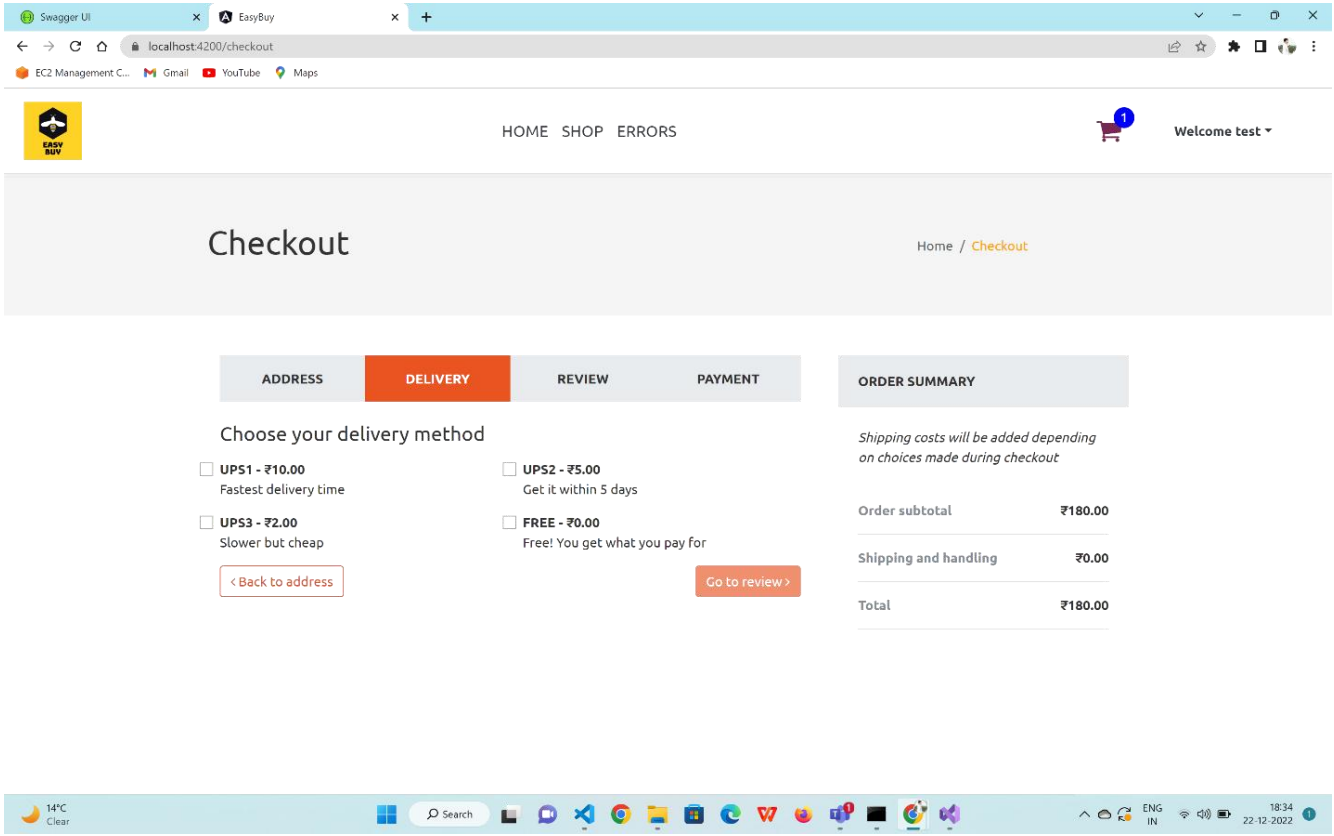
22-12-2022

7.9 DELIVERY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EC2 Management C...
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YouTube
Maps
HOME SHOP ERRORS
Welcome test
Checkout
Home / Checkout
ADDRESS
DELIVERY
REVIEW
PAYMENT
Choose your delivery method
UPS1 - ₹10.00
Fastest delivery time
UPS2 - ₹5.00
Get it within 5 days
UPS3 - ₹2.00
Slower but cheap
FREE - ₹0.00
Free! You get what you pay for
‹ Back to address
Go to review ›
ORDER SUMMARY
Shipping costs will be added depending on choices made during checkout
Order subtotal ₹180.00
Shipping and handling ₹0.00
Total ₹180.00
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Search
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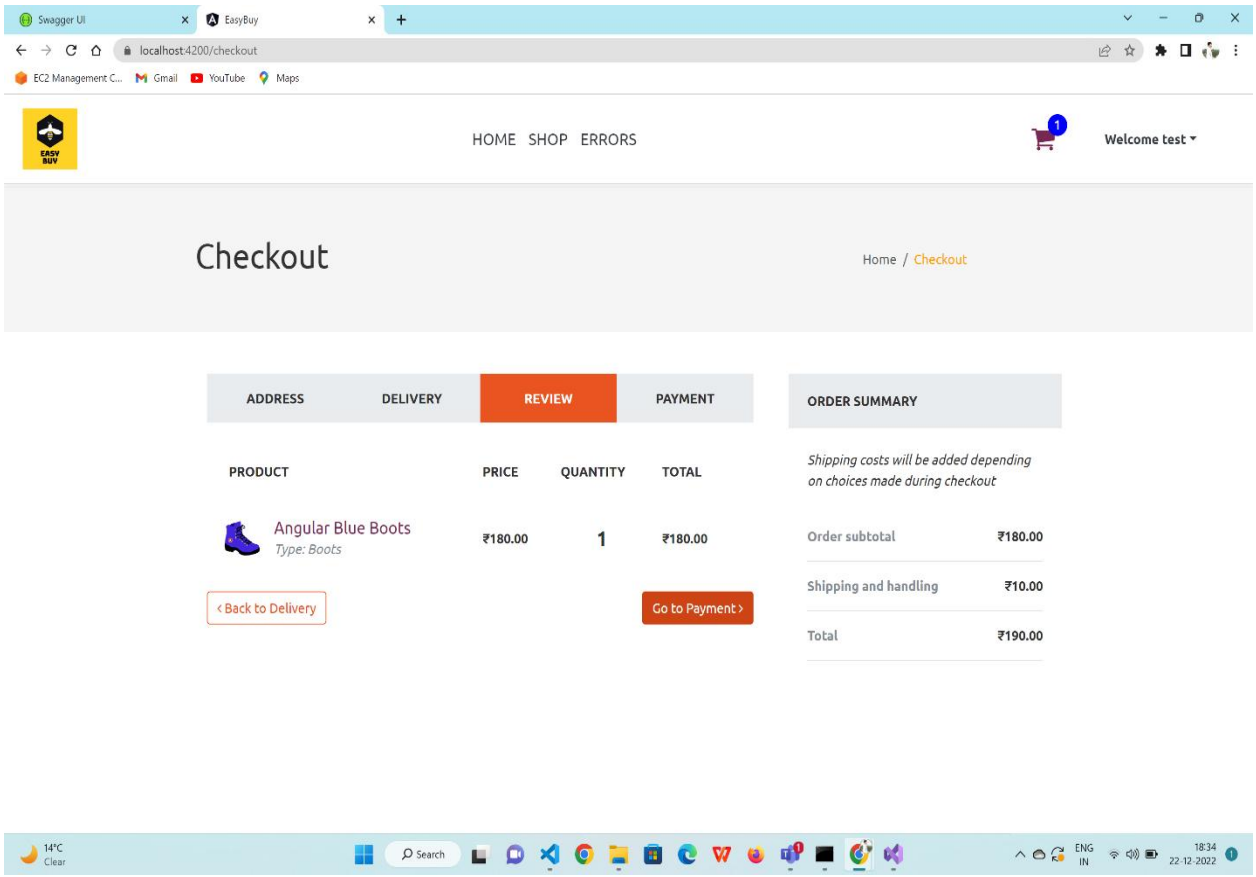
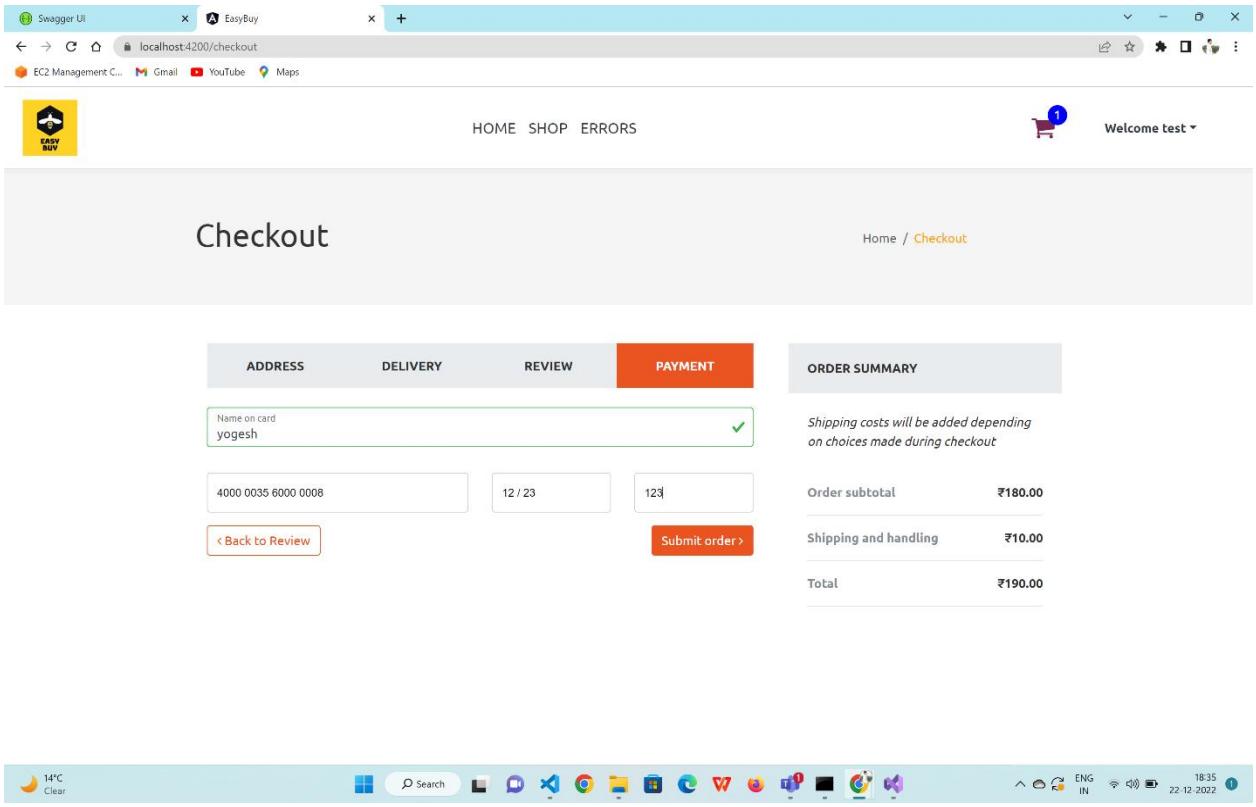
22-12-2022

7.10 **REVIEW ORDER**



7.11 PAYMENT


Swagger UI
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DELIVERY
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PAYMENT
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‹ Back to Review
Submit order ›
ORDER SUMMARY
Shipping costs will be added depending on choices made during checkout
Order subtotal ₹180.00
Shipping and handling ₹10.00
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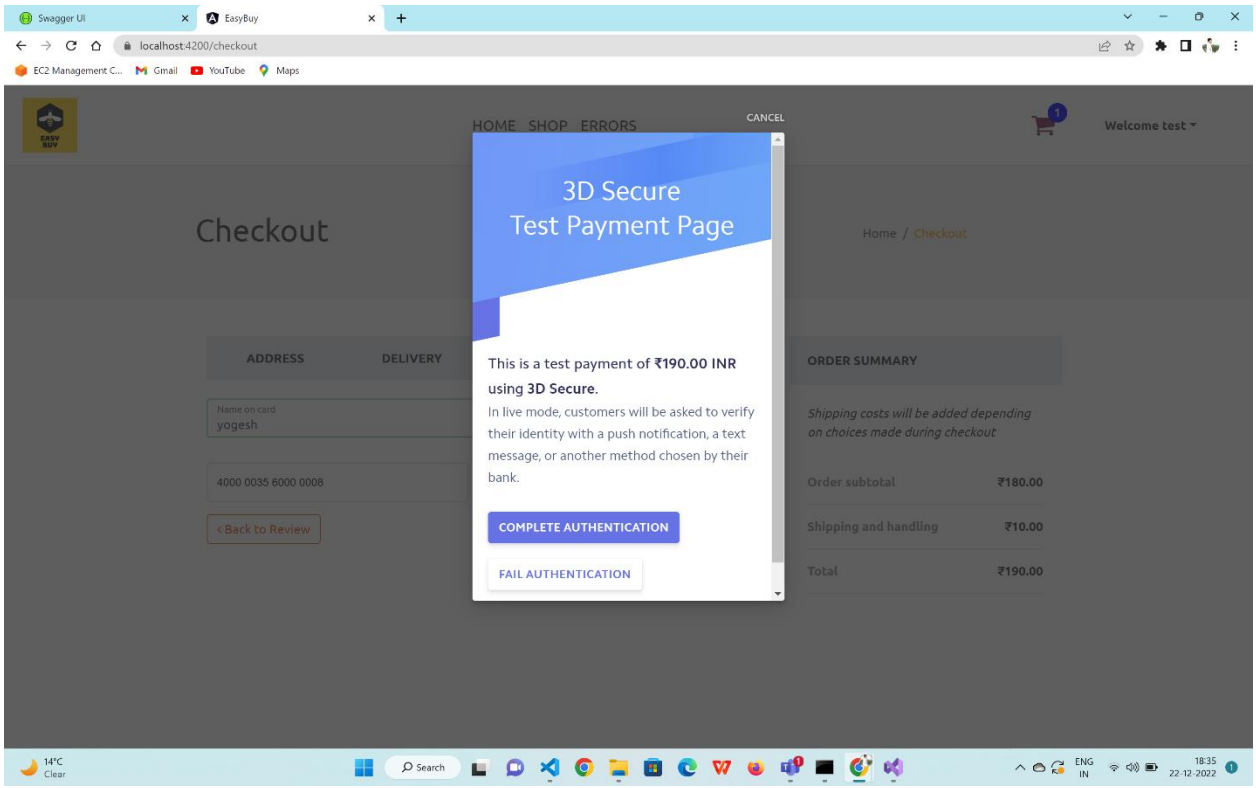
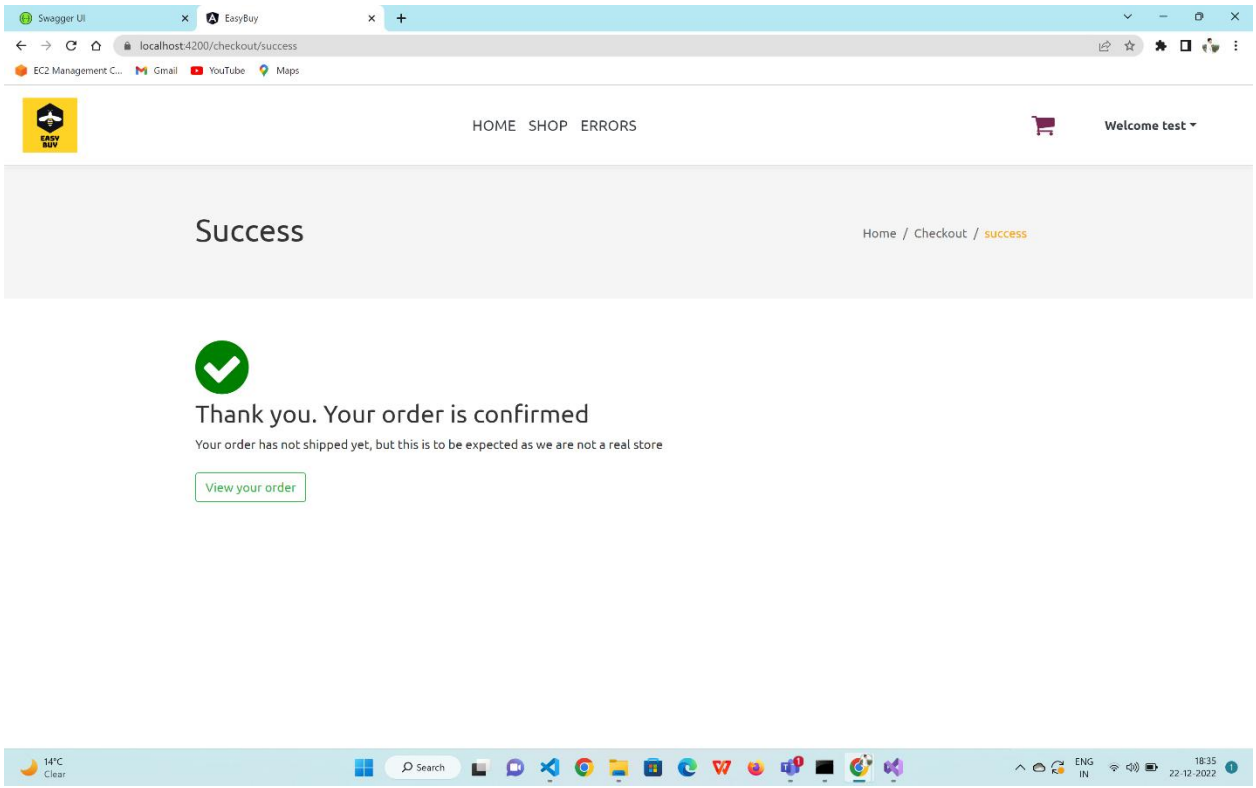
22-12-2022

7.12 AUTHENTICATION FOR PAYMENT



7.13 PAYMENT SUCCESS



CHAPTER 8
CONCLUSION

The project entitled EasyBuy system was completed successfully. The system has been developed with much care and free of errors and at the same time it is efficient and less time consuming. The purpose of this project was to develop a web application for purchasing items from a fashion shop. This project enabled me gain valuable information and practical knowledge on several topics like designing web pages using html & CSS, usage of responsive templates, designing web-application using .NET, and management of database using SQL Management Server Studio.

The entire system is secured. Also, the project helped me develop an understanding about the development phases of a project and software development life cycle. I learned how to test different features of a project. This project has given me great satisfaction in having designed an application which can be implemented to any nearby shops or branded shops selling various kinds of products by simple modifications. However, it was very challenging learning and developing an application using a new technology.

CHAPTER 9
RECOMMENDATION

There is a scope for further development in our project to a great extent. A number of features can be added to this system in future like providing. The feature like adding an authenticated payment system using Mpesa which is widely used in Kenya. Another feature we wished to implement was providing classes for customers so that different offers can be given to each class. System may keep track of history of purchases of each customer and provide suggestions based on their history using Machine Learning Algorithm. These features could have been implemented if time and skills did not limit me.

1. 'New Normal' in Ecommerce

The coronavirus has made an immense contribution to the sudden growth of the ecommerce industry. When COVID19 was first declared as a global pandemic, people started stocking up. The panic-buying behavior of the masses meant they wanted to get their hands on things as fast as possible. As store supplies started to run out, ecommerce transactions went up because people desperately needed alternatives.

2. Automated Shipping for Speedy Delivery

When we talk about the future of ecommerce, the potential of automated shipping cannot be ignored. As more customers buy online, the need to open strategically located fulfillment centers has been significantly increasing to deliver orders in the shortest amount of time.Automated shipping is definitely one of the most important ecommerce future trends that you should look out for and aim to optimize your store with. Not only will this take away the worrisome task of aligning shipments, it will also result in faster and timely deliveries to your customers.

3. Personalized Communication and Customer Service Through AI and Chatbots

According to a Gartner survey, AI and machine learning will handle 40% of all customer interactions by the year 2023. This means that the future of ecommerce holds a lot of room for growth when it comes to AI and chatbots.More and more ecommerce businesses are starting to incorporate chatbots into their online stores because of the convenience they offer to the customers as well as the businesses. According to Juniper Research, chatbots will save 2.5bn hours for customers as well as businesses by 2023.

CHAPTER 10
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