Smart Gadget Store

A Project Report Submitted in Partial Fulfillment of the Requirements for the Degree of Bachelor of Science in Computer Science & Engineering.

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APPROVAL

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Board of Examiners

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DECLARATION

We, hereby, declare that the work presented in this Project report is the outcome of the investigation performed by us under the supervision of Sumya Akter, Lecturer, Department of Computer Science and Engineering, Northern University of Bangladesh. We also declare that no part of this Project has been or is being submitted elsewhere for the award of any degree or diploma.

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Abstract

E-commerce, known as E-Gadget, revolutionizes business by leveraging computer networks. Individuals can conveniently access the Internet from their computers to engage in buying or selling goods and services. Unlike traditional commerce, which demands physical effort to obtain products, e-commerce streamlines processes, reducing physical labor and saving time. Despite its inception in the early 1990s, the growth of e-commerce has been hindered by security concerns. Security remains a critical challenge in today's e-commerce landscape, with ongoing advancements needed to address emerging threats. To foster the adoption of E-Gadget in developing countries, our focus extends beyond individual consumers to include businesses. Implementing business-to-business (B2B) e-commerce facilitates access to global markets for firms in these regions. Such initiatives are crucial for developing countries where advancements in e-commerce are essential for economic growth. Our research strategy underscores the significance of E-Gadget in developing countries for various business applications. In our project, enhancing security in e-commerce is paramount. We propose a comprehensive approach, including robust encryption techniques, advanced authentication methods, and regular security audits. These measures aim to bolster confidence among users, fostering trust and enabling safer transactions. Additionally, our system prioritizes accessibility and user-friendliness, empowering individuals and businesses in developing countries to participate effectively in the digital marketplace. Through these efforts, we strive to bridge the gap and unlock the full potential of e-commerce for economic development.

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CHAPTER 1
INTRODUCTION

1.1 Background

E-commerce, or electronic commerce, refers to the buying and selling of goods and services over the internet. It operates on the premise of facilitating transactions between buyers and sellers without the need for physical interaction. This process typically involves the following key components: Online Presence: Businesses establish an online presence through websites or dedicated e-commerce platforms where they showcase their products or services. Product Listings: Sellers upload detailed descriptions, images, and prices of their offerings, allowing potential buyers to browse and compare products. Transaction Processing: Once a buyer selects a product, they proceed to the checkout process, where they provide payment and shipping information. Secure payment gateways facilitate transactions, ensuring the confidentiality and integrity of financial data. Order Fulfillment: Upon successful payment, sellers fulfill the order by packaging and shipping the product to the buyer's designated address. Customer Support: E-commerce platforms often offer customer support services to address inquiries, provide assistance, and handle returns or refunds. E-commerce has become increasingly effective in current times due to several factors: Global Reach: E-commerce transcends geographical boundaries, allowing businesses to reach customers worldwide, thereby expanding their potential customer base. Convenience: E-commerce offers unparalleled convenience to consumers, who can browse and purchase products at any time from the comfort of their homes using various devices, such as computers, smartphones, and tablets. Cost Efficiency: Operating an online store typically incurs lower overhead costs compared to traditional brick-and-mortar establishments, enabling businesses to offer competitive prices and higher profit margins. Personalization: E-commerce platforms leverage data analytics and algorithms to personalize the shopping experience for users, recommending products based on their browsing history, preferences, and demographics. And legit seller [1].

1.2 Problem Statement

If you're thinking about buying a Smart Home, odds are you have a friend or relative whose told you their system is buggy and unreliable. You're probably wondering if that's true. Well I have good news, and bad news. The bad news first. Yes, a poorly designed system, and worse yet, a poorly installed system can be buggy and unreliable. Now for the good news, the headaches are avoidable if you design the system right, and install it correctly. I've put together a list of the top problems and the solutions we see with smart homes and audio/video systems. But before I go into the list, I want to be totally honest with you. We're talking about technology here. Have you ever had to restart your iPhone? You're Android? What about your laptop? Your home network? Sure you have. We expect our technology to work 99% of the time. And we understand that once in a while, for whatever reason, the tech will get hung up. We just power cycle it. No big deal right? It's the same with smart home and audio/video systems. There's some basic maintenance involved with any system. Once in a while you need to reboot your Save Host, or your controller. Or maybe a power outage will leave an amplifier powered off. No big deal. Just press the power button, and you'll be back up and running. Anyone who tells you there are no problems with a smart home system isn't telling you the truth, or they're lying to themselves. No system is 100% perfect all the time. But they can be reliable enough to be very enjoyable, and very worth having. So with that in mind, let's look at these problems and solutions. You need a solid home network. This means you need a decent service provider, and better than average speeds. We try to avoid satellite internet. That may change in the future, but our experience thus far just hasn't been great. Over the wire service providers are preferred. You also want reliable hardware. This usually means an upgraded modem (not the one your service provider provides in the package) an upgraded wireless router, and enough wireless hotspots to adequately cover your home. After the network, this is our number one source of headaches in a home. There are two types of commands you can send to a TV: a 'discrete input;' and a 'toggle.' A discrete Input means you send a very specific command. An example of this might be devise turn on, and turn to input HDMI 3.' A toggle on the other hand is just like it sounds. All you can do is toggle the state of the smart phone. If you're trying to run scenes like turning the on to ESPN, or powering all the others all dives off, you need to be able to send the laptop and computer very specific commands. As obvious as this sounds,

a surprising number of new devices do not support Discrete Inputs. They only support Toggles. Additionally, some allow for you to send command over the network. Don't confuse a 'Smart TV' as a that accepts commands over the network. Many 'Smart gadgets' do not. If the doesn't support IP commands, then we want it to support a type of hardwired connection called a serial connection. What we're after is 'two-way' feedback. So the Serial and IP connections allow the relay its status back to the Smart Home. Video Sources have similar issues as. We want to use video sources—e.g. disk players, streaming boxes, game console, servers, etc.—that support IP or serial control wherever possible. And when that's not possible, we want to make sure the control system you've chosen is compatible with the video source. So for example if you have a Blu-ray player that you're excited about, we want to verify it's already in Control4's library of Blu-ray players.

We get questions often about third party drivers (an application written to help a device integrate that isn't natively supported by a company like Control4, and Savant) and the problem with third party drivers is that we're all depending on those third parties to keep the drivers up to date. There are certain applications where we use 3rd party drivers, but normally if there's an option for a natively supported Blu-ray player, we'll chose that over an option with a 3rd party driver [2].

1.3 Objectives

The objectives of this project are centered around enhancing customer service efficiency and optimizing operations within the online smart gadget store. The primary goal is to streamline the reporting process, reducing response times and improving the overall effectiveness of addressing customer queries and complaints. By leveraging data insights gathered through the system, the aim is to gain actionable information into common issues and trends, allowing for proactive measures to enhance service quality and reliability. Additionally, promoting transparency in customer-company interactions is a key objective, achieved through providing real-time updates on the status of reported issues to build trust and confidence among customers. Furthermore, the project seeks to reduce operational costs by implementing automation and optimization measures, thereby improving efficiency and generating cost savings for the company. These objectives collectively serve as a roadmap for achieving improved customer satisfaction and operational excellence within the online smart gadget store

improved customer satisfaction: The system has significantly improved the responsiveness and effectiveness of customer service. Customers can now easily report power-related issues and track the progress of their complaints in real-time, leading to faster resolution of issues and increased satisfaction with the companies' service[3].Increased efficiency: The system has streamlined the gadget shop reporting process, enabling companies to respond to complaints more quickly and efficiently. By automating online shop gadget and prioritization, the system has reduced the workload of personnel and minimized the chances of errors and inaccuracies [4].Data-driven insights: The system provides valuable data and insights that enable companies to identify and address common issues more quickly and proactively. By analyzing the complaints received through the system, companies can gain a better understanding of the root causes of faults and failures in their electrical systems and take measures to prevent future disruptions [5].Transparency: The system provides customers with real-time updates on the status of their complaints, improving transparency and trust in the companies' ability to provide high-quality service [6]. The system has reduced the cost of smart gadget store for companies by automating the reporting and tracking process. This has resulted in cost savings and improved efficiency [7].

1.4 Scope of the study

According to 2020 statistics from the United Nations Educational, Scientific and Cultural Organization (UNESCO), since the start of the COVID-19 pandemic, full or partial school closures have affected approximately 800 million learners worldwide, more than half of the global student population. Schools worldwide have been closed for 14 to 22 weeks on average, equivalent to two thirds of an academic year (UNESCO, 2021). Because of the pandemic, instructors have been compelled to transition to online teaching (Carrillo & Flores, (2020). According to Tang et al. (2020), online learning is among the most effective responses to the COVID-19 pandemic. However, the effectiveness of online learning for young children is limited by their parents' technological literacy in terms of their ability to navigate learning platforms and use the relevant resources. Parents' time availability constitutes another constraint (Dong et al., 2020). Furthermore, a fast and stable Internet connection, as well as access to devices such as desktops, laptops, or tablet computers, definitively affects equity in online education. For example, in 2018, 14% of households in the United States lacked Internet access (Morgan, 2020). In addition, the availability and stability of network connections cannot

be guaranteed in relatively remote areas, including some parts of Australia (Park et al., 2021). In Japan, more than 50% of 3-year-old children and 68% of 6-year-old children used the Internet in their studies, but only 21% of households in Thailand have computer equipment (Park et al., 2021)[8].

1.5 Organization of the project

Online Retail Sector: The e-commerce website could be implemented within the online retail sector, catering to various consumer needs such as electronics, clothing, groceries, etc. Its implementation in this sector would provide a platform for customers to browse, select, and purchase products conveniently from the comfort of their homes. Global Market Access: With the increasing trend of online shopping globally, the system could be implemented to target a wide range of audiences across different geographical locations. This would make the platform accessible to consumers worldwide, thereby enhancing its reach and potential customer base. Mobile Compatibility: Given the growing usage of smartphones for online activities, ensuring the system's compatibility with mobile devices is essential.[9] Implementing responsive design principles would make the website accessible and user-friendly across various screen sizes, enhancing its suitability for mobile users. User-Friendly Interface: Implementing intuitive navigation and user-friendly interfaces is vital for enhancing the overall user experience. By prioritizing ease of use and accessibility, the system can cater to a diverse range of users, including those with limited technological literacy. Secure Payment Gateway: Implementing robust security measures, particularly in the payment processing system, is crucial to instill trust and confidence among users. Integration with secure payment gateways and adherence to industry standards for data protection would enhance the system's suitability for conducting secure online transactions. Scalability and Performance: As the e-commerce website grows [10], ensuring scalability and performance is essential to accommodate increasing user traffic and transaction volumes. Implementing scalable infrastructure and regularly optimizing performance would ensure a seamless shopping experience for users, thereby enhancing the system's suitability for handling growth. By implementing the e-commerce website within the context of these considerations, it can effectively meet the needs and expectations of both consumers and businesses in the online retail sector, making it a valuable and suitable platform in real-life scenery.

CHAPTER 2
LITERURURE REVIEW

The literature surrounding e-commerce websites provides valuable insights into their design, functionality, and impact on consumer behavior and business operations. Research in this field highlights key factors influencing online shopping behavior, technological innovations shaping the e-commerce landscape, challenges faced by online retailers, and opportunities for growth and differentiation. Studies investigating consumer behavior in the context of online shopping emphasize the importance of factors such as perceived usefulness, ease of use, and trust in influencing consumers' attitudes towards e-commerce platforms. Convenience, product assortment, and pricing strategies are also identified as significant determinants of online purchasing decisions. Technological advancements, including mobile commerce, artificial intelligence, and augmented reality, have transformed the way consumers interact with ecommerce websites. Mobile apps, personalized recommendations, and virtual try-on features enhance user engagement and contribute to a seamless online shopping experience. Ensuring the security and trustworthiness of e-commerce platforms is essential for building consumer confidence and fostering long-term relationships. Security measures, privacy policies, and trust-building mechanisms play a crucial role in mitigating risks associated with online transactions.[11] Effective business operations are vital for the success of e-commerce ventures. Supply chain management, inventory control, customer relationship management, and digital marketing strategies are identified as key success factors. Additionally, user generated content, social media marketing, and Omni-channel integration drive traffic and enhance sales on e-commerce platforms. Despite the opportunities presented by e-commerce, challenges such as competition, logistics, regulatory compliance, and technological barriers persist. However, emerging trends such as block chain technology and sustainability initiatives offer new avenues for innovation and differentiation in the e-commerce landscape. The synthesis of literature on e-commerce websites underscores the complex interplay of factors shaping online retailing. By leveraging insights from existing research, the development and implementation of the e-commerce website project can incorporate best practices, address potential pitfalls, and enhance its effectiveness as a user-centric and competitive online platform. Automation are also a significant part of the smart gadget revolution. Virtual

assistants like Amazon's Alexi and Apple's Sire can perform tasks such as setting alarms, playing music, and answering questions. They can also control smart home devices, such as lighting, temperature, and security systems.

However, smart gadgets have also raised concerns about privacy and security. Smart home devices can be vulnerable to hacking, putting our personal information at risk. Virtual assistants, while convenient, can also collect data on our daily lives, raising questions about privacy and surveillance.

2.2 Related Works

With the many millions of users and devices connecting to the network, faster speeds and connectivity and the multiple technological advancements in the architecture next-generation applications which have extremely complex requirements are and will become more the norm and with the many next-generation applications being created new models of business are being created as well. Artificial intelligence and machine learning and many other applications are now taking advantage of the digital transformation which is very much underway and creating new models of business and impacting various industries. Take the music industry for example - Watson BEAT [14] helped create a better soundtrack than an original composition with the help of a cognitive machine. The IBM® Spectrum Computing team asked IBM Watson® Beat to come up with killer beats for its latest Red Bull Racing video—and the AI composer used its neural network to lay down a unique track. Or the Healthcare industry, where applications like Infer vision [15]. Use Artificial Intelligence and Deep learning and work in conjunction with radiologists to diagnose lung cancer faster. Another example of a next-generation application is predictive analytics which involves using advanced analytic techniques that leverage historical data to uncover real-time insights and to predict future events. Predictive analytics can help transform the way a business operates and can be used for many Industrial IoT solutions - using sensor data to predict equipment failure, weather patterns, crop rotation and yield predictions and various other impacts on agriculture and the food industry and many other IoT solutions. [16]Applications such as reinforcement learning have revolutionized the automotive industry with creating autonomous driving cars and the financial services industry with new ways of portfolio management. New next-generation applications and their rapidly evolving used cases and real-life examples are being built everyday - the most successful of which will involve shifting technologies and evolving business models. Mobile applications drive future consumer, Small to Medium Business (SMB) and enterprise application needs. By

2023, 2991 [17] billion mobile applications will be downloaded globally. Social media, gaming and business applications will drive volume. Security analysis users expect their online experience to be always available and always secure—and their personal and business assets to be safe. The last several years have been easily the most eventful period from a security threat perspective, with many serious data breaches that have been discussed widely in the media. Given the scope of the monetary and brand damage associated with data breaches, cyber security is treated as a business risk rather than merely an IT issue. Advances in technology is the main driver for economic growth but has also led to a higher incidence of cyber-attacks. The leading trends such as ecommerce, mobile payments, cloud computing, Big Data and analytics, IoT, AI, machine learning, and social media, all increase cyber risk for users and businesses. Compounding the problem, the nature of the threats is becoming more diverse. The list includes Distributed Denial-of-Service (DDoS), ransom ware, Advanced Persistent Threats (APTs), viruses, worms, malware, spyware, botnets, spam, spoofing, phishing, activism and potential state-sanctioned cyber warfare. There were a total of 1,272 breaches with a total of nearly 163 million records exposed as of the month of November in 2019. The number of records exposed per data breach averaged 128,171 year-to-date in 2019, according to 2019 Identity Theft Resource Center, with the highest number of breaches in the banking category and the healthcare industry experienced the breach of the highest percentage of sensitive records. Average cost of a lost or stolen record continues to increase, according to the IBM Security and Ponemon Institute 2018 Cost of Data Breach Study and it is globally $150 in 2019 compared to an average of $148 in 2018. Cloud and digital transformation increased the total cost of a data breach. Extensive cloud migration, use of mobile platforms, and IoT devices were all significant cost increase drivers. Organizations in the United States had the highest total average cost at $8.19 million, followed by the Middle East at $5.97 million. In contrast, India and Brazilian organizations had the lowest total average cost at $1.83 million and $1.35 million, respectively [18].A Distributed-Denial-of-Service (DDoS) attack occurs when multiple systems flood the bandwidth or resources of a targeted system, usually one or more web servers. Such an attack is often the result of multiple compromised systems flooding the targeted system with traffic. DDoS attacks represent the dominant threat observed by most service providers. Infrastructure outages also continue to be a threat with over half of operators experiencing this issue. Amplification attackers, who have tools for carrying out a DDoS

attack, exploit vulnerabilities in the network and compute resources. Security vendors continue to make sure these attacks are financially unviable for the cybercriminals.

CHAPTER III
METHODOLOGY

A methodology is a formalized process or set of practices for creating website. It is a way to systematically solve a problem. To ensure a project is completed successfully and meets the set deadline a firm plan must be created and followed, therefore it is essential a website development methodology is adopted. （Systems development life cycle，2004）. A website development methodology does not guarantee the success of the project but can improve the chances of the projects success if it is followed properly. Here we discuss about waterfall model.

3.2 Problem Definition

- **User Experience:** Challenges related to the ease of navigation, intuitiveness, and overall satisfaction of users interacting with the website.
- **Website Performance:** Issues affecting the speed, responsiveness, and reliability of the e-commerce platform, which can impact user retention and conversion rates.
- **Security Concerns:** Vulnerabilities that pose a risk to the confidentiality, integrity, and availability of user data, payment information, and other sensitive details.
- **Mobile Responsiveness:** Challenges associated with providing a seamless experience for users accessing the site from various devices, particularly mobile phones and tablets.
- **Inventory Management:** Problems related to tracking, updating, and managing product inventory efficiently to prevent stock outs or overstock situations.
- **Customer Support:** Challenges in providing timely and effective customer support, addressing inquiries, and resolving issues promptly.
- **Scalability**: Concerns related to the ability of the e-commerce platform to handle increasing traffic and growing demands without compromising performance.

3.3 Iterative and Incremental Development Model

Figure 3.1: Agile Model.

Agile Development Methodology (Agile Model), also referred to as the application development life cycle, is a term used in systems engineering, information systems and software engineering to describe a process for planning, creating, testing, and deploying an information system. The Agile Development Mythology concept applies to a range of hardware and software configurations, as a system can be composed of hardware only, software only, or a combination of both. The development process follows a recurring cycle, where each iteration goes through the following phases:

- **Brainstorm:** A brainstorm in the context of e-commerce typically refers to a collaborative session where individuals generate and share ideas for improving or innovating within the realm of online retail. The goal of an e-commerce brainstorming session is to foster creativity, spark new ideas, and ultimately drive growth and success within the online retail space.
- **System Design:** The requirement specifications from first phase are studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture.

- **Development:** The development of e-commerce refers to the evolution and growth of online commerce platforms, technologies, and practices. E-commerce development relies heavily on robust technological infrastructure. This includes secure payment gateways, scalable hosting solutions, and efficient content delivery networks (CDNs) to ensure fast and reliable website performance. The development of user-friendly, Visually appealing websites and mobile apps is essential for e-commerce success. This involves designing intuitive interfaces, optimizing for mobile devices, and implementing features such as product catalogs, search functionality, and checkout processes. Secure and convenient payment processing is crucial for e-commerce transactions. Development in this area involves integrating various payment methods (credit/debit cards, digital wallets, etc.), ensuring PCI compliance for handling sensitive financial information, and implementing fraud prevention measures.
- **Quality Assurance:** Quality assurance in e-commerce refers to the processes and methodologies implemented to ensure that the online shopping experience meets predefined standards of quality, reliability, usability, and security.
- **Deployment of system:** The deployment of e-commerce refers to the process of making the online retail platform accessible to users, typically after development and testing phases are completed.

3.4 System Tools

In this project, we have used the following tools for our system requirement.

Tools:

- Computer hardware
- HTML
- CSS
- Bootstrap
- SQLite
- Operating System: Windows 10/11.
- Database: SQLite.
- Programming Language: HTML, CSS, Python

- Bootstrap
- Framework: Django.
- Editor: visual studio Code (Version 1.85)

For backend we have used python and the front-end coding we have used html, CSS, bootstrap, and for database SQLite

HTML: HTML (Hyper Text Markup Language) version 5, is the latest evolution of the standard markup language used to create and structure content on the World Wide Web. It is a core technology in web development [19], alongside CSS (Cascading Style Sheets) python HTML was first released in a public-facing form on 22 January 2008 with a major update and "W3C Recommendation" status in October 2014[20].

CSS: Cascading Style Sheets is a style sheet language used for specifying the presentation and styling of a document written in a markup language such as HTML [21]. CSS is a cornerstone technology of the World Wide Web, alongside HTML and python.

Bootstrap: Bootstrap is a free and open-source CSS framework directed at responsive, mobile first front-end web development. It contains HTML, CSS and python -based design templates for typography, forms, buttons, navigation, and other interface components [22].

Python: Python is a high-level, general-purpose programming language. Its design philosophy emphasizes code readability with the use of significant indentation. Python is dynamically typed and garbage-collected [23]. It supports multiple programming paradigms, including structured, object-oriented and functional

Django: Django is a free and open-source, Python-based web framework that runs on a web server. It follows the model–template–views architectural pattern. It is maintained by the Django Software Foundation, an independent organization established [24].

SQLite: SQLite is an in-process library that implements a self-contained, server less, zero configuration, transactional SQL database engine. The code for SQLite is in the public domain and is thus free for use for any purpose, commercial or private. SQLite is the most widely deployed database in the world with more applications than we can count, including several high-profile Project [25].

3.5 Design Development

3.5.1 Basic Modules

Module refers to a discrete unit of functionality within a project. It is a way of organizing and structuring a software development project. Each module encapsulates related source files, build settings, and functionalities, allowing for modularity and maintainability in a project. Modules are designed to be independent units that can be developed, tested, and debugged separately, contributing to a more organized and scalable software architecture.

3.5.2 Design Overview

- Login module
- Registration Module
- Admin module

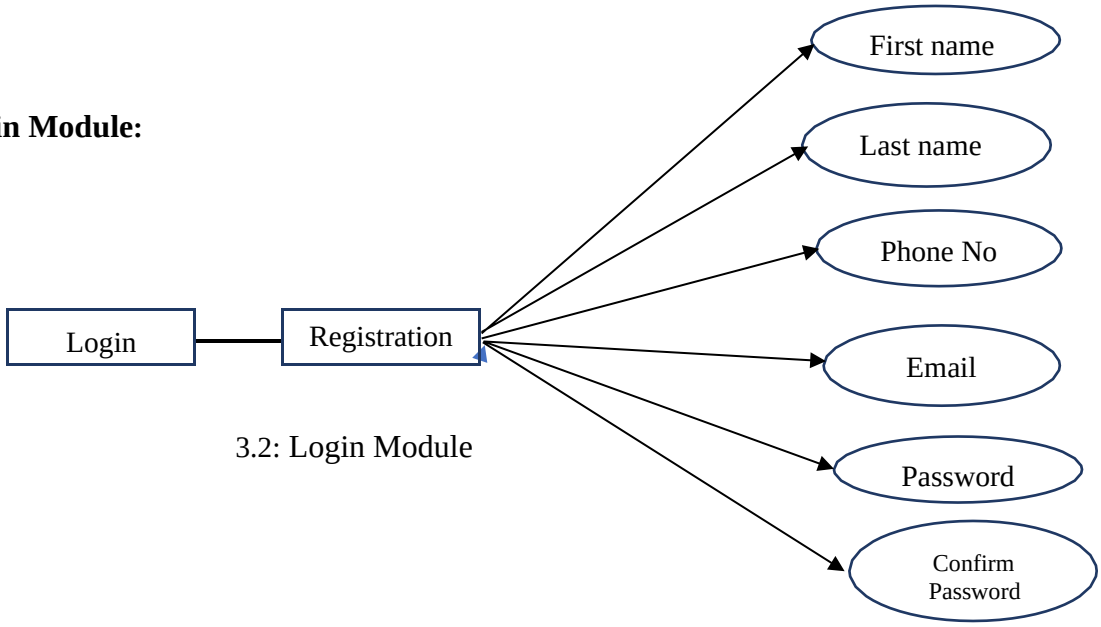
Overall, nine pages were designed in order to meet the aims and objectives of the project. The designs also include what information will be added.

 Login Module: The login module allows registered users to securely access their personalized accounts and engage with the additional features offered through registration. Non-registered users can continue to access the platform's primary functions without any login requirements.

 User Registration Module: While user registration is an option, it is not mandatory for accessing core functionalities. The registration module primarily serves the purpose of creating an online community or society. Registered users gain access to additional features, such as personalized activity feeds, engagement metrics, and the ability to track and showcase their contributions to the bird rescue cause.

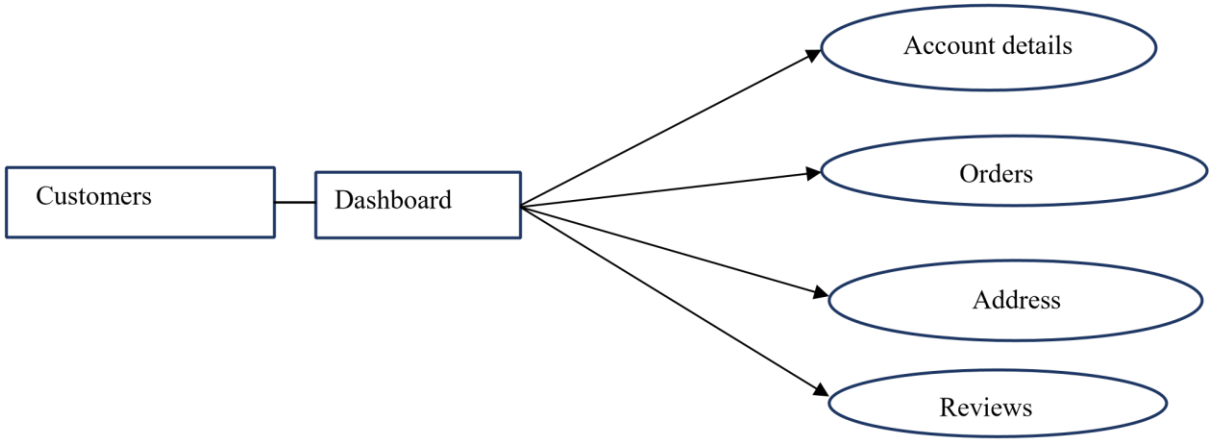
 Admin module: Spring Security provides the admin login. The admin module provides various functionalities. The admin users are responsible for activating and deactivating the employer accounts. In addition, Admin users can view the list of customers registered with the application.

Login Module:



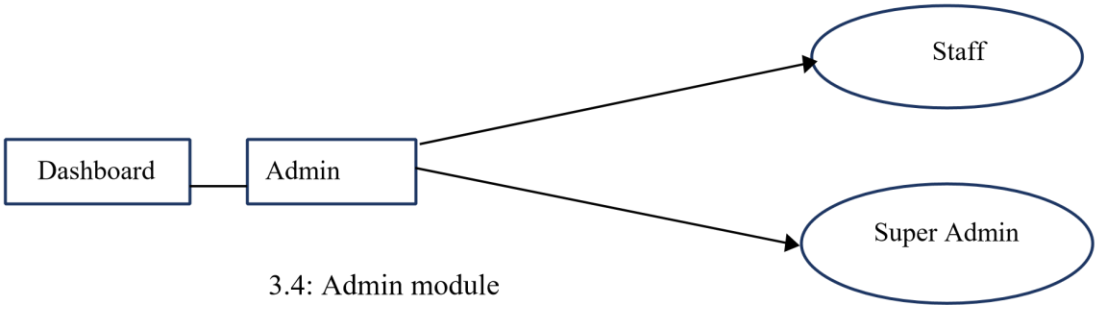
3.2: Login Module

User Registration Module:



3.3 : User registration module

Admin module:



3.4: Admin module

3.5.3 System Design

System design involves the intricate planning and structuring of various components within a system, encompassing its architecture, modules, and elements. This process extends to defining interfaces between these components and managing the flow of data throughout the system. In essence, system design serves as the blueprint that guides the consistent and accurate realization of the envisioned system structure [26].

- **Discovery: All** possible requirements of the system to be developed are captured in this phase and documented in a requirement specification doc.
- **System design:** The requirement specifications from first phase are studied in this phase and system design is prepared. System Design helps in specifying hardware and system requirements and also helps in defining overall system architecture
- **Coding:** With inputs from system design, the system is first developed in small programs called units, which are integrated in the next phase. Each unit is developed and tested for its functionality which is referred to as Unit Testing.
- **Testing:** All the units developed in the implementation phase are integrated into a system after testing of each unit. Post integration the entire system is tested for any faults and failures.
- **Deployment:** Once the functional and non-functional testing is done, the product is deployed in the customer environment or released into the market.
- **Maintenance:** There are some issues which come up in the client environment. To fix those issues patches are released. Also, to enhance the product some better versions are released. Maintenance is done to deliver these changes in the customer environment. All these phases are cascaded to each other in which progress is seen as flowing steadily downwards (like a waterfall) through the phases. The next phase is started only after the defined set of goals are achieved for previous phase and it is signed off, phases do not overlap.

Use case Diagram:

Figure 3.5: Use case diagram

E-R Model

An Entity Relationship model (ER model) describes the structure of a database with the help of a diagram, which is known as Entity Relationship Diagram (ER Diagram). An ER model is a design or blueprint of a database that can later be implemented as a database. ER diagram shows the complete logical structure of a database. An entity can be place, person, object, event or a concept which stores data in database. The characteristics of entities are must have an attribute and a unique key. Every entity is made up of some attributes which represent that entity. An entity is represented using rectangle and an attribute is represented by using eclipse. Let's have a look at simple E-R diagram for Customer Registration, Administration and consumer.

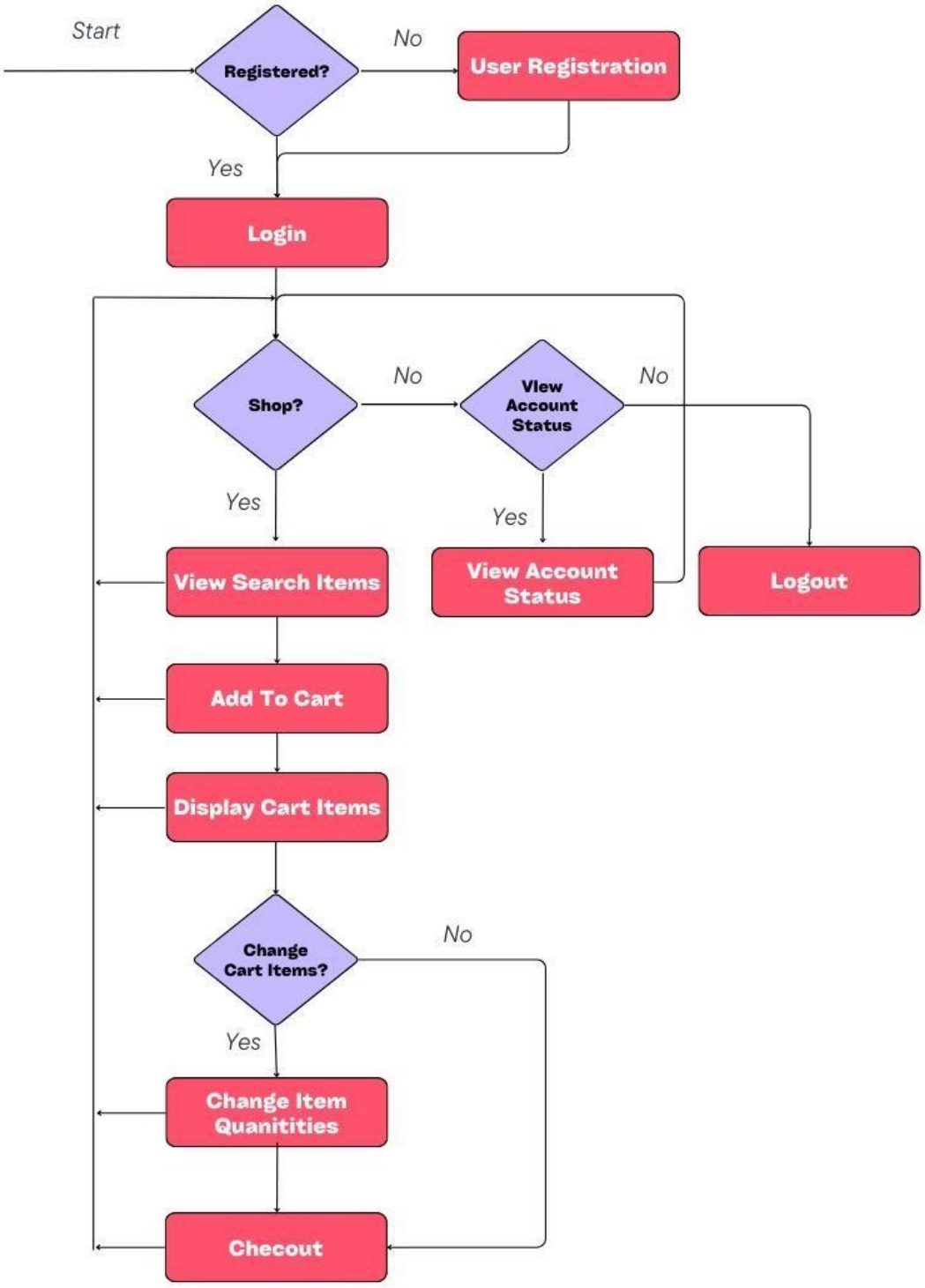


Figure 3.6: E-R diagram Model

3.6 Database Design

Database is critical for all businesses. A good database does not allow any form of anomalies and stores only relevant information in an ordered manner. If a database has anomalies, it is affecting the efficiency and data integrity. For example, delete anomaly arise upon the deletion of a row which also forces other useful data to be lost. As such, the tables need to be normalized. Database files are the key source of information into the system. It is the process of designing database files, which are the key source of information to the system. The files should be properly designed and planned for collection, accumulation, editing and retrieving the required information.

Database Table

Tables are database objects that contain all the data in a database. In tables, data is logically organized in a row-and-column format similar to a spreadsheet. Each row represents a unique record, and each column represents a field in the record.

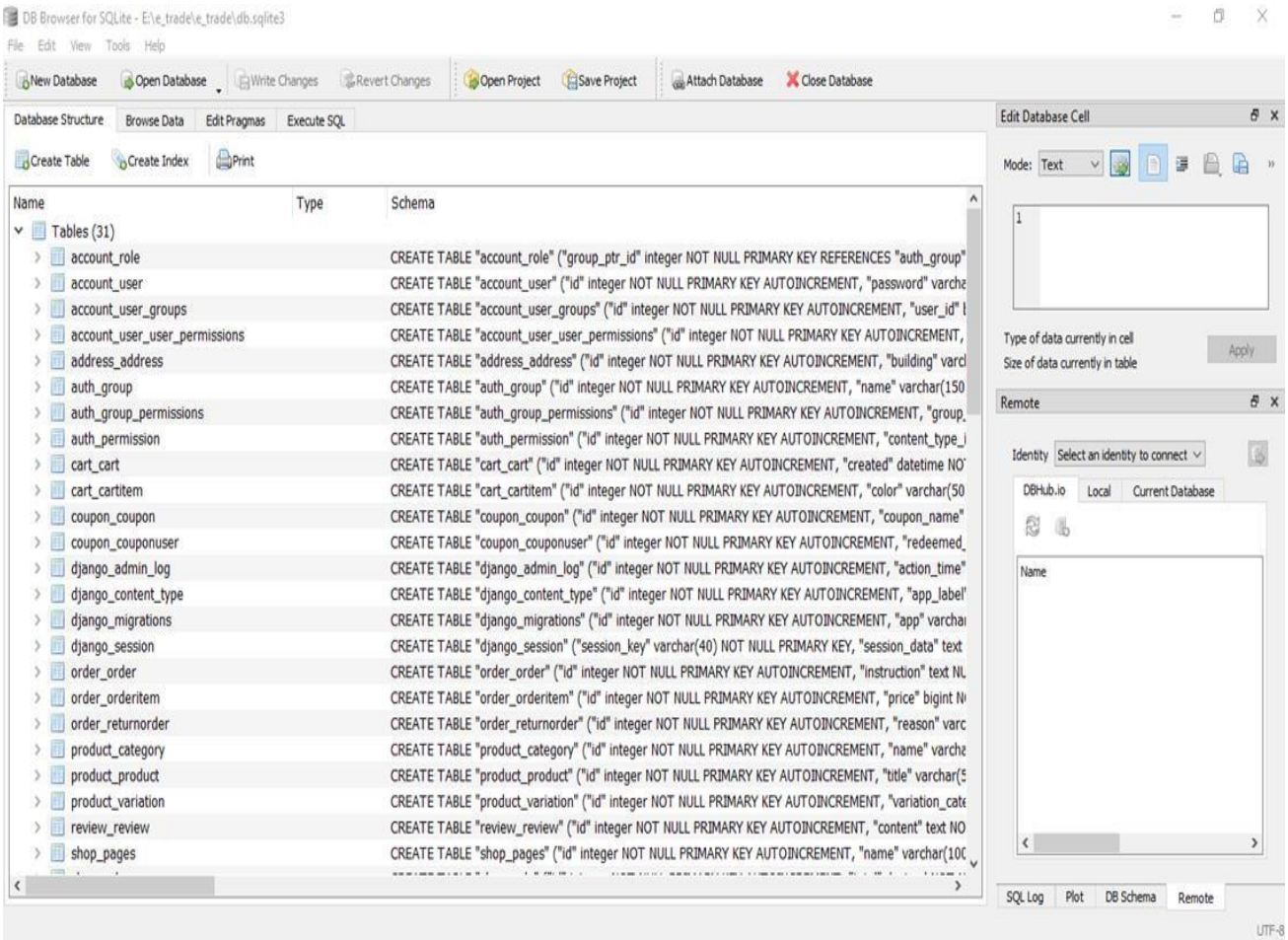


Figure3.7: Database Table

Customer Table

Tables are customer's objects that contain all the data in a customer data. In tables, data is logically organized in a row-and-column format similar to a spreadsheet. Each row represents a unique customer record, and each column represents a field in the record.

		last_login	is_superuser	first_name	last_name	is_staff	is_active	date_joined	username	email	phone
		Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	)xml...	2023-12-10 17:45:01.707158	1	payel	Admin	1	1	2023-08-31 09:49:22	admin@gmail.com	admin@gmail.com	01637699199
2	d1d...	2023-09-15 06:48:21.847682	0	Nesar	Uddin	0	1	2023-09-15 06:47:28.907287		nesar0999@gmail.com	01795121690
3	zDj...	NULL	1	Pavel	Majumder	1	1	2023-10-02 13:40:50	Payel Majumder	Prince.pavel220.pp@gmail.com	
4	owA...	2023-11-24 10:19:00.709943	0	Nesar	Uddin	0	1	2023-11-17 19:09:07.620734		nesar0666@gmail.com	01626864466
5	nUG...	2023-11-18 09:03:16.795188	0	Sumya	Akter	0	1	2023-11-18 09:02:07.561009		sumya601@gmail.com	1245563556
6	:YO9...	NULL	0	Asif	Rahaman	0	1	2023-11-18 10:25:06.006164		wdsafsdadmin@gmail.com	2172067610 1
7	)5dv...	NULL	0	Ruhul	amin	0	1	2023-11-19 04:45:21.145590		ruhulamin@gmail.com	01302287642
8	0fU...	2023-11-19 11:22:25.595070	0	shagor	islam	0	1	2023-11-19 06:58:57.200981		emonchowdhury494@gmail.com	5442067610 1
9	4ct6S...	NULL	0	Zahirul Islam	Chowdhury	0	1	2023-11-19 07:06:44.143662		asifurradsahamannub66@gmail.com	0172067610 1
10	KKU...	NULL	0	shagor	islam	0	1	2023-11-19 07:12:39.944349		binimaoyinternational07@yahoo.com	01438043376
11	K6U...	NULL	0	shagor	islam	0	1	2023-11-19 07:23:21.739659		asifurrasashamannub66@gmail.com	0272067610 1
12	qIEZ...	NULL	0	shagor	islam	0	1	2023-11-19 07:29:10.756571		12binimoyinternational07@yahoo.com	0172067610 2
13	'peM...	NULL	0	shagor	islam	0	1	2023-11-19 07:37:25.538909		emon2chowdhury494@gmail.com	0172067610 3
14	xnN...	NULL	0	shagor	islam	0	1	2023-11-19 07:41:22.280539		emonchosawdhury494@gmail.com	0172067610 5
15	lXyf...	NULL	0	shagor	islam	0	1	2023-11-19 07:42:38.476266		asifurr213ahamannub66@gmail.com	0172067610 9
16	rApp...	NULL	0	Parvez	Khan	0	1	2023-11-24 10:01:33.952828		parvez@gmail.com	01630290910
17	q2H...	NULL	0	Nesar	Uddin	0	1	2023-11-24 10:07:09.948216		near122@gmail.com	01723456789
18	xfAV...	2023-11-24 11:31:37.545305	0	bisty	islam	0	1	2023-11-24 11:27:49.714906		bikash.220@gmail.com	01756900220

Figure 3.8: Customer Table

Category Table

	id	name	slug	image	lft	rght	tree_id	level	parent_id
	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	2	Laptop	laptop	category/best-laptops.webp	1	2	9	0	NULL
2	5	Mouse	mouse	category/2021-Latest-G5-3200DPI-...	1	2	12	0	NULL
3	6	Headphone	headphone	category/pro-audio-k72-01-228x228.jpg	1	2	13	0	NULL
4	7	Keyboard	keyboard	category/...	1	2	14	0	NULL
5	8	Desktop	pc	category/core-...	1	2	15	0	NULL
6	9	Monitor	1000	category/product-image.jpeg	1	2	1	0	NULL
7	10	Graphics card	2000	category/Best-GPUs-for-1080P-...	1	2	2	0	NULL
8	11	Ram	3000	category/memory01.jpg	1	2	3	0	NULL
9	12	Processors	4000	category/cpu.jpg	1	2	4	0	NULL
10	13	Motherboard	5000	category/h470.jpeg	1	2	5	0	NULL
11	14	Power supply	6000	category/ae-strikex-psus-large.jpg	1	2	6	0	NULL
12	16	Laptop Battery	Battery	category/...	1	2	8	0	NULL

Figure 3.9: Category table

Product Data Table list

	id	title	brand	selling_price	offering_price	image	img_second	img_
	Filter	Filter	Filter	Filter	Filter	Filter	Filter	Filter
1	11	Fantech W189	Fantech	550	600	product/fantech-w189-...		
2	13	Lenovo IdeaPad 1 15AMN7 AMD Ryz...	Lenovo	60000	62000	product/...	product/...	product/...
3	14	HP Pavilion 15-eg2109TU Core i5 12t...	HP	93500	96000	product/pavilion-15-...	product/pavilion-15-...	product/pavilion-15-
4	15	Asus VivoBook 14 X415EA Core i3 11...	Asus	56500	58200	product/vivobook-14-x415-...	product/vivobook-14-x415-...	product/vivobook-1
5	16	Asus ExpertBook BR1100FKA Celeron...	Asus	45500	48000	product/expertbook-...	product/expertbook-...	product/expertbook
6	17	MSI GF63 THIN 11UC Core i5 11th Ge...	MSI	116500	117500	product/gf63-thin-11uc-01-500x500.jpg	product/gf63-thin-11uc-03-500x500.jpg	product/gf63-thin-1
7	18	Apple MacBook Air 13.3-Inch Retina ...	Apple MacBook Air	112000	115500	product/macbook-air-13-3-...	product/macbook-mgn73Zp-...	product/macbook-a
8	19	Intel Core i5-10400f 10th Gen Gamin...	Intel	562500	587250	product/core-...		
9	20	AMD Ryzen 7 5800X Gaming Desktop...	AMD	14000	145200	product/ryzen-7-5800x-gaming-...		
10	21	AMD Ryzen 9 5900X Gaming Desktop...	AMD	155000	165000	product/ryzen-9-5900x-gaming-...		
11	22	Walton Avian EX WDPC320G05 Ryze...	Walton	34250	35000	product/avian-ex-...		
12	23	Walton Avian Alpha WDPC320G03 ...	Walton	35000	36500	product/avian-alpha-...		
13	24	Aula S11 RGB Wired Gaming Mouse	Aula	500	600	product/s11-001-500x500.webp	product/s11-003-500x500.webp	product/s11-004-50
14	25	A4tech Bloody L65 Max Honeycomb ...	A4tech	3075	3250	product/bloody-l65-...	product/l65-max-02-500x500.webp	product/l65-max-03
15	26	Astrum MW230 2.4ghz Wireless ...	Astrum	1250	1350	product/...	product/astrum-mw230-...	
16	27	Fantech W603 Go Wireless Mouse	Fantech	425	500	product/w603-go-500x500.webp	product/w603-go-03-500x500.webp	product/w603-go-0
17	28	Meetion MT-R547 2.4G Wireless ...	Meetion	428	525	product/mt-r547-grey-500x500.jpg	product/mt-r547-blue-500x500.jpg	product/mt-r547-re
18	29	Fantech G13 Rhasta II Pro Gaming ...	Fantech	475	550	product/g13-rhasta-ii-...		
19	30	Redragon Capricorn P012 Gaming ...	Redragon	575	600	product/capricorn-p012-1-500x500.jpg	product/capricorn-p012-3-500x500.jpg	
20	31	Redragon PISCES P016 Gaming Mous...	Redragon	425	500	product/pisces-p016-1-500x500.jpg		
21	32	MaxGreen HS04 Laptop Battery For H...	MaxGreen	1550	2000	product/hs04-01-500x500.jpg		
22	33	MaxGreen K42 K52 Laptop Battery Fo...	MaxGreen	1925	2000	product/k42-k52-02-500x500.webp		
23	34	MaxGreen HS04 Laptop Battery For H...	MaxGreen	2100	2250	product/		

Figure 3.10: Product Data Table list.

3.7 Cost and Time Estimation

Our initial setup will be done acquiring free available resources with apache server and MySQL lite database. Python and Django are open source Hardware is pre-owned. To test admin's quicker response to any rescue query, we will implement purchase subscription for which will $20 per year. Hence, $20 in total or around 2200/- BDT based on USD to BD Taka conversion rate during that time. We will hire a couple of volunteers to test the site and its functions on different devices such as smartphone, low-end PC etc. which will cost 2000/- BDT for each and 4000/- BDT in total. So, the total cost of our system development and implementation will be around 2200+ 4000 = 6200/- BDT. Overview of time estimation for our proposed system is given in figure 3.11 below.

Attributes	Nov - Dec (2022)	Jan- Feb (2023)	Mar- Apr (2023)	Jun-July (2023)	Aug -Dec (2023)
Literature Review					
Requirement Analysis and Tool Selection					
Server Environment Ready And Deployment					
Configuration and Performance Tuning					
Report Writing					

Figure 3.11: Overview of Time Estimation

CHAPTER 4
IMPLEMENTATION

Implementation is the realization of an application or execution of a plan, idea, model, design, specification, standard, algorithm or policy. To implement a project means to carry out activities proposed in the application form with the aim to achieve project objectives and deliver results and outputs. In software development it is the part of the process where software engineers actually program the code for the project.

4.2 User Interface

4.2.1 Login Page

A login page is a web page or an entry page to a website that requires user identification and authentication, regularly performed by entering a username and password combination. Logins may provide access to an entire site or part of a website. Logging in not only provides site access for the user, but also allows the website to track user actions and behavior.

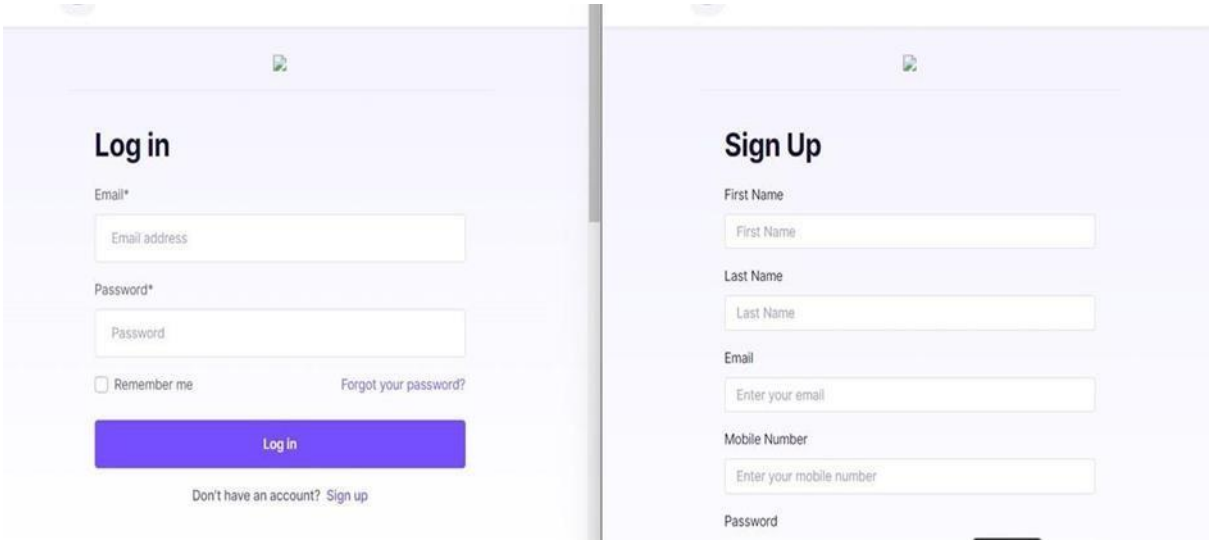


Figure 4.2.1: Login page

4.2.2 Dashboard

Dashboard is usually the one page that the users see first thing in the web application. It is the page that shows the analysis of the application's data, trends, summaries etc. In many cases it dynamically reports important pieces of data from the web application. From the Dashboard the users can drill down to get more information. A dashboard is a visual, at-a-glance representation of key data points. A dashboard should confine its display to a single screen with no need for scrolling or switching among multiple screens, might seem arbitrary and a bit finicky, but it is based on solid and practical rationale.

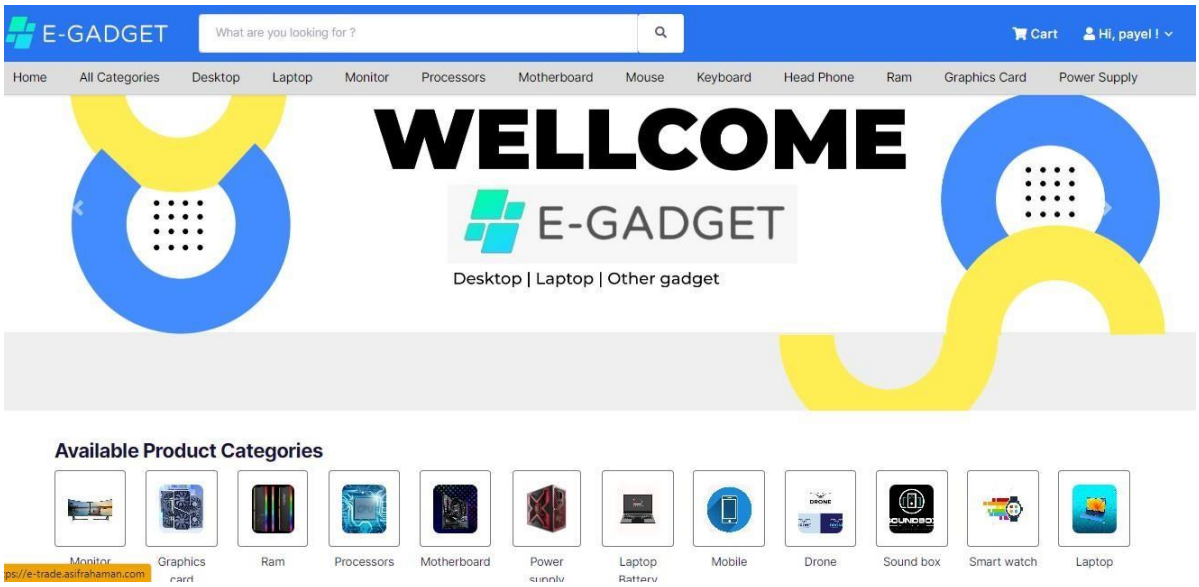


Figure 4.2.2: Customer login dashboard

Manage Categories

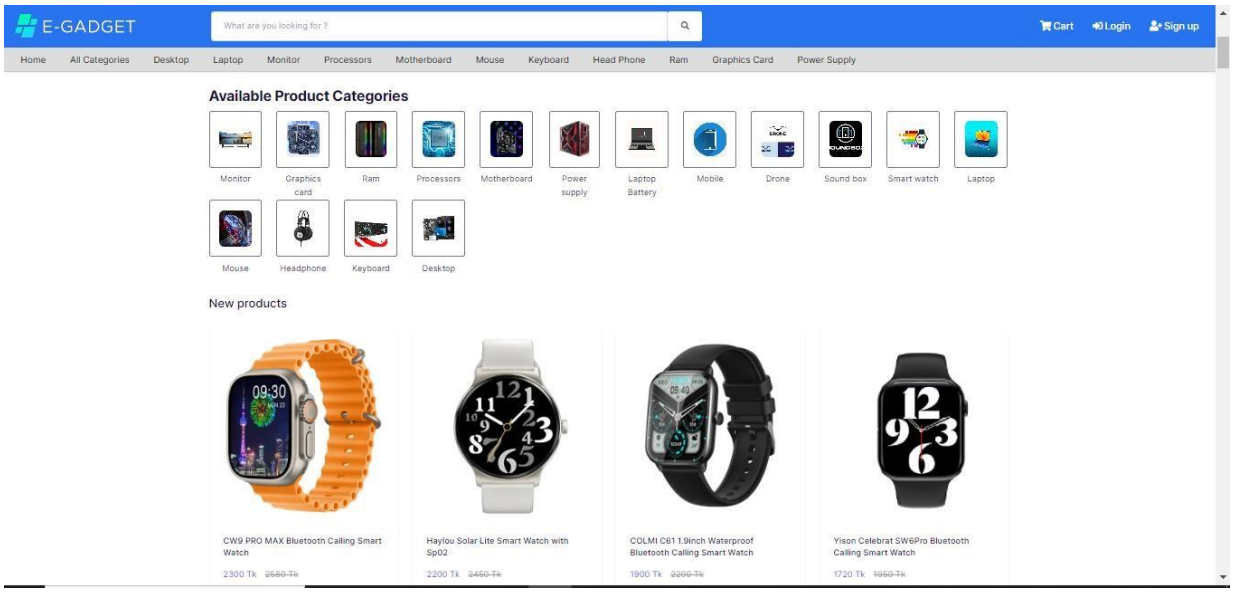


Figure 4.2.3: All categories

Manage Orders

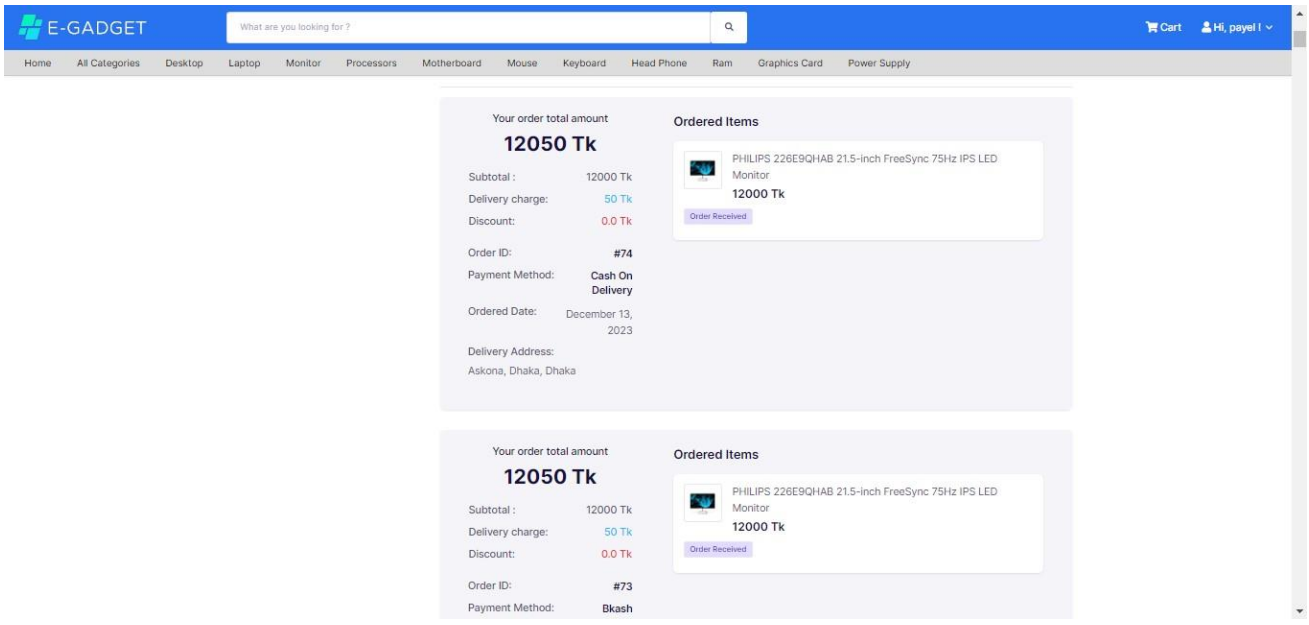


Figure 4.2.4: Customer order

Manage Customer's (General Settings)

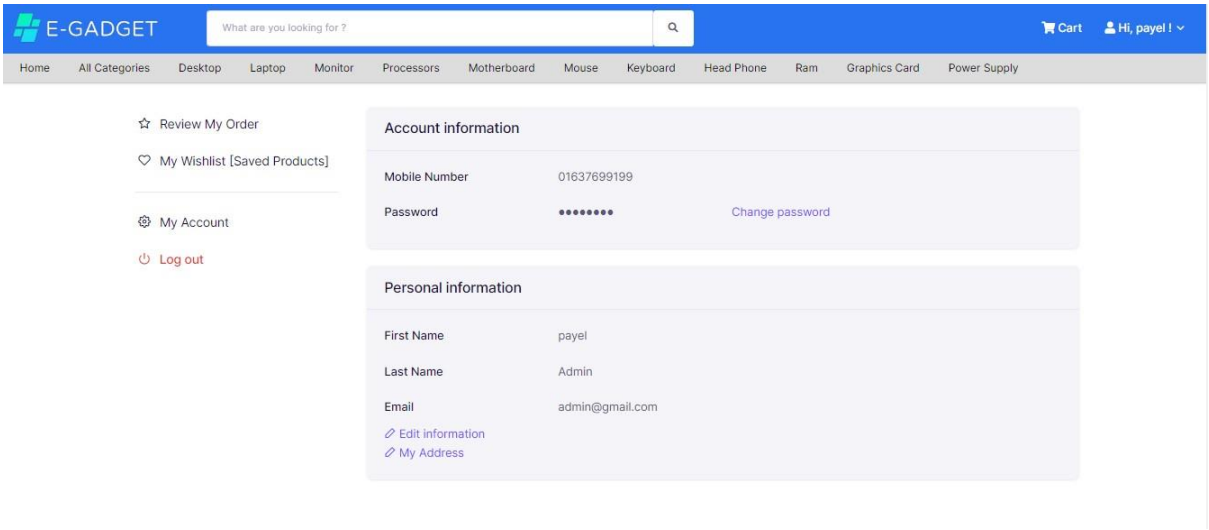


Figure 4.2.5: Customer ID

4.3 Administration Page

Website administration is the process of maintaining a website. This process is done by the website administrator. Website administrators are responsible for running the site after completion. They are registered users who are members of the Administrators role. These users have full access to manage the site including adding, deleting and editing all pages and modules. Administrators also have access to the Admin pages located on the main menu. Admin is the role with the highest level of access to your website. This means that admin can control site-wide settings like the design of your website and the homepage layout. They can add and delete other admin users, and can approve or deny edits made by authors.

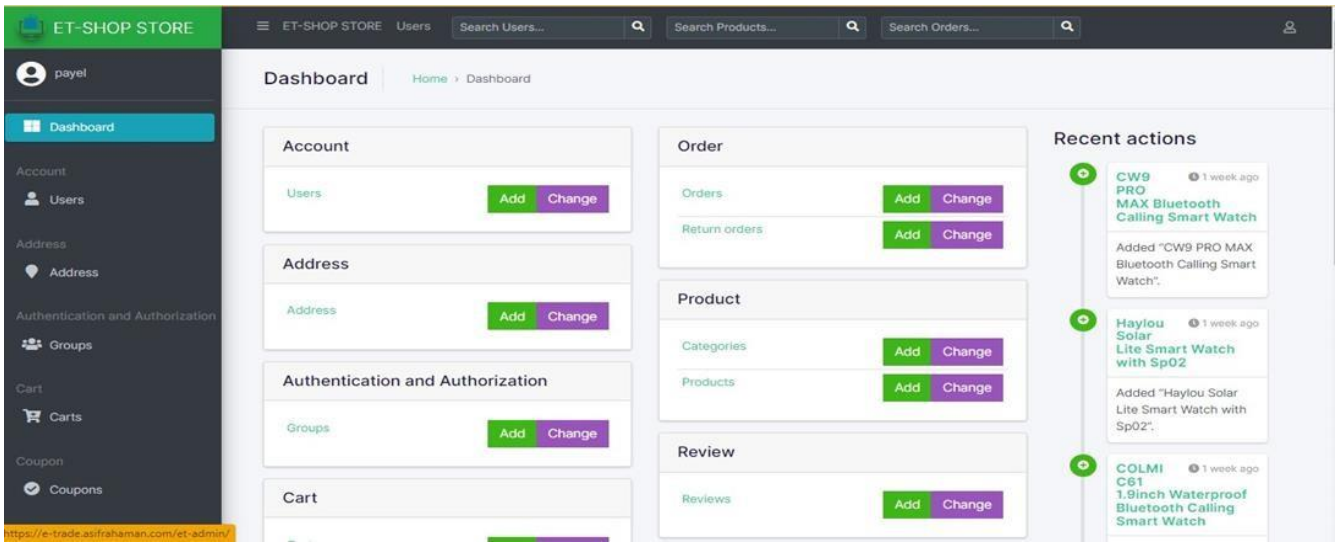


Figure 4.3.1: Login page

4.3.1 User list

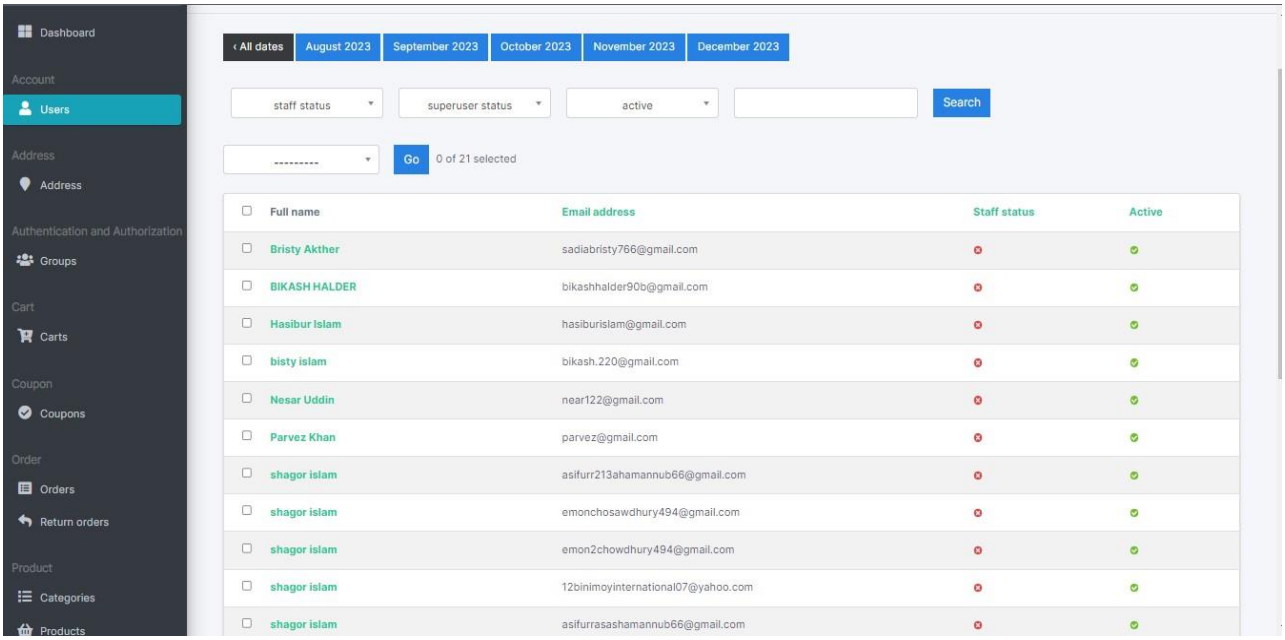


Figure: 4.3.2 User list

4.4 Coding Details and Code Efficiency

The coding is the process of transforming the design of a system into a computer language format. This coding phase of software development is concerned with software translating design specification into the source code. It is necessary to write source code and internal documentation so that conformance of the code to its specification can be easily verified. Coding is done by the coder of programmers who are independent people than the designer. The goal in not to reduce the effort and cost of the coding phase but to cut to the cost of a later stage. The cost of testing and maintenance can be significantly reduced with efficient coding. Code efficiency is a board term used to depict the reliability, speed and programming methodology used in developing codes for an application. The goal of code efficiency is to reduce resource consumption and completion time as much as possible with minimum risk in an operating environment. The software product quality can be accessed and evaluated with the help of efficiency of the code used. Let's see some code samples of our system:

Admin controller code:

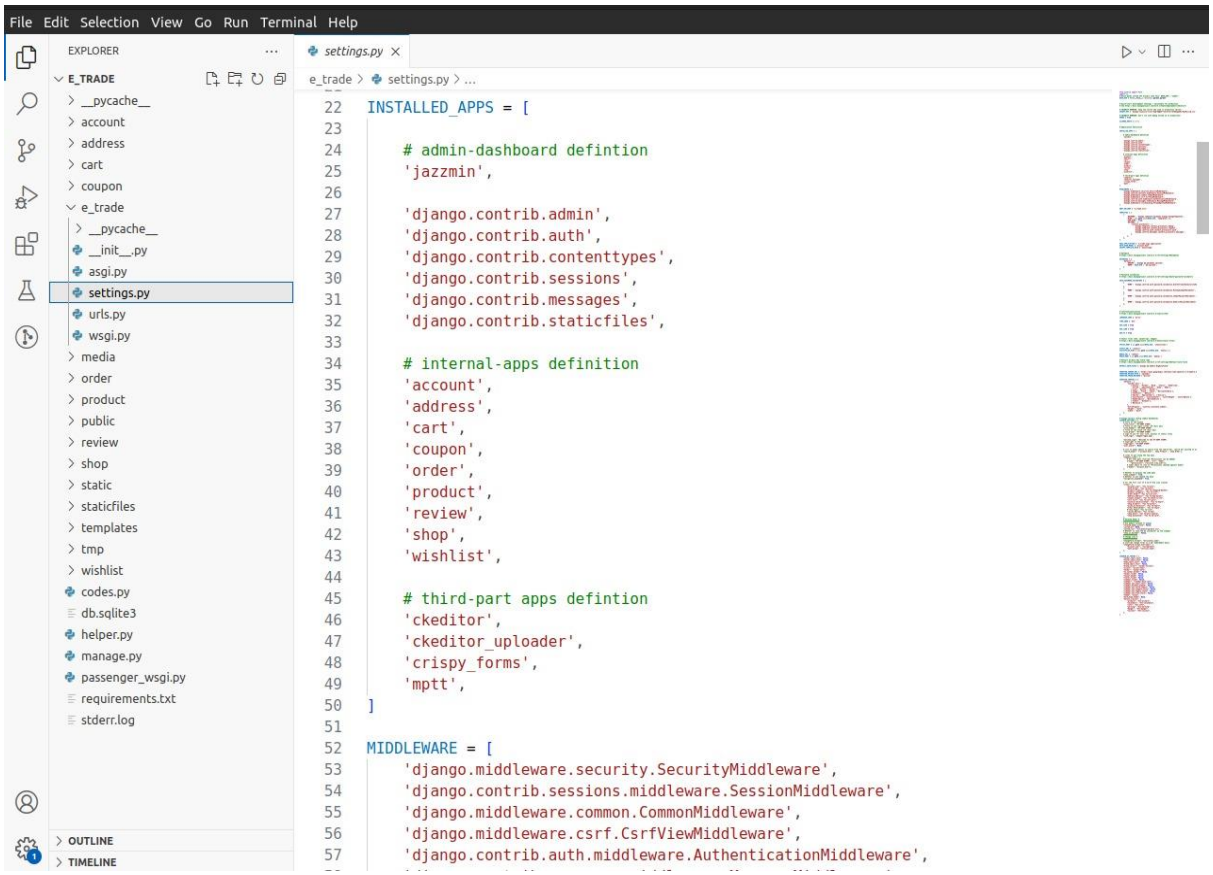


Figure: 4.1 Admin controller code:

Home Page code:

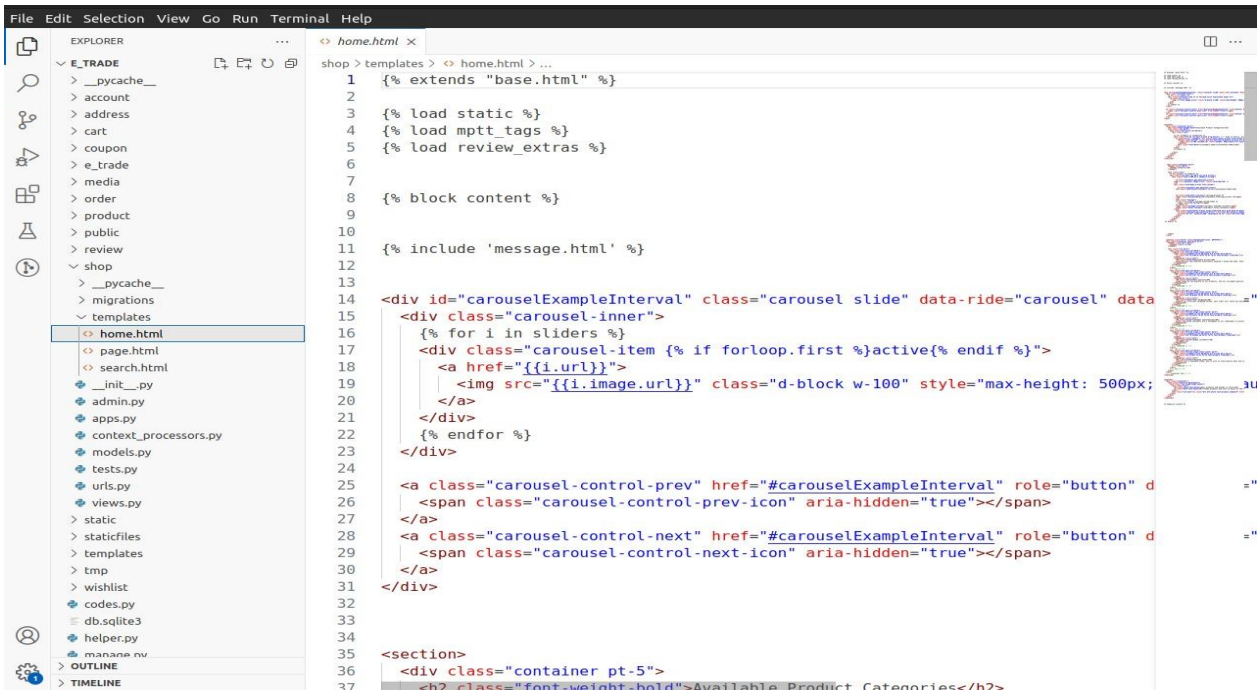


Figure 4.2: home page

Customer registration code:

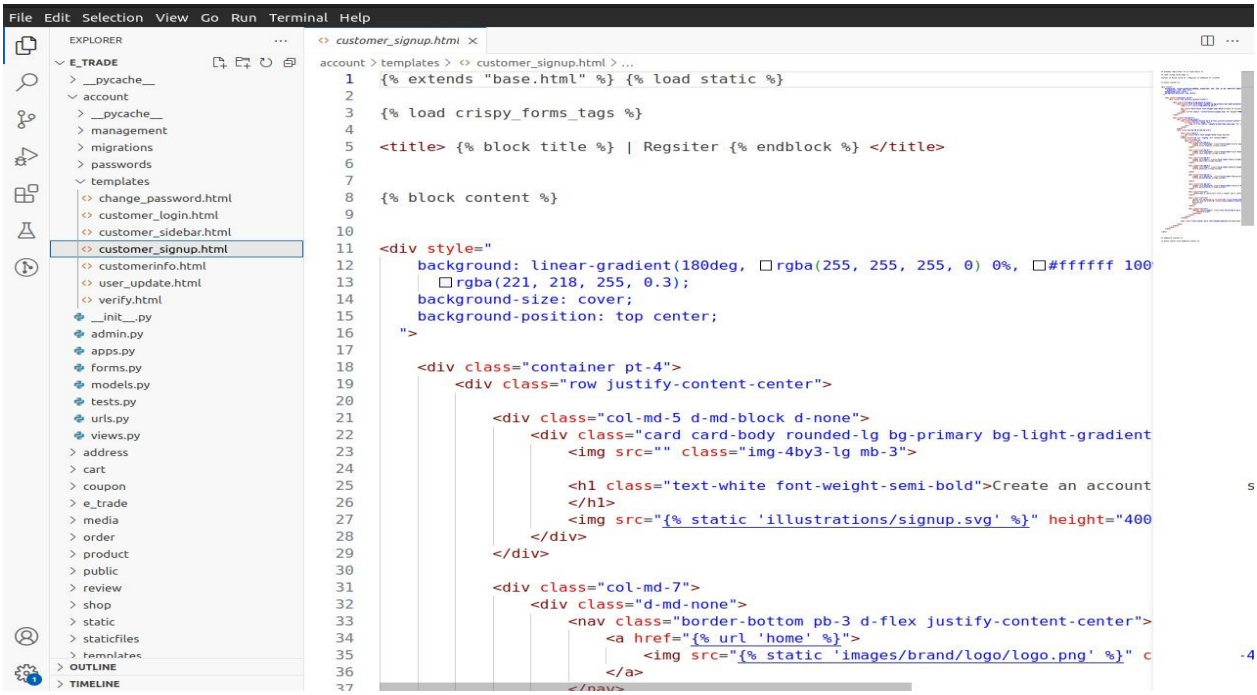


Figure4.3: Customer registration code

Customer Dashboard Code:

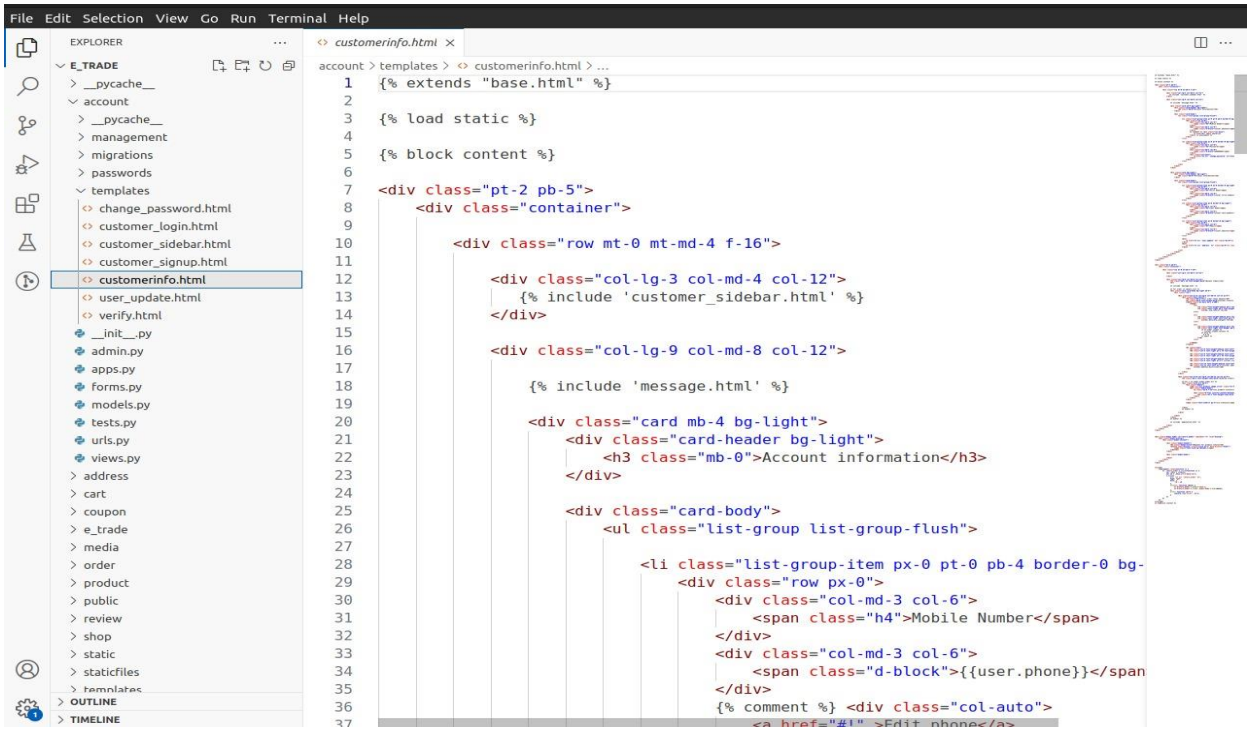


Figure 4.5: Customer dashboard.

Product page code:

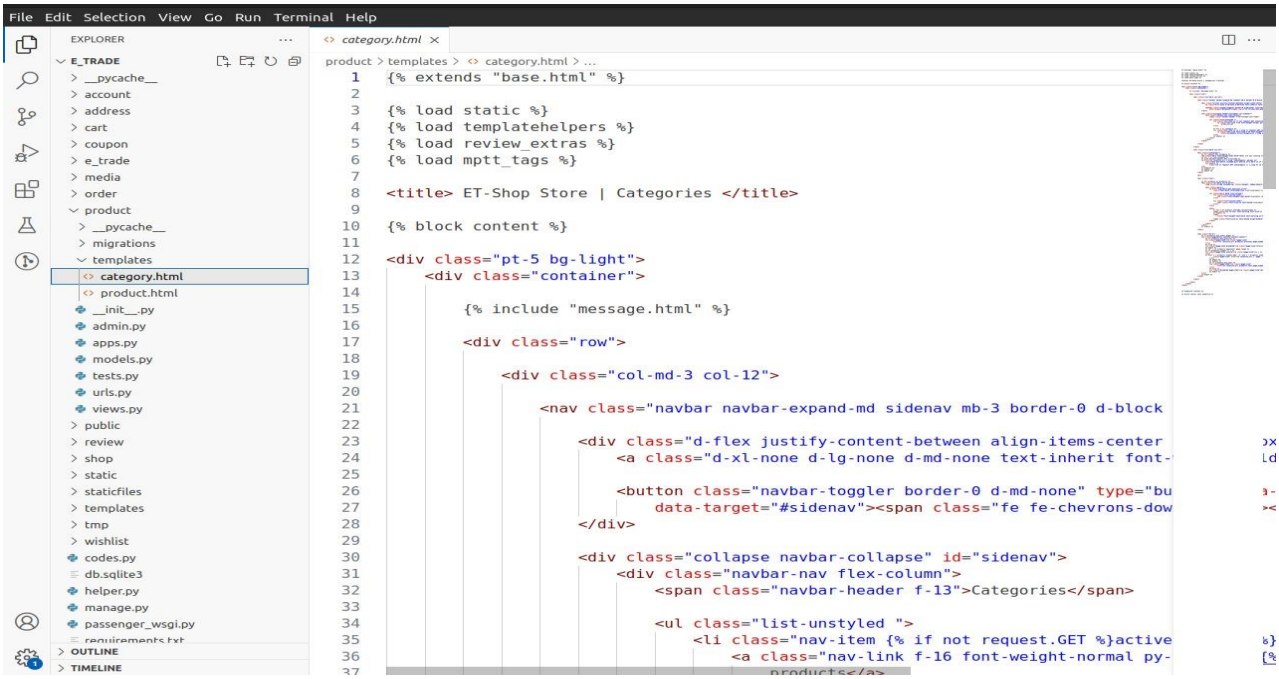


Figure 4.6: Product page code

Customer order page code

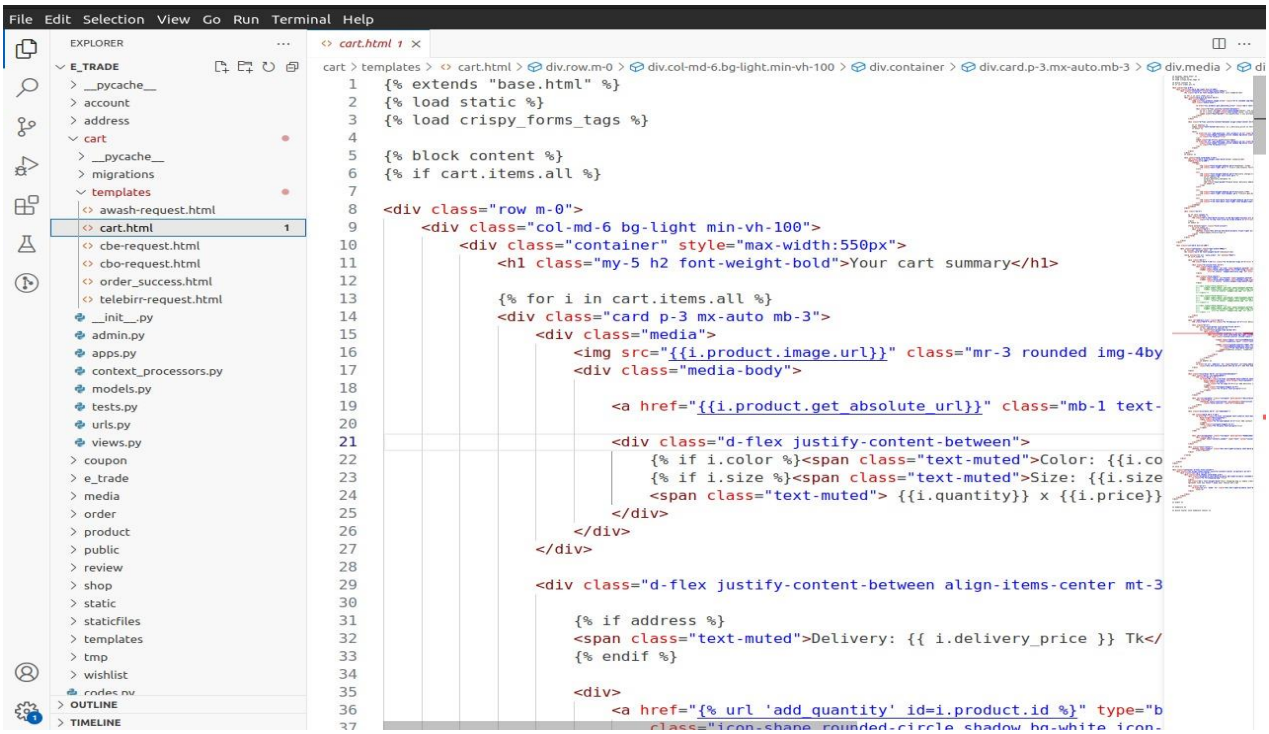


Figure4.7: Customer order page

Customer Order History Page code

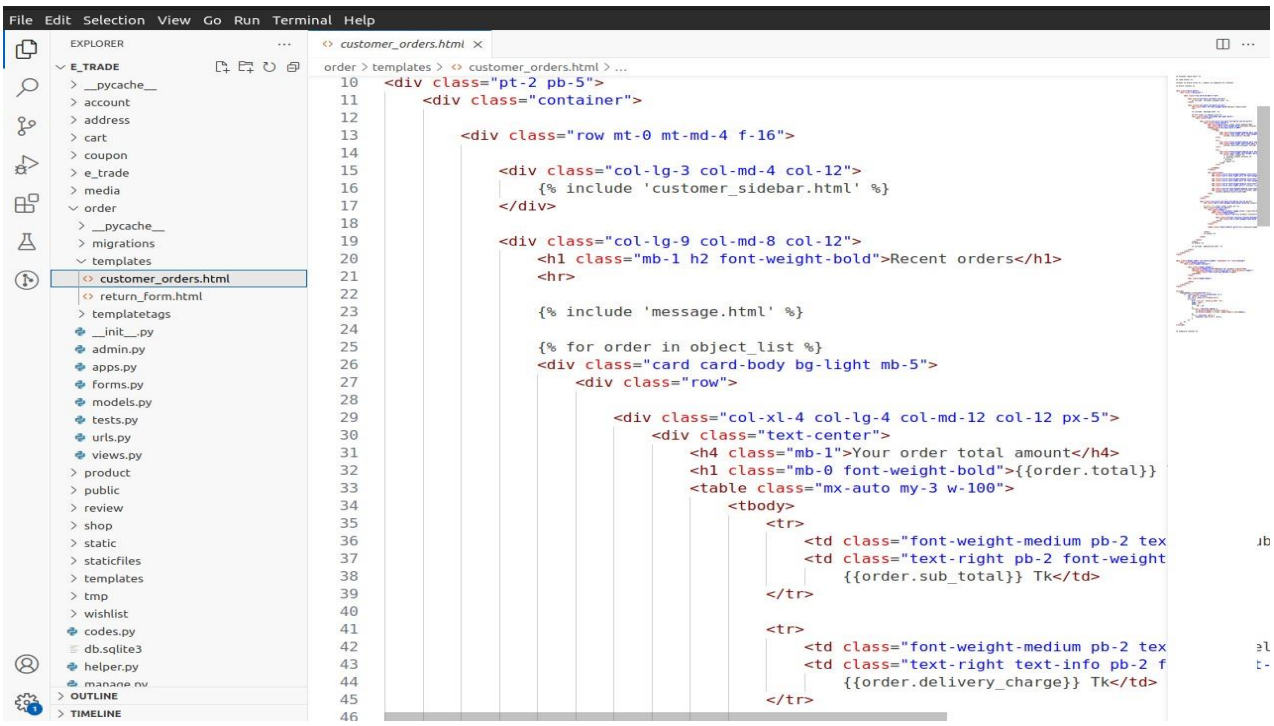


Figure 4.8: Customer Order History Page code

Coupon system page code

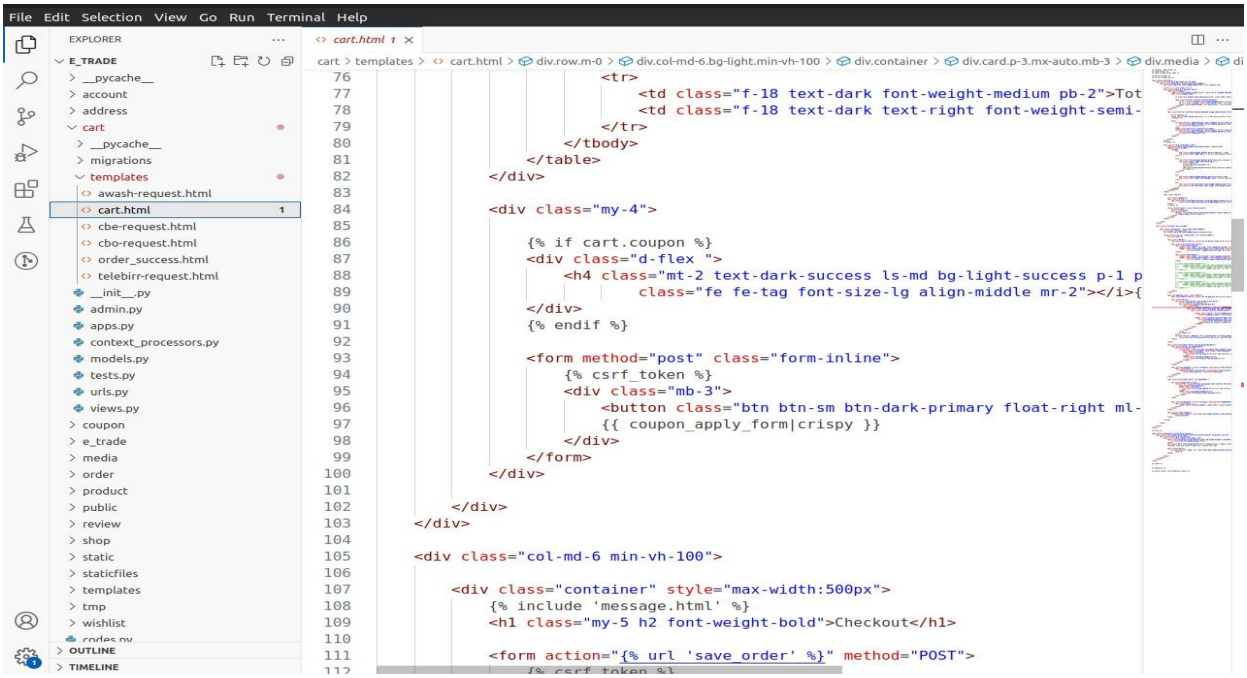


Figure4.9: Coupon System Page Code

Order success page code

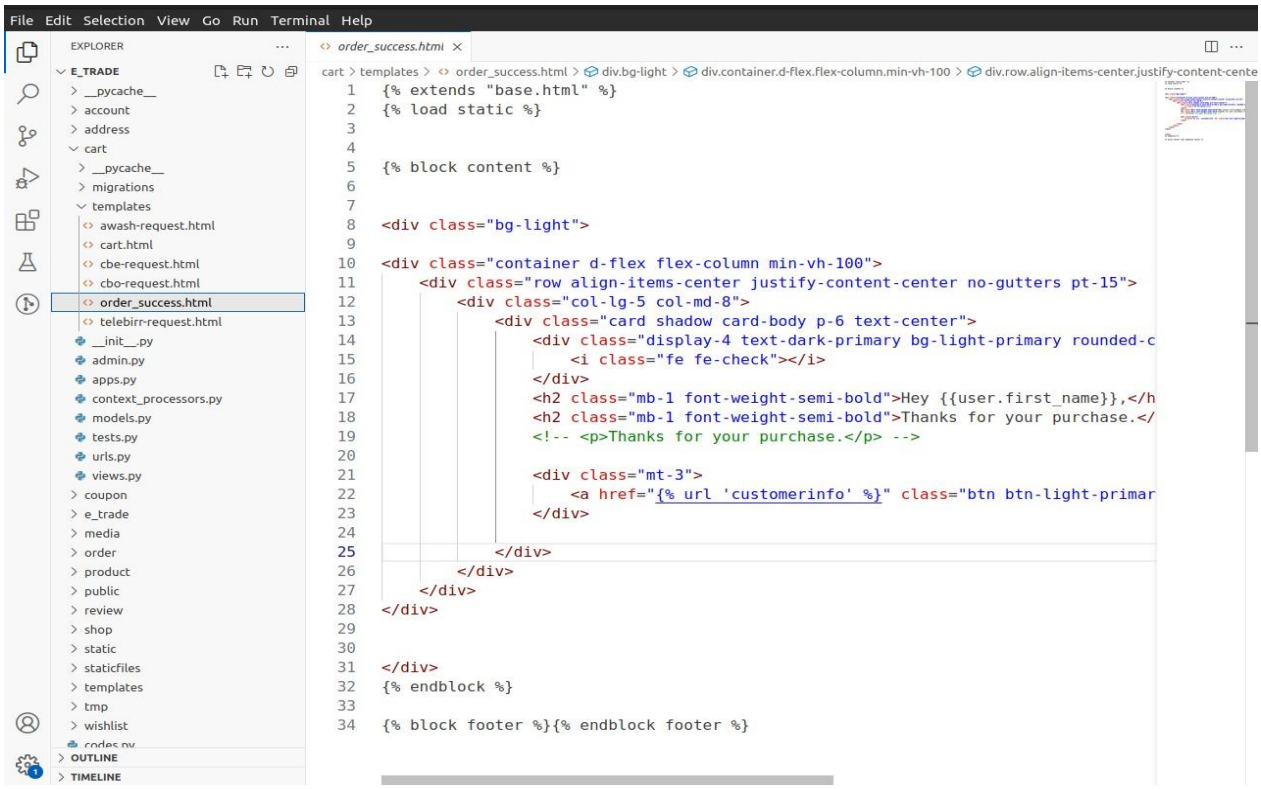


Figure 4.10: order place page

CHAPTER 5
RESULT AND DISCUSSION

Smart gadget store companies are responsible for delivering electricity from power plants to homes and businesses. In this section, we will discuss the results and issues faced by an electricity distribution company. One of the key metrics for measuring the performance of an electricity distribution company is the System Average Interruption Duration Index (SAIDI), which measures the average time that customers are without power per year. The company has been struggling to maintain a low SAIDI score due to frequent power outages caused by aging infrastructure and inclement weather conditions .Another issue faced by the company is poor customer service, as reported by numerous complaints from customers. Customers have experienced long hold times and unhelpful responses when trying to reach customer service representatives. The company needs to improve its customer service to provide a better experience for its customers. In addition, the company has been facing criticism for overbilling customers due to incorrect meter readings. This has resulted in many customers receiving bills that are significantly higher than what they should be paying. The company needs to take steps to address this issue and ensure that customers are billed accurately. To address these issues, the company could invest in upgrading its infrastructure to reduce power outages and improve reliability. Additionally, the company could implement new technologies such as smart meters to improve accuracy in billing and reduce the need for manual meter readings. The company also needs to improve its customer service by hiring more representatives and providing additional training to ensure that customers receive timely and helpful responses.

CHAPTER 6
CONCLUSION AND FUTURE WORK

6.1 Conclusion

Smart gadget store commerce, has become an integral part of the modern global economy, transforming the way businesses operate and consumers engage in commerce. The convenience of shopping online has significantly influenced consumer behavior. Customers can browse, compare, and purchase products or services from the comfort of their homes, leading to increased online transactions. In conclusion, Smart gadget store continues to evolve, driven by technological advancements, changing consumer preferences, and global economic shifts. While it presents numerous opportunities for businesses and consumers alike, addressing challenges and staying adaptable to emerging trends will be essential for sustained success in the ever-evolving landscape of Smart gadget store.

6.2 Future Work

We will modification this software if any need that time. We will add or customer's menus sub menus for any need. Also may be we modification code also. Update this software and release beta version for user satisfaction checking. All good software may have some limitations, this software have some limitations also. We are trying to fix it as per possible. Implementing AR and VR technologies to enhance the online shopping experience by allowing customers to virtually try products before making a purchase. Virtual showrooms or fitting rooms can provide a more immersive and personalized shopping experience Utilizing AI and ML algorithms for personalized product recommendations based on user behavior, preferences, and purchase history. Implementing chatbots for customer support and assistance, providing real-time responses to customer queries. Integrating voice-activated shopping features to allow customers to browse and purchase products using voice commands through smart devices and virtual assistants. Implementing robust cyber security measures to protect

customer data and build trust in online transactions. Staying updated on cyber security trends and continuously adapting security protocols to counter emerging threats.

We also developing a project on e-gadget sounds interesting. Here's a high-level outline of what you might consider including in your future work project:

- **Project Discussion:** Start with a brief overview of the project, explaining what an e-gadget is and what your project aims to achieve. Outline the main features and functionalities you plan to implement
- **Market Research:** Conduct market research to understand the demand for e-gadgets and identify potential competitors. Analyze their strengths and weaknesses to determine how your project can stand out.
- **User Requirement:** Define user stories and gather requirements to understand the needs of your target users. This will help guide the development process and ensure that your project meets user expectations.
- **Design and prototype:** Define user stories and gather requirements to understand the needs of your target users. This will help guide the development process and ensure that your project meets user expectations.
- **Data Base design:** Design the database schema to store information about e-gadgets, users, orders, etc. Consider the relationships between different entities and optimize the database structure for efficiency.
- **Development:** Start implementing the features outlined in your project plan. Break down the work into smaller tasks and use agile methodologies like Scrum or Kanban to manage the development process.
- **Market Launch:** Develop a marketing strategy to promote your e-gadget project. Utilize social media, email marketing, SEO, and other channels to reach your target audience. Plan a launch event to generate excitement and attract users to your platform.

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Appendix - Complex Engineering

Complex Engineering Problem (Ps):

Ps	Attribute	How Ps are addressed through the project	CO	PO
P1	Depth of Knowledge Requirement	The development of the E-gadget online shop demanded a strong foundation in engineering fundamentals (K3) for crafting the Django framework, emphasizing design considerations (K5) and efficient resource allocation through intricate coding (K6). In addition, extensive insights from research literature (K8) were incorporated to enhance the platform's functionality, ensuring a well-informed and robust development process.	**CO1** **CO2**	**PO a** **PO b** **PO c**
P2	Range of Conflicting Requirement	Effectively managing the conflicting demands of ensuring a prompt response to rescue requests while optimizing server resource utilization is a pivotal challenge. Striking a balance between responsiveness and resource efficiency demands a meticulous approach and the implementation of innovative solutions.	**CO1**	**PO a**
P3	Depth of Analysis Required	Addressing issues related to database integration, ensuring seamless communication between different modules, and optimizing the platform's performance were paramount. Indepth analysis was indispensable to identify and resolve coding intricacies, debug software components, and ensure the robustness of the overall system.	**CO2** **CO3** **CO4**	**PO b** **PO c** **PO d** **PO g**
P7	Interdependence	The engineering intricacies within the E-gadget online shop manifest in the coordination of subsystems devoted to data management, user engagement, and educational content delivery. Achieving a seamless integration of these components is vital for the platform's effectiveness.	**CO3** **CO5** **CO6**	**PO i** **PO k** **PO j**

Knowledge Profile (K)	Short Name
K1	Natural Sciences
K2	Mathematics
K3	Engineering Fundamentals
K4	Specialist Knowledge
K5	Engineering Design
K6	Engineering Practice
K7	Comprehension
K8	Research Literature

As	Attribute	How As are addressed through the project
A1	Range of resources	Creating and managing an ecommerce business requires a range of resources to cover various aspects such as website development, product sourcing, marketing, customer service, and more. Here's a breakdown of essential resources you might need.
A2	Level of interaction	The level of interaction in ecommerce refers to the degree of engagement and communication between users (customers) and the ecommerce platform or website. It encompasses various aspects of user interaction, including browsing, searching for products, making purchases, providing feedback, and seeking assistance or support. Here are different levels of interaction commonly seen in ecommerce. The level of interaction in ecommerce can significantly impact user satisfaction, loyalty, and overall success of the platform. Ecommerce businesses often strive to enhance user engagement and interaction to create a more immersive and personalized shopping experience for their customers. Interaction commonly seen in ecommerce.
A4	Consequence for society and the environment	Ecommerce has significant consequences for both society and the environment, affecting various aspects of daily life and ecological systems. Here are some key consequences. Addressing the consequences of ecommerce requires a multifaceted approach involving stakeholders from government, industry, civil society, and consumers. Strategies such as sustainable sourcing, green logistics, responsible consumption, and equitable access to digital technologies can help mitigate negative impacts and promote a more sustainable and inclusive ecommerce ecosystem.
A5	Familiarity	The familiarity with ecommerce refers to how well individuals understand and interact with online platforms for buying and selling goods and services. Here's how familiarity with ecommerce can impact various aspects. Overall, familiarity with ecommerce plays a crucial role in shaping consumer behaviour, business strategies, digital literacy, trust in online transactions, and the broader economic landscape. Efforts to improve familiarity with ecommerce should focus on enhancing digital skills, promoting online safety and security, and ensuring equitable access to digital technologies and opportunities.