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Research and Development of E-commerce Website

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Abstract: ***Once upon a time, we were going to market to buy or sell our essentials or household items at a very nominal price. The market was organized once or twice a week. After this era, when we needed something, we would go to the shop and buy anything that we needed. And now, the internet has already been discovered. This has changed the life of every individual on this planet. After the coming of the internet, every year, some new technologies are coming with new innovative features that fulfill our requirements easily and make us more comfortable. Web development is one of them. By using this technology, e-commerce websites are designed. E-commerce has grabbed the economical market of shopping. Through these websites, buyers can buy or sellers can sell anything at very fair prices that they will buy or sell accordingly. This research paper includes introduction, literature survey, definition, system design, management, implementing steps, payment procedure, problems and many more about e-commerce.***

Keywords: Website development, E-commerce, Internet, HTML, CSS, JavaScript, MySQL, PHP.

I. INTRODUCTION

E-commerce is the procedure of buying and selling goods or services using the internet. It includes the exchange of products or services between buyers, sellers, or both. E-commerce is simplified through websites and mobile applications. E-commerce is supported by online business. There are three areas of e-commerce: online peddle, e-markets, and online chaffer. There are five essential categories of e-commerce: B2B, B2C, B2G, C2B, and C2C. E-commerce is useful for those who do not have time for shopping. It helps people make purchases online. A user can login to an e-commerce website, and once he or she logs in, they are automatically directed to the customisable home page of the website with the help of AI-ML. Once the user selects an item, it will be added to the cart. If the customer thinks that the chosen item is not useful for them, then they can delete that item from their cart. This system helps to buy or sell products online using the internet. E-commerce helps humans avoid wasting time shopping.

E-commerce trades may also assign some or all of the following:

1) Online shopping for retail sales direct to consumers via web sites and mobile apps; conversational commerce via live chat, chatbots, and voice assistants.
2) Sharing in online chambers of commerce, which process third-party B2C or C2C sales.
3) Business-to-business (B2B) buying and selling.
4) Gathering and using demographic data through web contacts and social media.
5) B2B electronic data interchange.
6) Marketing to prospective and established customers by email (for example, with newsletters).
7) Engaging in pretail for launching new products and services.
8) Online economic exchanges for money exchanges or dealing purposes.

II. LITERATURE SURVEY

The term was coined and first employed by Robert Jacobson, Principal Consultant to the California State Assembly's Utilities & Commerce Committee, in the title and text of California's Electronic Commerce Act, carried by the late Committee Chairwoman Gwen Moore (D-L.A.) and enacted in 1984.

Most of us have shopped online for something at some point. But very few people may know that e-commerce has a history that goes back to before the internet began. E-commerce actually goes back to the 1960s when companies used an electronic system called the EDI (Electronic Data Interchange) to facilitate the transfer of documents. It was 1994 that the very first transaction took place. This involved the sale of a CD between friends through an online retail website called NetMarket. The industry has gone through so many evolutionary changes. These e-commerce websites created a virtual marketplace for goods and services that consumers can easily access. People can connect with businesses through smartphones and other devices and by downloading apps to make purchases. The introduction of free shipping, which reduces costs for consumers, has also helped increase the popularity of the e-commerce industry.

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A. Timeline:

1969: CompuServe was founded
1971 or 1972: The ARPANET is used to arrange a cannabis sale between students.
1979: Michael Aldrich demonstrates the first online shopping system.
1981: Thomson Holidays UK is the first business-to-business (B2B) online shopping system.
1982: Boston Computer Exchange launches.
1983: California State Assembly holds first hearing on "electronic commerce" in Volcano, California. Testifying are CPUC, MCI Mail, Prodigy, CompuServe, Volcano Telephone, and Pacific Telesis.
Karen Earle Lile (AKA Karen Bean) and Kendall Ross Bean create e-commerce service (for piano buying or selling) in San Francisco Bay Area.
1984: Gateshead SIS/Tesco is first B2C online shopping system and Mrs Snowball, 72, is the first online home shopper.
In April 1984, CompuServe launches the Electronic Mall in the US and Canada.
1989: In May 1989, Sequoia Data Corp. introduced Compumarket, the first internet based system for e-commerce.
1990: Tim Berners-Lee writes the first web browser, WorldWideWeb, using a NeXT computer.
1992: Book Stacks Unlimited launches as first online book marketplace.
1993: Paget Press releases edition No. 3 of the first app store, The Electronic AppWrapper.
1994: Web browser launched Netscape Navigator.
"Ten Summoner's Tales" by Sting becomes the first secure online purchase through NetMarket.
1995: Amazon launch.
eBay is founded by computer programmer Pierre Omidyar as AuctionWeb.
1998: PayPal launches as an ecommerce payment system.
1999: Global e-commerce reaches $150 billion.
2000: Google introduces Google AdWords as an online advertising tool.
2001: Alibaba.com achieved profitability in December 2001.
2002: eBay acquires PayPal for $1.5 billion.
2004: DHgate.com, China's first online B2B transaction platform, is established.
2007: Business.com acquired by R.H. Donnelley for $345 million.
2009: BigCommerce launches.
2011: Stripe launches.
2016: The Government of India launches the BHIM UPI digital payment interface. In the year 2020 it has 2 billion digital payment transactions.
2017: Global e-commerce transactions generate $29.267 trillion, including $25.516 trillion for business-to-business (B2B) transactions and $3.851 trillion for business-to-consumer (B2C) sales.

III. DEFINITION OF E-COMMERCE IN INDIA

India’s e-marketplace is one of the fastest-progressing in the world. The value of Indian e-commerce was $46.2 billion in 2020 and is expected to reach US$111 billion by 2024 and US$200 billion by 2026. India’s conventional commerce has the capability to enlarge to US$ 16–20 billion in the financial year 2025, developing at a CAGR of 55–60%. E-commerce activity is increasing, as is the use of digital payment systems. India has obtained 125 million online purchasers in the past three years, with another 80 million awaited by 2025. India's B2B e-marketplace would have a US$200 billion scope by 2030. Momentum in this sales channel has been steadily growing but was amplified during the COVID-19 pandemic. E-commerce is subject to the Competition Act issued by the Indian government to introduce pricing and allocation laws. To avoid competition law violations, U.S. organisations should be aware of such provisions and encircle topical courses in ordering fellowship contracts. India has been established as a set-up destination for suppliers focused on online sales due to its huge customer base, miscellaneous demographics, low-cost digital infrastructure and services, and supply chain ecosystem.

A. Primary Factors in E-commerce

In recent years India has experienced a boom in internet and smartphone penetration. The number of internet connections in 2021 increased significantly to 830 million, driven by the ‘Digital India’ programme. Out of the total internet connections, ~55% of connections were in urban areas, of which 97% of connections were wireless.

The smartphone base has also increased significantly and is expected to reach 1 billion by 2026. This has helped India's digital sector and it is expected to reach US$ 1 trillion by 2030. India's e-commerce sector has transformed the way business is done in India and has opened various segments of commerce ranging from business-to-business (B2B), direct-to-consumer (D2C), consumer-to-consumer (C2C) and consumer-to-business (C2B). In India, cash on delivery is the most preferred payment method, accumulating 75% of the e-retail activities. Demand for international consumer products (including long-tail items) is growing faster than in-country supply from authorised distributors and e-commerce offerings. Choosing the right payment gateway facilitates seamless transactions and protects customer data. Select a reputable payment processor that supports various payment methods and currencies. Efficient shipping and fulfilment processes are vital for customer satisfaction. Cash on delivery is also one of the prominent underlying factors that have contributed to the growth of the e-commerce industry in India according to the times of India. In 2021 approx fifty percent of payments in tier-1 cities of India are done via cash on delivery whereas more than seventy percent payments are done through cash on delivery through tier-2/tier3 cities.

B. Growth

The Indian e-commerce industry has been on an upward growth trajectory and is expected to surpass the US to become the second-largest E-commerce market in the world by 2034. Technology-enabled innovations like digital payments, hyper-local logistics, analytics-driven customer engagement and digital advertisements will likely support the growth in the sector. In FY 2022-23, Government e-marketplace (GeM) registered its highest ever Gross Merchandise Value of $2011 Bn. GeM has achieved a cumulative GMV of more than 4.5 Lakh Cr until 23rd Jul 2023 (since inception). As per TRAI's Indian Telecom Services Performance Indicators Jul-Sept 2023, the internet penetration in India as of Sept 2023, is over 918.19 Mn, and the number of telecom subscribers as of Feb 2024 is over 1197 Mn. Open Network for Digital Commerce (ONDC) will enable e-commerce platforms to synchronize search results on all the e-commerce platforms and display products and services from every platform. This will further boost business for MSMEs and help fuel India's e-commerce growth. The growth will encourage employment, increase revenues from exports and tax collection by exchequers, and provide better products and services to customers in the long term. India's e-retail market is expected to continue its strong growth - it registered a CAGR of over 35% to reach Rs. 1.8 trillion (US$ 25.75 billion) in FY20. Over the next five years, the Indian e-retail industry is projected to exceed ~300-350 million shoppers, propelling the online Gross Merchandise Value (GMV) to US$ 100-120 billion by 2025.

C. Challenges

There has been a growth in challenges faced by companies in India, which include:

1) *Payment mode:* In India, most people prefer to pay cash on delivery due to the low credit card diffusion and low trust in online transactions. Not like electronic payments, manual cash collection is quite perilous, expensive, and laborious.
2) *Product return:* Customers are still not sure about what to expect from eCommerce websites; thus, purchasers fall prey to hard sell. Finally, when the product is delivered, they started feeling regret and return the goods. For eCommerce retailers, returns are extremely expensive as it shows some unique challenges and it becomes more difficult.
3) *Delivery location:* Once if you place an online order, you will get a call from the company, asking about your exact location. The given address is not enough because there is always a little standardization while writing post addresses.
4) *Cyber and Data security:* When it comes to eCommerce, one of the biggest challenges faced is security breaches. There is a lot of information/data that is involved while dealing with eCommerce and a technical issue with data can cause severe damage to the retailer's daily operations as well as brand image.
5) *Logistics:* Companies across the world are affected by supply chain issues every year, and considering it is a layered process, issues and errors occur at multiple steps during the process, which leads to added expenses and delays.

IV. SYSTEM DESIGN

Systems Design is the process of defining the architecture, components, modules, interfaces, and data for a system to satisfy specified requirements. It involves translating user requirements into a detailed blueprint that guides the implementation phase. The goal is to create a well-organized and efficient structure that meets the intended purpose while considering factors like scalability, maintainability, and performance.

System Module Description:

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A. Coding

Coding refers to the process of building a website that can be later used to process the request of customers. It is a standalone site that can handle multiple requests of people at once so that the seller can fulfill the order. E-commerce website is made by scripting languages like HTML, CSS, JavaScript and PHP.

1) *HTML:* Hyper Text Markup Language or HTML is the standard markup language for documents designed to be displayed in a web browser. It defines the content and structure of web content. It is often assisted by technologies such as Cascading Style Sheets (CSS) and scripting languages such as JavaScript. HTML elements are the building blocks of HTML pages. With HTML constructs, images and other objects such as interactive forms may be embedded into the rendered page. HTML provides a means to create structured documents by denoting structural semantics for text such as headings, paragraphs, lists, links, quotes, and other items. A form of HTML, known as HTML5, is used to display video and audio, primarily using the <canvas> element, together with JavaScript.
2) *CSS:* Cascading Style Sheets (CSS) is a stylesheet language used to describe the presentation of a document written in HTML or XML (including XML dialects such as SVG, MathML or XHTML). CSS describes how elements should be rendered on screen, on paper, in speech, or on other media. CSS is designed to enable the separation of content and presentation, including layout, colours, and fonts. This separation can improve content accessibility, provide more flexibility and control in the specification of presentation characteristics. While HTML lays the skeleton of the website CSS can use those attributes and improve the layout of the website. CSS has since become more adapted to having more features, for instance we will now use the tools and alter the background to an enormous array of colours.
3) *JavaScript:* JavaScript is a lightweight interpreted programming language with first-class functions. While it is most well-known as the scripting language for Web pages, many non-browser environments also use it, such as Node.js, Apache CouchDB and Adobe Acrobat. JavaScript is a prototype-based, multi-paradigm, single-threaded, dynamic language, supporting object-oriented, imperative, and declarative styles. 99% of websites use JavaScript on the client side for webpage behaviour. Web browsers have a dedicated JavaScript engine that executes the client code. These engines are also utilized in some servers and a variety of apps. The most popular runtime system for non-browser usage is Node.js. JavaScript is a high-level, often just-in-time compiled language that conforms to the ECMAScript standard. It has dynamic typing, prototype-based object-orientation, and first-class functions.
4) *PHP:* PHP (recursive acronym for PHP: Hypertext Preprocessor) is a widely-used open source general-purpose scripting language that is especially suited for web development and can be embedded into HTML. PHP is a general-purpose scripting language geared towards web development. It was originally created by Danish-Canadian programmer Rasmus Lerdorf in 1993 and released in 1995. The PHP reference implementation is now produced by the PHP Group. PHP was originally an abbreviation of Personal Home Page, but it now stands for the recursive initialism PHP: Hypertext Preprocessor. PHP code is usually processed on a web server by a PHP interpreter implemented as a module, a daemon or a Common Gateway Interface (CGI) executable. On a web server, the result of the interpreted and executed PHP code which may be any type of data, such as generated HTML or binary image data would form the whole or part of an HTTP response.

B. Database

A database is an organized collection of structured information, or data, typically stored electronically in a computer system. A database is usually controlled by a database management system (DBMS). Together, the data and the DBMS, along with the applications that are associated with them, are referred to as a database system. Databases can be of various types, but they are typical of two types:

1) *SQL Databases:* SQL is a programming language used by nearly all relational databases to query, manipulate, and define data, and to provide access control. SQL was first developed at IBM in the 1970s with Oracle as a major contributor, which led to implementation of the SQL ANSI standard, SQL has spurred many extensions from companies such as IBM, Oracle, and Microsoft. Although SQL is still widely used today, new programming languages are beginning to appear. Ex- SQLite, MYSQL.
2) *NoSQL Databases:* A NoSQL, or nonrelational database, allows unstructured and semistructured data to be stored and manipulated (in contrast to a relational database, which defines how all data inserted into the database must be composed). NoSQL databases grew popular as web applications became more common and more complex. Ex- MongoDB.

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C. Management

E-commerce management is the process of planning, executing, and overseeing all activities designed to achieve online business goals across a range of areas. E-commerce management encompasses a range of essential components that are crucial for running a successful online business. From handling inventory and order fulfilment to maintaining excellent customer relationships and optimizing website performance, each aspect plays a significant role in the overall success of an E-commerce venture. The key components of E-commerce management is Inventory Management, Order Fulfilment, Customer Relationship Management (CRM), Payment Processing and Security, Website Performance and Optimization. Websites need to be monitored and updated regularly in order to serve their purpose. A well-maintained website will attract new customers and keep existing customers coming back. Website maintenance is crucial when it comes to ranking in search engines. If your website isn't ranking highly when someone searches for the type of products or services you offer, your competition is going to wind up getting their business. Website is a reflection of our brand. It's important to routinely take a look at the look and feel of your website to ensure you're keeping up with trends and that it's fully functional and error-free. Website analytics help us optimize pages that bring in the most conversions and build out or expand upon content that people find valuable. Unless the site is managed properly, bugs and other glitches may arise which can hinder the shopping experience, costing you customers who will quickly move on to another seller's site.

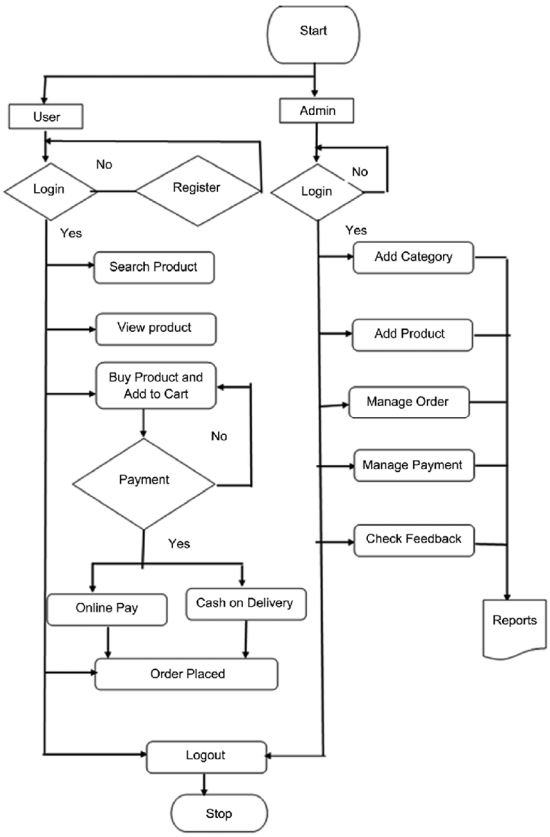


Fig.1 System Design of E-commerce

D. Payment System

An e-commerce or electronic payment system enables transactions over an electronic mode of payment without the involvement of physical money or cheques at the time of transaction. Electronic payment techniques are used by e-commerce enterprises to collect payment for their products and services. The procedure of conducting business online has been dramatically changed by the e-commerce payment systems which have made it simple for both businesses and customers. A payment gateway is used to link a virtual storefront to the payment processing network of your choosing in an online payment system. A robust payment gateway provides multiple secure e-commerce payment options to your customers. To clear your funds, this processing network also collaborates with your bank. The growing use of internet-based banking and shopping has seen the growth of various e-commerce payment systems and technology has been developed to increase, improve and provide secure e-payment transactions. Paperless e-commerce payments have revolutionised the payment processing by reducing paper work, transaction costs, and personnel cost.

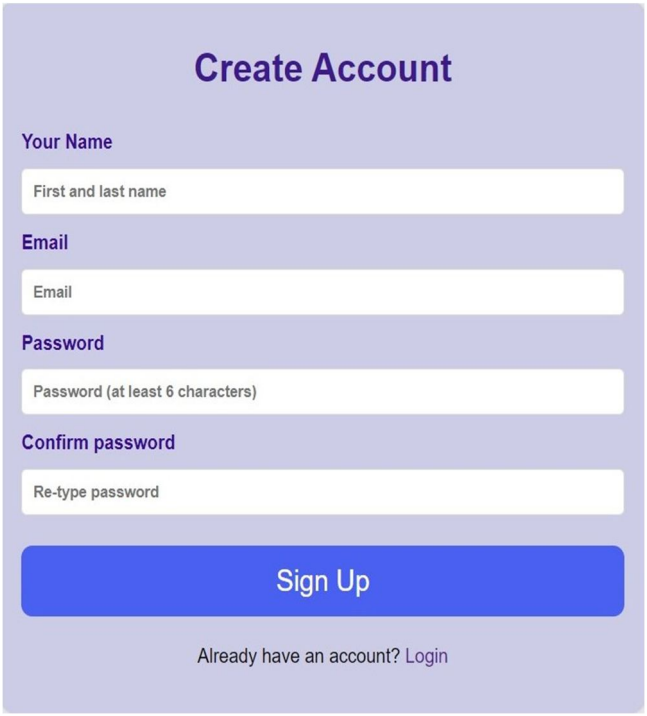
The systems are user-friendly and consume less time than manual processing and help businesses extend their market reach. The different types of e-commerce payments in use today are Credit/Debit Card, E-wallet, UPI, Net Banking, Bank Transfer and Cash On Delivery (COD).

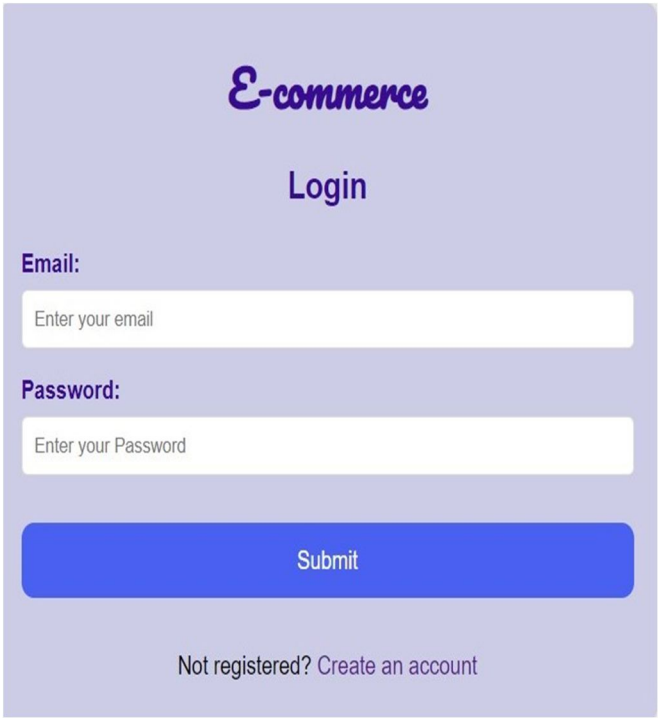
E. Delivery

E-commerce delivery refers to the transport of products ordered from your online store to your customers' physical address. Shipping of goods to customers is an important part of the e-commerce logistics process. It involves numerous places, people and working parts. An e-commerce shipping strategy is more important than many realize. Consumers expect fast, affordable, easy shipping, and offering as much can give you a leg up on your competition. But ecommerce shipping is about more than just free shipping and fast delivery. Ecommerce shipping encompasses all services required to transport products purchased online from a retailer to the customer's delivery destination. With the right partner, e-commerce shipping can be manageable, affordable, and fast. In a recent survey on how delivery affects consumers' perception of and satisfaction with online shops, 60% of respondents chose to buy from a competitor's e-commerce site that had more expedient shipping options, and 74% of customers actually value free shipping very highly. Consumers are most familiar with last-mile delivery, where goods purchased online are brought to their doorsteps by a carrier. E-commerce delivery involves order processing, order fulfilment and return processing. When it comes to delivery of products, every e-commerce store must take into account a variety of considerations, such as the choice of packaging materials, shipping carrier and shipment tracking. Many people may think that all they need to pay for is the courier who facilitates last-mile delivery of goods to customers. It requires extensive networking, logistics, and manpower support. There is a need for extensive technology to track and support the process and one of the biggest barriers is international orders and their limitations. A facilitative regulatory environment can rapidly increase these trends and makes the business case for operating in smaller or more remote markets that way more appealing.

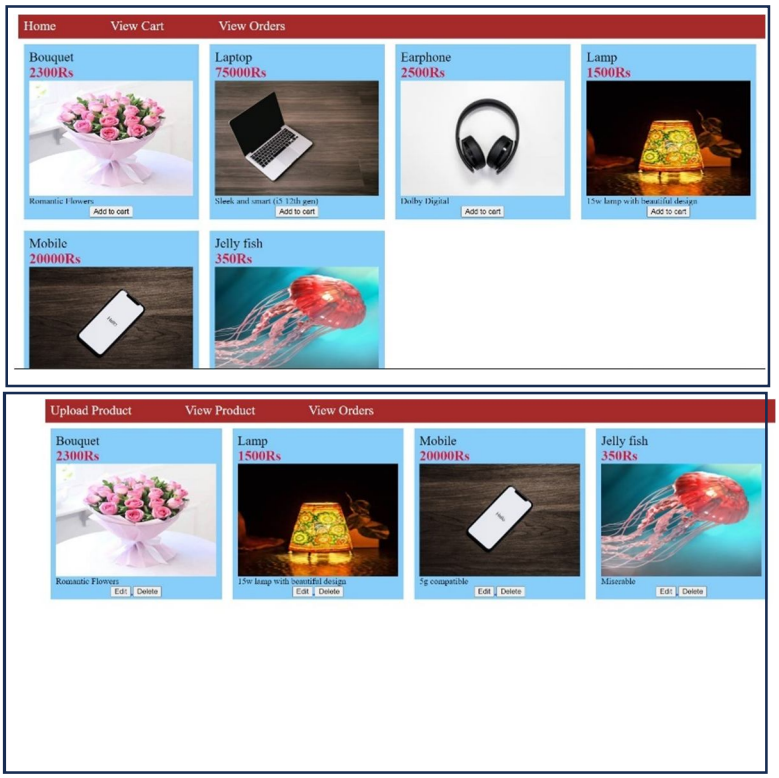
V. IMPLEMENTING STEPS

1) *Signup/Login Page:* Signup menu is provided to user. Login menu and update profile menu is provided to registered. User get proper guidance for their schedule diet and exercise which is prepared according to their body mass index and their profession.

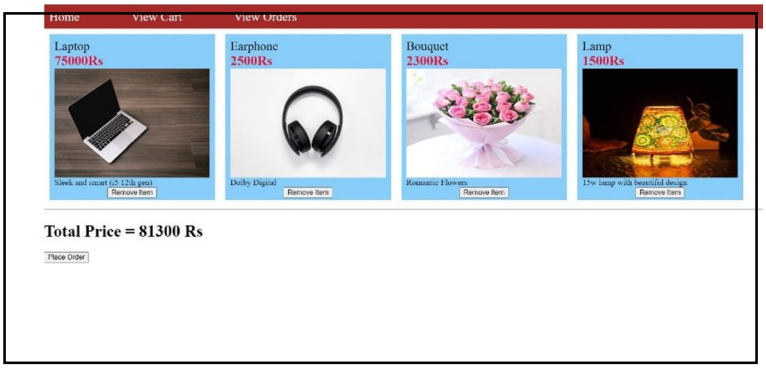




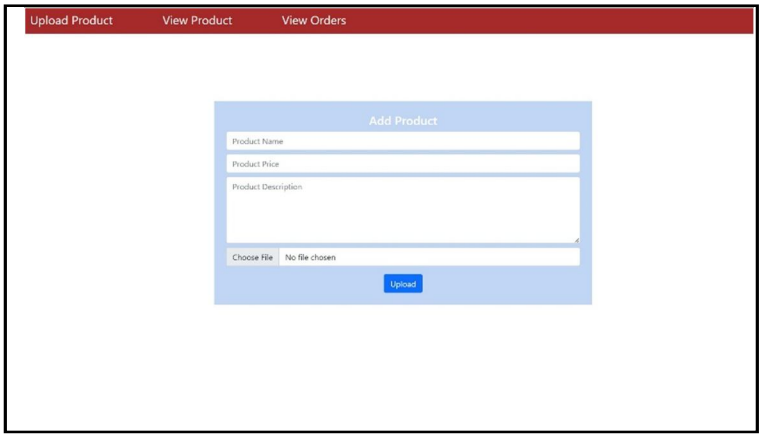
2) *Home Page:* The Home Screen will consist of screen where one can browse through the products which we have on our website. There are two homepages: buyer and seller.



3) *Cart Page:* Users can track, ship orders here.



4) *Add Product:* Sellers can add their products in the website.



VI. CONCLUSIONS

The research and development of e-commerce is a complicated and versatile action that obstructs several perspectives, containing user interface and experience design, client and server side functionalities, database design, fetching data, payment systems, delivery and logistics, and many more. The development of an e-commerce website claims a user-integrated gateway, a reactive design, strong safety and security, smooth verification, and enhancements. This e-commerce website is developed using HTML, CSS, JavaScript, PHP, and MySQL. This research paper is perfectly accomplished with ultimate satisfaction. After studying many research papers, we can conclude that a more maintainable way would be to develop e-commerce and primary business edgeways because of huge and isolated population.

VII. ACKNOWLEDGEMENT

We would like to express our earnest gratitude to those who have contributed to the accomplishments of this research paper on the research and development of e-commerce websites. Firstly, I would like to thank my respected professors and classmates for their guidance, expertise and invaluable feedback throughout this research process. Their support and encouragement have been helpful in implementing this paper. I am obliged to give special thanks to Mr. Kalidas for training me to develop a website.

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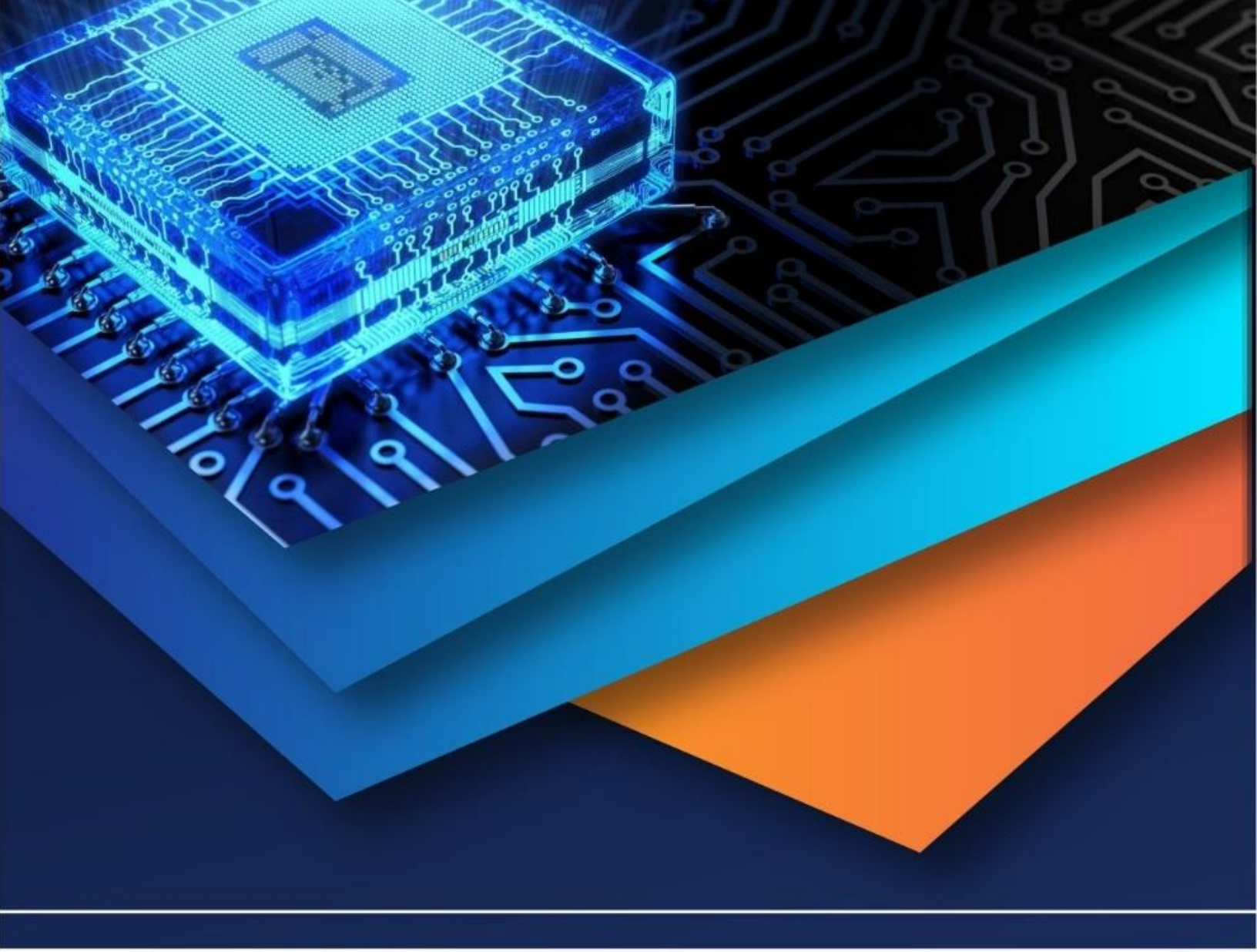

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