CONSUMER-TO-CONSUMER PRODUCT TRADING & EXCHANGING WITH BLOCKCHAIN IMPLEMENTATION

Submitted in partial fulfillment of the
requirements for the award of
Bachelor of Engineering degree in Computer Science and Engineering

By

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INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)
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APRIL - 2023

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BONAFIDE CERTIFICATE

This is to certify that this Project Report is the bonafide work of **Kumar Aditya (39110544) and Sumit Kumar (39110983)** who carried out the Project Phase-2 entitled **"CONSUMER-TO-CONSUMER PRODUCT TRADING & EXCHANGING WITH BLOCKCHAIN IMPLEMENTATION"** under my supervision from Jan 2023 to April 2023.

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DECLARATION

I, **KUMAR ADITYA(Reg.No- 39110544),** hereby declare that the Project Phase-2 Report entitled **"CONSUMER -TO- CONSUMER PRODUCT TRADING & EXCHANGING WITH BLOCKCHAIN IMPLEMENTATION"** done by me under the guidance of **Dr. T JUDGI, M.E., Ph.D.,** is submitted in partial fulfillment of the requirements for the award of Bachelor of Engineering degree in **Computer Science and Engineering**.

DATE: 24-04-2023

PLACE: Chennai **SIGNATURE OF THE CANDIDATE**

ACKNOWLEDGEMENT

I am pleased to acknowledge my sincere thanks to **Board of Management** of **SATHYABAMA** for their kind encouragement in doing this project and for completing it successfully. I am grateful to them.

I convey my thanks to **Dr. T.Sasikala M.E., Ph.D.**, **Dean**, School of Computing, **Dr. L. Lakshmanan M.E., Ph.D.,** Head of the Department of Computer Science and Engineering for providing me necessary support and details at the right time during the progressive reviews.

I would like to express my sincere and deep sense of gratitude to my Project Guide **Dr.T JUDGI, M.E., Ph.D.,** for her valuable guidance, suggestions and constant encouragement paved way for the successful completion of my phase-2 project work.

I wish to express my thanks to all Teaching and Non-teaching staff members of the **Department of Computer Science and Engineering** who were helpful in many ways for the completion of the project.

ABSTRACT

Technological advancements have led to an increase in the popularity of consumer-to-consumer product trading (C2CPT). How C2C-PT affects the manufacturer (called the “firm”) and consumers in the market are unclear. We, therefore, build analytical models to explore this problem. We consider a case in which a firm develops and sells a product to consumers in the market. Consumers possess heterogeneous random valuations of the product and are strategic in the sense that they are forward-looking utility maximizers. The firm makes the optimal decision on the product selling price. We study the impacts of C2C-PT on both the firm and consumers. We identify the optimal purchasing decision for the consumers and establish the optimal pricing policy for the firm. We show that the presence of C2C-PT may either benefit or hurt the firm and consumers, while the consumer’s strategic behavior will always bring harm to the firm. Most interestingly, we prove that strategic purchasing behavior is not always beneficial to consumers themselves.Consumer to consumer (C2C) product exchanging and buying is a type of direct exchange between individuals without the involvement of a business or intermediary. This exchange mostly takes place through online marketplaces, classified ads, or social media platforms. C2C marketplaces provide a wide range of products and offer a convenient and affordable way for individuals to buy and sell goods. However, buyers and sellers need to take precautions to ensure a safe and successful transaction. It is important to review product descriptions, photos, and seller's feedback ratings before making a purchase. Additionally, using secure payment options and conducting transactions through reputable platforms can help protect against fraudulent activity.

Keywords: Consumer-to-Consumer Product Trading, Consumer Behavior

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LIST OF ABBREVIATIONS

S.No	ABBREVIATION	EXPANSION
1.	C2C	Consumer to Consumer
2.	DB	Database
3.	DBC	Database Confidentiality
4.	JSP	Java Server Page
5.	JVM	Java Virtual Machine
6.	MDA	Medical Admin
7.	SMC	Secure Multiparty Computation

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

The sharing economy has recently grown dramatically and has led to changes in manufacturing and supply chain operations. Technological advances and also the increasing popularity of mobile devices and apps have led to the establishment of various platforms, like Airbnb, Uber, and eBay. These platforms offer various sharing economy services, which might be free or paid, or operate through bartering and exchanging goods and services. The sharing economy has permeated many aspects of our daily lives, and includes the sharing of homes, rides, clothes, books, toys, and digital products. according to statista.com, about 44.8 million adults used sharing economy services within the US in 2016, and this figure was forecasted to extend to 86.5 million by 2021.1 Consumer-to-consumer product trading, a variety of sharing economy, is becoming increasingly popular. Increased Internet and smartphone usage has enabled people to interact in C2C-PT activities with friends, relatives, neighbors, and others worldwide. We consider a case in which a firm develops and sells a product to consumers in the market.Consumers possess heterogeneous random valuations of the product and are strategic in the sense that they are forward-looking utility maximizers. The firm makes the optimal decision on the product selling price. We study the impacts of C2C-PT on both the firm and consumers. We identify the optimal purchasing decision for the consumers and establish the optimal pricing policy for the firm. We show that the presence of C2C-PT may either benefit or hurt the firm and consumers, while the consumer's strategic behavior will always bring harm to the firm. Most interestingly, we prove that strategic purchasing behavior is not always beneficial to consumers themselves. C2CPT is a type of e-commerce where consumers buy, sell, or exchange products with other consumers online.This type of transaction usually takes place on online marketplaces or auction sites.C2CPT involves a wide range of products, from secondhand goods to handmade crafts and services.In a C2C transaction, the seller is usually an individual who is not a professional retailer, and the buyer is also a consumer looking for a product.C2C trading has become popular due to the ease of use and convenience of online marketplaces.C2C trading allows consumers to sell items they no longer need or want, while also providing an opportunity for others to find unique products at a lower cost than traditional retail stores. C2CPT or Consumer-to-consumer product trading and exchanging is a form of e-commerce that involves consumers buying, selling, or exchanging products with other consumers online. It is typically done on online marketplaces or auction sites, and can involve a variety of products, from secondhand goods to handmade crafts and services. While C2C trading offers convenience and affordability, there are also potential risks associated with it, such as fraud and misrepresentation. As a result, consumers should exercise caution and research the seller and product thoroughly before making a purchase. C2C transactions can involve a wide range of products, from secondhand goods to handmade crafts and services. In a C2C transaction, the seller is usually an individual who is not a professional retailer, and the buyer is also a consumer looking for a product.

C2C trading has become popular in recent years due to the ease of use and convenience of online marketplaces.It allows consumers to sell items they no longer need or want, while also providing an opportunity for others to find unique products at a lower cost than traditional retail stores.It is a form of e-commerce that involves consumers buying, selling, or exchanging products with other consumers online. It is typically done on online marketplaces or auction sites and can include a variety of products, from secondhand goods to handmade crafts and services. While C2CPT can offer convenience and affordability, there are also potential risks associated with it, such as fraud and misrepresentation. Therefore, it is essential for consumers to be cautious and research the seller and product thoroughly before making a purchase. This type of transaction typically takes place on online marketplaces or auction sites, such as eBay or Craigslist, and can involve a wide range of products, from secondhand goods to handmade crafts and services. While C2CPT provides a convenient and affordable way for consumers to sell and buy products, there are also potential risks associated with it, such as fraud and misrepresentation. Therefore, it's important for consumers to exercise caution and research the seller and product before making a purchase. It has become popular due to the convenience and affordability of online marketplaces, which allow individuals to sell their products without the overhead costs associated with operating a traditional retail store. However, there are potential risks such as fraud and misrepresentation, so buyers and sellers should exercise caution and research thoroughly before making a transaction.

However, there are also potential risks associated with C2C trading, such as fraud, scams, and the possibility of receiving defective or misrepresented products.To minimize these risks, consumers should exercise caution and thoroughly research the seller and product before making a purchase.Online marketplaces usually offer measures to protect both buyers and sellers in C2C transactions, such as ratings, reviews, and dispute resolution systems.

Overall, C2CPT is a convenient way for consumers to buy, sell, or exchange products with each other, but caution should be exercised to avoid potential risks. C2CPT, is a type of e-commerce where individuals buy, sell, or exchange products with other individuals through online marketplaces or auction sites. This type of trading allows consumers to sell products they no longer need or want, while providing others the opportunity to purchase unique items at a lower cost. C2CPT transactions can involve a wide range of products, from secondhand goods to handmade crafts and services. However, there are potential risks associated with C2CPT, such as fraud, scams, and receiving defective or misrepresented products, so it is essential for buyers and sellers to exercise caution and conduct thorough research before making a transaction. Despite these risks, C2CPT has become increasingly popular due to its convenience, affordability, and ability to connect individuals across geographic locations. C2CPT gives a helpful and reasonable way for customers to sell and purchase items, there are likewise potential dangers related with it, like extortion and deception. Subsequently, customers really should practice watchfulness and examination the dealer and item prior to making a buy.Product exchanging and trading is a type of internet business that includes purchasers purchasing, selling, or trading items with different customers on the web. It is regularly finished on internet based commercial centers or sale destinations, and can include different items, from handed down products to hand tailored specialties and administrations. This kind of exchange for the most part happens on internet based commercial centers or closeout sites.C2CPT includes a great many items, from handed down merchandise to high quality specialties and administrations. C2CPT gives a supportive and sensible way for clients to sell and buy things, there are similarly potential risks related with it.

CHAPTER 2

LITERATURE SURVEY

2.1 INFERENCES FROM LITERATURE SURVEY

TITLE: Online Expert-Based Prediction for Cognitive Radio Secondary Markets.

AUTHOR: Juan Vanerio, Federico Larroca.

YEAR: 27 August 2019.

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DESCRIPTION:

The growing importance of wireless communications drives an increasing interest in dynamic access to spectrum resources. This requires efficient management policies that allow spectrum sharing between licensed primary users (PU) and unlicensed secondary users (SU). On such scenario, PUs shall preserve their usage priority right over any SU. Also, no SU shall interfere on any PU. Technical viability can be achieved through Cognitive Radio devices that adjust their operating parameters adaptively. After discussing several economic and technical models to achieve efficient spectrum sharing, we propose an on-demand secondary market model regulated by a spectrum broker who controls resource allocation. This model provides economic incentives for both kind of users to cooperate: SUs are charged by the broker on behalf of PUs for resource utilization but are indemnified if expelled to ensure PU priority. We describe the main characteristics of such a system and address the question of what allocation decisions should the broker take in order to achieve economic benefit regardless of users behavior. Several online expert-based no-regret algorithms are proposed to guide the decision taking process and evaluated under different user behavior patterns. Their results are compared with the ones achieved by dynamic programming to assess its convenience.

TITLE: Secondary spectrum oligopoly market over large locations.

AUTHOR: Arnob Ghosh, Saswati Sarkar.

YEAR: 30 March 2017.

DESCRIPTION:

We investigate a secondary spectrum market where each primary owns a channel over large number of locations. Each primary sells its channel to the secondaries in exchange of a price. However, the secondaries can not transmit simultaneously at interfering locations. A primary must select a price and a set on non-interfering locations for its available channel where the availability of a channel for sale evolves randomly. The set of non-interfering locations turns out to be an independent set in the conflict graph representation of the region. The primary needs to find a strategy for each possible channel state vector. We consider node symmetric conflict graphs which arise frequently in practice when the number of locations is large (potentially, infinite). Since there is a symmetry in the interference relationship, we also consider a symmetric relationship among the joint probability distribution of the channel state vectors. We show that that a symmetric NE exists and explicitly compute it. In the symmetric NE a primary randomizes equally among the maximum independent sets at a given channel state vector. The symmetric NE exhibits several important structural differences compared to the symmetric NE strategy for small number of locations which we have obtained in our earlier works. The conflict graph representation depends on the channel state vector, thus, it is a random graph. We also empirically and theoretically investigate the expected component size in random conflict graphs which governs the computation of maximum independent sets. Our analysis shows that the mean component size is in general moderate, however, it can be high when the channel availability probability is very high. We show that with random sampling method, a primary can govern the mean component size. We numerically evaluate the ratio of the expected payoff attained by primaries in the game and the payoff attained by primaries when all the primaries collude.

TITLE: Price Competition in Spectrum Markets:How Accurate Is the Continous Prices Approximation?

AUTHOR: Aditya Mvs,Abhishek Raghuvanshi,G.Kasbekar.

YEAR: 30 March 2020.

DESCRIPTION:

Dynamic Spectrum Access technology enables two types of users to operate on a channel- primary users, which have prioritized access to the channel and secondary users, which can use the channel when it is not in use by the primaries. We consider a scenario in which multiple primaries own bandwidth in a large region (e.g., a state), which is divided into smaller locations (e.g., towns). This results in price competition among the primaries. In prior work, this price competition has only been studied under the approximation, made for analytical tractability, that the price of each primary takes values from a continuous set. In this paper, we investigate the fundamental question of how the behaviour of the players involved in the price competition changes when this continuity assumption is removed. However, we show that as the number of available prices becomes large in the discrete prices game, the strategies of the primaries under every symmetric NE converge to the unique NE strategy of the game with continuous price sets. Two different user types can operate on a channel thanks to dynamic spectrum access technology: main users who have priority access to the channel and secondary users who can utilise the channel when the primaries are not using it. We take into account a scenario in which numerous primary control bandwidth in a sizable area (like a state) that is partitioned into smaller areas (like towns). A main would wish to rent out spare bandwidth to secondary systems at a number of places where there won't be any interference between them in exchange for a charge.As a result, the primaries compete on pricing. Prior research has only examined this price rivalry under the rough assumption—made for analytical readability—that the price of each primary takes values from a continuous collection. In prior work, this price competition has only been studied under the approximation, made for analytical tractability, that the price of each primary takes values from a continuous set.

2.2 OPEN PROBLEMS IN EXISTING SYSTEM

While consumer-to-consumer (C2C) product trading and exchanging has become more popular in recent years due to the rise of online marketplaces and peer-to-peer platforms, there are still some open problems in the existing system that need to be addressed to ensure the security, fairness, and efficiency of transactions.

- Trust: One of the biggest challenges in C2C product trading and exchanging is establishing trust between buyers and sellers who often do not know each other. Many buyers and sellers are hesitant to transact with strangers, and there is always a risk of fraud or deception.This can be addressed through measures such as user reviews, ratings, and verification systems, but these methods are not foolproof and can be manipulated.

- Payment Security: Another problem in C2C product trading and exchanging is payment security. While online payment platforms have made it easier to transfer funds between buyers and sellers, there is always a risk of fraudulent activity or unauthorized access to financial information.Payment security measures such as encryption and two-factor authentication can help to mitigate these risks, but they are not always foolproof.

- Dispute Resolution: Disputes can arise in C2C product trading and exchanging over issues such as product quality, delivery, or payment. Existing dispute resolution systems can be slow, costly, and may not always result in a fair outcome for both parties. There is a need for more efficient and fair dispute resolution mechanisms that can address these issues in a timely and effective manner.

- Product Authenticity: With the rise of counterfeiting and fake products, ensuring the authenticity of products being traded or exchanged in C2C platforms has become a major concern. Installment safety efforts, for example, encryption and two-factor confirmation can assist with alleviating these dangers, however they are not idiot proof 100% of the time.

- Shipping and delivery: Shipping and delivery can also be a problem in C2C trading. Buyers may be hesitant to purchase from sellers in other countries due to the high shipping costs and long delivery times. In addition, there is a risk of lost or damaged shipments, which can result in financial losses for both buyers and sellers.

- Quality control: In C2C trading and exchanging, there is often no guarantee of the quality or condition of the product being sold. This can lead to disputes and conflicts between buyers and sellers.

- Regulatory Compliance: C2C product trading and exchanging is often subject to a variety of regulations, such as consumer protection laws, tax laws, and data privacy laws. Ensuring compliance with these regulations can be challenging for both buyers and sellers, especially when trading across different countries or jurisdictions.

There is no security concerns in the Consumer-to-consumer product trading. It may cause some serious issues and it may lead to collapse the trading service or to leakage users data. Market Cleaning Mechanism - the market mechanism is a mechanism by which the use of money exchanged by buyers and sellers with an open and understood system of value and time in a market. It is a strategy to analyze the aggregated data. It has been criticized for weak environmental integrity, high transaction costs and complex governance.Trading of goods from consumer to consumer has no security risks. It might result in some major problems, the collapse of the trading service, or the disclosure of customer data. Market Cleaning Mechanism - The market mechanism is a way for buyers and sellers to exchange money in a market with a transparent and well-understood system of value and time. It is a method to examine the compiled data. Its poor environmental integrity, high transaction costs, and convoluted governance have all drawn criticism. Through the theoretical safety analysis and experimental evaluation, the feasibility of our scheme has been validated, which is really a powerful supplement to existing cloud storage scheme.It may cause some serious issues and it may lead to collapse the trading service or to leakage users data.

CHAPTER 3

REQUIREMENTS ANALYSIS

3.1 FEASIBILITY STUDY

Feasibility studies aim to objectively and rationally uncover the strengths and weaknesses of the existing business or proposed venture, opportunities and threats as presented by the environment, the resources required to carry through, and ultimately the prospects for success. In its simplest term, the two criteria to judge feasibility are cost required and value to be attained. As such, a well-designed feasibility study should provide a historical background of the business or project, description of the product or service, accounting statements, details of the operations and management, marketing research and policies, financial data, legal requirements and tax obligations. Based on the results of the feasibility study, the project team can decide whether to proceed with developing the C2C product trading and exchanging platform or to abandon the idea. If the study shows that the platform is feasible, the team can move on to the next steps of the development process, such as designing, developing, testing, and deploying the platform.

Technical Feasibility:

This study is carried out to check the technical feasibility, that is, the technical requirements of the system. Any system developed must not have a high demand on the available technical resources.

Economic Feasibility:

The assessment is based on an outline design of system requirements in terms of Input, Processes, Output, Fields, Programs, and Procedures. This can be quantified in terms of volumes of data, trends, frequency of updating, etc. in order to estimate whether the new system will perform adequately or not.

Operational Feasibility:

The aspect of study is to check the level of acceptance of the system by the user. This includes the process of training the user to use the system efficiently. The user must not feel threatened by the system, instead must accept it as a necessity.

3.2 SOFTWARE REQUIREMENTS SPECIFICATION DOCUMENT

Hardware Requirements:

The hardware requirements may serve as the basis for a contract for the implementation of the system and should therefore be a complete and consistent specification of the whole system. They are used by software engineers as the starting point for the system design. It shows what the system does and not how it should be implemented.

➢ Processor	-	Intel Pentium Dual Core 2.00GHz
➢ Speed	-	2.40 GHz
➢ RAM	-	4 GB
➢ Hard Disk	-	250 GB

Software Requirements:

The software requirements document is the specification of the system. It should include both a definition and a specification of requirements. It is a set of what the system should do rather than how it should do it. The software requirements provide a basis for creating the software requirements specification. It is useful in estimating cost, planning team activities, performing tasks and tracking the teams and tracking the team's progress throughout the development activity.

➢ Front End	:	J2ee (Jsp, Servlet)
➢ Back End	:	My Sql 5.5

3.3 SOFTWARE SPECIFICATION

The purpose of this Software Requirements Specification (SRS) document is to outline the functional and non-functional requirements for a Consumer-to-Consumer (C2C) product trading and exchanging software. This software will provide a platform for individuals to buy, sell, and exchange products with other consumers.

Functional Requirements:

- User Registration: The software should allow users to register and create an account. Users should be able to enter their personal information such as name, address, email, and phone number. The registration process should also include an email verification step to confirm the user's identity.

- Product Listings: The software should allow users to create product listings. Users should be able to enter the product name, description, price, and upload product images. Users should also be able to edit or delete their product listings.

- Product Search: The software should allow users to search for products based on keywords, categories, and location. Users should be able to view product listings, see product details, and contact the seller through the software.

- Payment Integration: The software should integrate payment methods such as PayPal or credit card payment gateways. The payment process should be secure and easy to use for both buyers and sellers.

- Messaging System: The software should provide a messaging system for buyers and sellers to communicate with each other. This system should allow users to send and receive messages, negotiate prices, and discuss details about the product.

- Rating and Review System: The software should provide a rating and review system for buyers and sellers. Users should be able to rate and leave reviews for products and sellers. This system should help build trust and credibility among users.

- User Dashboard: The software should provide a user dashboard that allows users to manage their listings, view messages, track transactions, and view their ratings and reviews.

Non-Functional Requirements:

- Security: The software should be designed with security in mind. All user data should be encrypted and stored securely. The payment process should also be secure and compliant with industry standards.

- Performance: The software should be able to handle a large number of users and transactions. It should be designed with scalability in mind to ensure that it can handle growth and increased usage over time.

- Usability: The software should be easy to use and navigate. The user interface should be intuitive and user-friendly. It should also be accessible on a variety of devices, including desktop and mobile devices.

- Reliability: The software should be reliable and available to users at all times. It should be designed with redundancy and backup systems in place to ensure that it can handle any potential system failures or downtime.

The platform used here is JAVA. The Primary languages are JAVA,J2EE and J2ME. In this project J2EE is chosen for implementation. **Java** is a programming language originally developed by James Gosling at Sun Microsystems and released in 1995 as a core component of Sun Microsystems' Java platform. The language derives much of its syntax from C and C++ but has a simpler object model and fewer low-level facilities.

Java applications are typically compiled to byte code that can run on any Java Virtual Machine (JVM) regardless of computer architecture. Java is general-purpose, concurrent, class-based, and object-oriented, and is specifically designed to have as few implementation dependencies as possible. It is intended to let application developers "write once, run anywhere".Java is considered by many as one of the most influential programming languages of the 20th century, and is widely used from application software to web applications The java framework is a new platform independent that simplifies application development internet. Java technology's versatility, efficiency, platform portability, and security make it the ideal technology for network computing. From laptops to datacenters, game consoles to scientific supercomputers, cell phones to the Internet, Java is everywhere.

Java has been tested, refined, extended, and proven by a dedicated community. And numbering more than 6.5 million developers, it's the largest and most active on the planet. With its versatility, efficiency, and portability, Java has become invaluable to developers by enabling them.JSP and Servlets are gaining rapid acceptance as means to provide dynamic content on the Internet. With full access to the Java platform, running from the server in a secure manner, the application possibilities are almost limitless.When JSPs are used with Enterprise JavaBeans technology, e-commerce and database resources can be further enhanced to meet an enterprise's needs for web applications providing secure transactions in an open platform.J2EE technology as a whole makes it easy to develop, deploy and use web server applications instead of mingling with other technologies such as CGI.There are many tools for facilitating web software development and to easily convert existing server-side technologies to JSP and Servlets.

The systems architect establishes the essential structure of the system. We propose a Hash code Solomon algorithm and that we can put a small a part of the data on the local machine and fog server so as to protect the privacy. Moreover, based on computational intelligence, this algorithm can compute the distribution proportion stored in the cloud, fog, and native machine, respectively through the theoretical safety.

Analysis and experimental evaluation, the feasibility of our scheme has been validated, which is absolutely a robust supplement to the existing cloud storage scheme.

Scalability: Java is a scalable language that can handle a high volume of user traffic and transactions. With the ability to handle multiple users and transactions simultaneously, the platform can grow and scale without any performance issues. The J2EE platform provides additional scalability features like load balancing, clustering, and caching, making it ideal for large-scale applications.

Flexibility: Java is a versatile language that can run on various platforms, including desktops, mobile devices, and web browsers. The platform can be built using a combination of different technologies and frameworks, making it flexible enough to adapt to changing user needs and preferences. J2EE provides additional flexibility features like modular design, component-based architecture, and support for different programming languages.

Security: Security is critical for any C2C product trading and exchanging platform. Java has several security features built-in, making it an excellent choice for developing secure platforms. Additionally, SQL provides powerful database security features that ensure data protection, privacy, and integrity. J2EE provides additional security features like authentication, authorization, and encryption, making it a secure platform.

Reliability: Java is a mature and reliable programming language that has been used for developing large-scale enterprise applications for many years. It has a robust ecosystem of libraries, frameworks, and tools that make development faster, more efficient, and less prone to errors. The combination of JSP, HTML/CSS, and JavaScript provides a reliable and stable user interface that users can depend on. J2EE provides additional reliability features like fault tolerance, transaction management, and error handling, making it a reliable platform.

Performance: Java is a high-performance language that can handle large-scale data processing and complex algorithms.

The combination of SQL, JSP, and JavaScript provides a high-performance platform that can handle complex user interactions, searches, and transactions. J2EE provides additional performance features like connection pooling, thread management, and caching, making it a high-performance platform.

Cross-platform compatibility: The combination of Java, SQL, JSP, HTML/CSS, JavaScript, and J2EE provides a platform that can run on multiple operating systems and devices, making it accessible to a wide range of users.

In summary, Java full stack with SQL, JSP, HTML/CSS, JavaScript, and J2EE is an excellent choice for developing a C2C product trading and exchanging platform due to its scalability, flexibility, security, reliability, performance, and cross-platform compatibility.

Conclusion: This software requirements specification document outlines the functional and non-functional requirements for a C2C product trading and exchanging software. The software should provide a secure, user-friendly platform for individuals to buy, sell, and exchange products with other consumers.

3.4 SYSTEM USE CASE

Below are some use cases for the Consumer-to-Consumer (C2C) product trading and exchanging system:

- User Registration: The user wants to create an account on the platform to be able to buy, sell, or exchange products with other consumers. The user navigates to the registration page, enters their personal information, and confirms their email address. Once registered, the user can log in to the system.
- Product Listing: The user wants to list a product they want to sell or exchange. The user navigates to the "List Product" page, enters the product name, description, price, and uploads product images. The system then posts the product listing to the platform for other users to see.

- Product Search: The user wants to search for a product they are interested in buying or exchanging. The user navigates to the "Search Product" page, enters keywords or selects a category, and views the results. The system shows the product listings that match the user's search criteria.
- Product Purchase: The user wants to buy a product from another user. The user navigates to the product listing page, selects the "Buy" option, and enters their payment information. The system processes the payment and notifies the seller of the purchase. The seller then ships the product to the buyer.
- Product Exchange: The user wants to exchange a product with another user. The user navigates to the product listing page, selects the "Exchange" option, and contacts the seller through the messaging system to discuss the details of the exchange. Once the exchange is agreed upon, the users can proceed with the exchange.
- Product Rating and Review: The user wants to leave a rating and review for a product or seller. The user navigates to the "Rating and Review" page, selects the product or seller, and leaves a rating and review. The system then displays the rating and review on the product or seller's page.
- User Dashboard: The user wants to manage their listings, view messages, track transactions, and view their ratings and reviews. The user navigates to their user dashboard, where they can perform all these actions in one place.

The use case diagram is the main building block of object oriented modeling. It is

- used both for general conceptual modeling of the systematic of the application, and for detailed modeling translating the models into programming code. For this in our component diagram first propose a data In this proposed method we are using Hash-Solomon Code Algorithm to encrypt the data. Based on computational intelligence, this algorithm can compute the distribution proportion stored in cloud, fog, and local machine, respectively. selects the "Exchange" option, and contacts the seller through the messaging system to discuss the details of the exchange. Once the exchange is agreed upon, the users can proceed with the exchange.

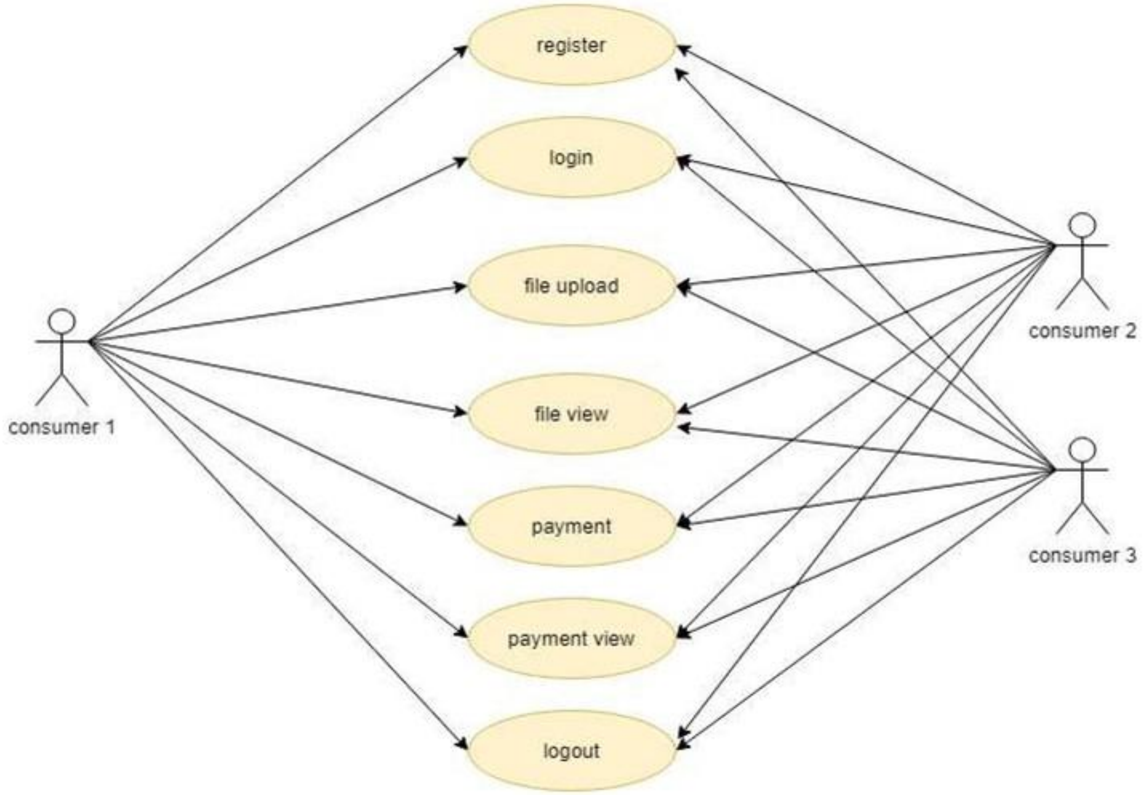

Fig 3.1 Use Case Diagram

Actors:

- Buyer: The user who wants to purchase a product from a seller.
- Seller: The user who wants to sell a product to a buyer.

Use Cases:

- Search Products: The buyer can search for products using various criteria.
- View Product: The buyer can view details of a specific product.
- Purchase Product: The buyer can initiate a purchase for a product.
- Add Product: The seller can add a new product to the platform.
- Edit Product: The seller can edit the details of a product.
- Delete Product: The seller can delete a product from the platform.
- Accept Purchase: The seller can accept a purchase from a buyer.
- Reject Purchase: The seller can reject a purchase from a buyer.

Relationships:

- The Buyer can Search Products, View Product, and Purchase Product.
- The Seller can Add Product, Edit Product, Delete Product, Accept Purchase, and Reject Purchase.
- The Use Case Accept Purchase is associated with the Use Case Purchase Product, indicating that it is a follow-up action to the initial Purchase Product use case.
- The Use Case Reject Purchase is associated with the Use Case Purchase Product, indicating that it is a follow-up action to the initial Purchase Product use case.

Overall, this use case diagram provides a high-level overview of the key features and functionalities of a C2C product trading and exchanging platform, and how the various actors interact with the platform. The diagram serves as a starting point for more detailed analysis and design of the platform. Use-case diagrams describe the high-level functions and scope of a system. These diagrams also identify the interactions between the system and its actors. The use cases and actors in use-case diagrams describe what the system does and how the actors use it, but not how the system operates internally.Use-case diagrams illustrate and define the context and requirements of either an entire system or the important parts of the system. You can model a complex system with a single use-case diagram, or create many use-case diagrams to model the components of the system. You would typically develop use-case diagrams in the early phases of a project and refer to them throughout the development process. The scope and high-level functions of a system are described in use-case diagrams. The interactions between the system and its actors are also depicted in these diagrams. utilise-case diagrams show what the system does and how the actors utilise it, but they do not show how the system works within.The context and needs of either the complete system or the key components of the system are illustrated and defined through use-case diagrams. A complicated system can be represented by a single use-case diagram, or its many components can be represented by a number of use-case diagrams.

CHAPTER 4

DESCRIPTION OF PROPOSED SYSTEM

The proposed Consumer-to-Consumer (C2C) product trading and exchanging system is an online platform designed to provide individuals with a secure and user-friendly way to buy, sell, and exchange products with other consumers.The system will allow users to register and create an account, where they can list products they want to sell or exchange, search for products they want to buy or exchange, and communicate with other users through a messaging system. The system will also integrate payment methods such as PayPal or credit card payment gateways to facilitate transactions between buyers and sellers.

The system will have a product search feature that allows users to search for products based on keywords, categories, and location. Users will be able to view product listings, see product details, and contact the seller through the messaging system. The system will also provide a rating and review system for buyers and sellers, where users can rate and leave reviews for products and sellers to help build trust and credibility among users.The proposed system will have a user dashboard where users can manage their listings, view messages, track transactions, and view their ratings and reviews. The user dashboard will be easy to use and navigate, and accessible on a variety of devices, including desktop and mobile devices.

The system will be designed with security, scalability, and reliability in mind. All user data will be encrypted and stored securely, and the payment process will be secure and compliant with industry standards. The system will be able to handle a large number of users and transactions, and will be designed with redundancy and backup systems in place to ensure that it can handle any potential system failures or downtime.In summary, the proposed C2C product trading and exchanging system will provide a secure, user-friendly platform for individuals to buy, sell, and exchange products with other consumers, with features such as product listings, product search, payment integration, messaging system, rating and review system, and user dashboard.

4.1 METHODOLOGY

There are various software development methodologies available for the development of the Consumer-to-Consumer (C2C) product trading and exchanging system. However, based on the nature of the project, Agile methodology would be the most appropriate methodology for this system.Agile methodology is well suited for projects that require flexibility and adaptability to changing requirements. It focuses on delivering working software in short iterations, allowing for frequent feedback and continuous improvement. In the case of the C2C product trading and exchanging system, the requirements may change frequently, and users may have varying needs and preferences. Agile methodology will enable the development team to respond quickly to changes in requirements and provide timely updates and enhancements to the system. Realization of these objectives requires systematic planning and careful implementation. To this effect, application of knowledge, skill, tools and techniques in the project environment, refers to project management. Project management in recent years has proliferated, reaching new heights of sophistication. It has emerged as a distinct area of management practices to meet the challenges of new economic environment, globalization process, rapid technological advancement, and quality concerns of the stakeholders.

Additionally, the Agile methodology promotes collaboration and communication between the development team and stakeholders, which is crucial in the development of the C2C product trading and exchanging system. Frequent communication between the development team and stakeholders will help to ensure that the system is developed to meet the needs of the users.

Another advantage of Agile methodology is that it encourages a modular and incremental approach to development. This approach allows the development team to break down the system into smaller, manageable pieces, and deliver them in short iterations. This approach will enable the development team to focus on delivering specific features and functionality of the system, making it easier to test, debug and improve.

In summary, the Agile methodology is well-suited for the development of the C2C product trading and exchanging system. Its flexible and adaptable nature, focus on collaboration and communication, and modular approach to development make it an ideal choice for this project.

Project Performance Dimensions:

Three major dimensions that define the project performance are scope, time, and resource. These parameters are interrelated and interactive. The relationship generally represented as an equilateral triangle.It is evident that any change in any one of dimensions would affect the other. For example, if the scope is enlarged, project would require more time for completion and the cost would also go up. If time is reduced the scope and cost would also be required to be reduced. Similarly any change in cost would be reflected in scope and time. Successful completion of the project would require accomplishment of specified goals within scheduled time and budget. In recent years a forth dimension, stakeholder satisfaction, is added to the project. However, the other school of management argues that this dimension is an inherent part of the scope of the project that defines the specifications to which the project is required to be implemented. Thus the performance of a project is measured by the degree to which these three parameters (scope, time and cost) are achieved.

The Consumer-to-Consumer (C2C) product trading and exchanging system can be developed using an iterative and incremental process model. This process model is a combination of the Agile methodology and the Spiral model is a risk-driven process model that consists of several iterative cycles. Each cycle involves a series of activities, such as requirements gathering, design, development, testing, and deployment. The model is called the spiral model because each cycle represents a spiral that loops back to the beginning of the next cycle.

The iterative and incremental process model for the C2C product trading and exchanging system would involve the following steps:

- Planning: In this phase, the development team will define the project scope, requirements, and objectives. The team will also identify the risks associated with the project and plan how to mitigate them.

- Design: In this phase, the development team will design the system architecture, user interface, and data model. The team will also create wireframes and prototypes to test the usability of the system.

- Development: In this phase, the development team will implement the system based on the design specifications. The team will also develop unit tests and integration tests to ensure that the system functions correctly.

- Testing: In this phase, the development team will test the system to identify and fix any defects. The team will also perform acceptance testing to ensure that the system meets the requirements.

- Deployment: In this phase, the development team will deploy the system to the production environment. The team will also provide user training and support to ensure that users can use the system effectively.

- Feedback: In this phase, the development team will collect feedback from users and stakeholders to identify areas for improvement. The team will then use this feedback to refine the system and plan for the next iteration.

This iterative and incremental process model will allow the development team to deliver working software in short iterations while incorporating user feedback and mitigating project risks. The combination of the Agile methodology and the Spiral model will enable the development team to develop a high-quality, user-friendly C2C product trading and exchanging system that meets the needs of users.

4.2 ARCHITECTURE/OVERALL DESIGN OF PROPOSED SYSTEM

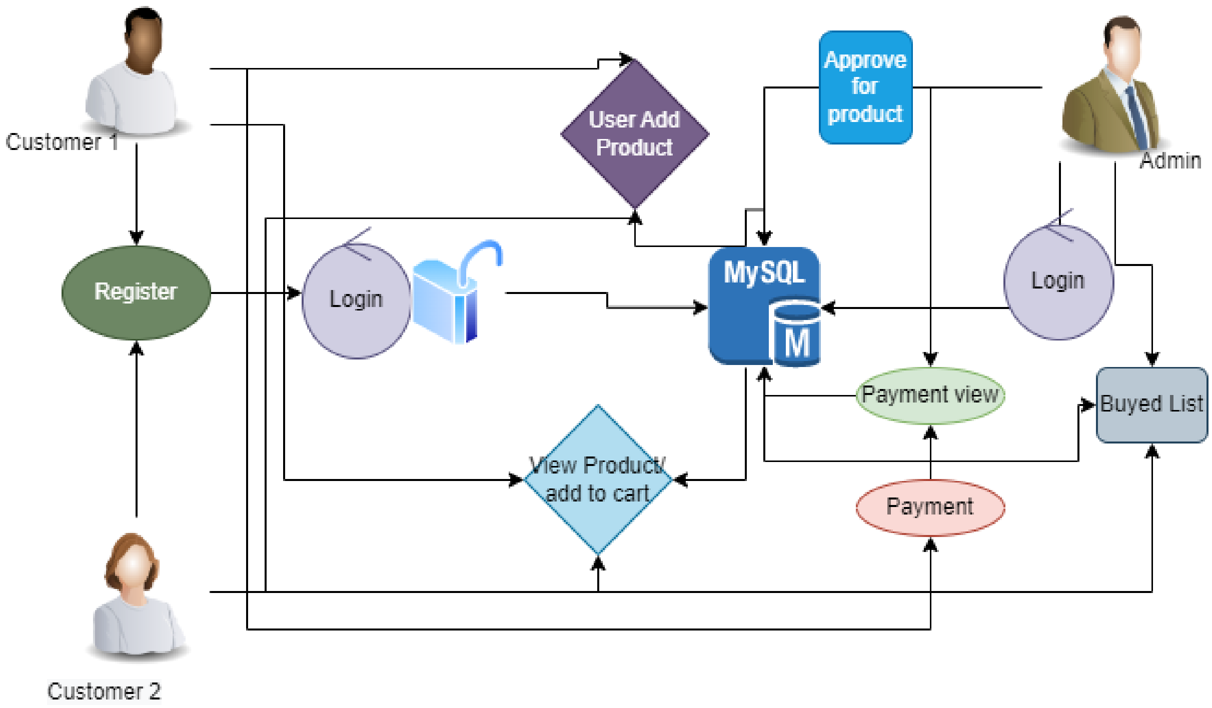

Fig 4.1 Architecture Diagram

The architecture of a Consumer-to-Consumer (C2C) product trading and exchanging system should be designed to provide a reliable, scalable, and secure platform that can support multiple concurrent users and a large volume of transactions. The following are the key components of the system architecture:

- User Interface: The user interface is the front-end component of the system that enables users to interact with the platform. The user interface should be designed to provide an intuitive and user-friendly experience for users. It should allow users to search for products, view product details, communicate with sellers or buyers, and complete transactions.

- Application Server: The application server is the middleware that connects the user interface with the back-end database and other services. It should provide an interface for processing user requests and responses, handling business logic, and managing transactions.

- Database: The database is the back-end component of the system that stores all the data related to the C2C product trading and exchanging activities, including user profiles, product details, transaction history, and feedback. The database should be designed to handle a large volume of data and provide efficient and secure access to the data.

- Payment Gateway: The payment gateway is a critical component of the system that facilitates secure and reliable online payments between buyers and sellers. It should support multiple payment options and provide secure encryption and transaction processing.

- Security Infrastructure: The security infrastructure is an essential component of the system that ensures the confidentiality, integrity, and availability of the data and transactions. It should include measures such as user authentication, data encryption, access control, and monitoring and logging.

- Integration with Third-Party Services: The C2C product trading and exchanging system may need to integrate with third-party services such as shipping providers, social media platforms, and advertising networks to provide additional functionalities and features to users.

4.3 SOFTWARE FOR IMPLEMENTATION AND TESTING PLAN OF THE ` PROPOSED SYSTEM

The implementation and testing plan should include the following steps:

- Requirements gathering: The development team should gather and document the requirements for the software.
- Design and development: The development team should design and develop the software based on the requirements.
- Unit testing: The development team should conduct unit testing to ensure that each component of the software functions correctly.

- Integration testing: The development team should conduct integration testing to ensure that all the components of the software work together as intended.
- System testing: The development team should conduct system testing to ensure that the software meets the requirements and performs as expected.
- User acceptance testing: The development team should conduct user acceptance testing to ensure that the software meets the needs of users and is user-friendly.
- Deployment: The development team should deploy the software to the production environment.
- Maintenance: The development team should provide ongoing maintenance and support for the software.

Overall, the architecture of the C2C product trading and exchanging system should be designed to provide a reliable, scalable, and secure platform that meets the needs of users and supports the growth and expansion of the business. The architecture should be modular, flexible, and adaptable to accommodate future changes and enhancements to the system. The C2C product dealing and exchanging system's architecture should be created to offer a dependable, scalable, and secure platform that satisfies user demands and supports the development and growth of the company. The design must be modular, adaptive, and flexible in order to support system upgrades and future modifications.

4.4 PROJECT MANAGEMENT PLAN

The project aims to create an online platform for consumers to trade and exchange products with each other. The platform will enable consumers to list products they no longer need and connect with other users who are interested in acquiring those products. The platform will provide features such as secure payment processing, user rating and review systems, to facilitate transactions and communication between users.

Conceptualization Phase:

Conception phase, starting with the seed of an idea, it covers identification of the product / service, Pre-feasibility, Feasibility studies and Appraisal and Approval. The project idea is conceptualized with initial considerations of all possible alternatives for achieving the project objectives. As the idea becomes established a proposal is developed setting out rationale, method, estimated costs, benefits and other details for appraisal of the stakeholders. After reaching a broad consensus on the proposal the feasibility dimensions are analyzed in detail.

Planning Phase:

In this phase the project structure is planned based on project appraisal and approvals. Detailed plans for activity, finance, and resources are developed and integrated to the quality parameters. In the process major tasks need to be performed in this phase are

- Identification of activities and their sequencing
- Time frame for execution
- Estimation and budgeting
- Staffing
- A Detailed Project Report (DPR) specifying various aspects of the project is finalized to facilitate execution in this phase.

Project Objectives:

- To develop an online platform that allows purchasers to exchange items with buyers.
- To provide a user-friendly interface for users to list, browse and search for items.
- To ensure secure payment processing and transactions.
- To implement a user rating and review system to maintain quality control and enhance user trust.
- To provide messaging capabilities to facilitate communication between users.

- To ensure the platform is scalable and can handle increasing traffic as it grows.
- To launch the platform within six months and achieve a user base of 10,000 within the first year.

Project Deliverables:

- Online platform with user registration and login functionality.
- Item listing, browsing and searching functionality.
- Secure payment processing system integrated with major payment gateways.
- User rating and review system.
- Messaging system for users to communicate with each other.
- Analytics dashboard for monitoring platform usage and user activity.
- Scalable infrastructure capable of handling increasing traffic.

Project Scope:

- Development of an online platform with features as described above.
- Integration of third-party payment gateways for secure payment processing.
- Development of an algorithm for matching users based on item preferences and availability.
- Development of a user rating and review system to maintain quality control and enhance user trust.
- Development of a messaging system for users to communicate with each other.
- Development of an analytics dashboard for monitoring platform usage and user activity.
- Testing and bug-fixing of the platform to ensure functionality and user experience.
- Launch of the platform and initial marketing activities to attract users.

Project Management Approach:

The project will be managed using the Agile methodology. The development team will work in sprints of two weeks each, with regular meetings and progress updates. The product owner will be responsible for prioritizing features and managing the backlog. The project manager will be responsible for overall project coordination, monitoring progress, and ensuring timely delivery of project milestones. Risk management will be an ongoing process, with risks identified and mitigated throughout the project lifecycle. Communication will be regular and transparent, with stakeholders updated on progress and any changes in scope or timeline.

4.5 FINANCIAL REPORT ON ESTIMATED COSTING

Based on the project management plan for Consumer to Consumer Product Trading & Exchanging, the estimated costing can be broken down as follows:

- Personnel: $250,000
  This includes the salaries of the project manager, developers, designers, and other staff involved in the project. The personnel cost is based on an estimated 10 full-time employees working on the project for 6 months.

- Platform development: $200,000
  This includes the cost of designing and developing the online platform, including front-end and back-end development, database design, and testing.

- Payment processing integration: $25,000
  This includes the cost of integrating a secure payment processing system, such as Stripe or PayPal, into the platform.

- User rating and review system development: $15,000

This includes the cost of developing a user rating and review system to maintain quality control and enhance user trust.

- Messaging system development: $10,000
  This includes the cost of developing a messaging system for users to communicate with each other

- Analytics dashboard development: $10,000
  This includes the cost of developing an analytics dashboard for monitoring platform usage and user activity.

- Testing and bug-fixing: $40,000
  This includes the cost of testing the platform and fixing any bugs or issues that arise during development.

- Platform launch and marketing activities: $30,000
  This includes the cost of launching the platform and initial marketing activities to attract users.

- Total estimated cost: $575,000
  It is important to note that the above figures are estimates and may vary based on factors such as the complexity of the platform, the size of the development team, and the specific payment processing and messaging systems chosen for integration. It is also important to consider ongoing maintenance and operational costs for the platform beyond the initial development phase.

4.6 TRANSITION/SOFTWARE TO OPERATIONS PLANS

Once the Consumer to Consumer Product Trading & Exchanging platform has been developed and tested, it will be necessary to transition it to the operations phase. This will involve a number of steps, including deploying the platform to production servers, monitoring and optimizing its performance, and providing ongoing maintenance and support to ensure its smooth operation.

The following is a transition/software to operations plan for the Consumer to Consumer Product Trading & Exchanging platform:

Deployment to Production Servers

- Deploy the platform to production servers in a secure, reliable and scalable environment.
- Implement monitoring tools to ensure that the system is up and running, and that performance is optimal.
- Configure the platform to be available 24/7, with high availability and redundancy.

Performance Optimization

- Conduct load testing to ensure that the platform can handle high levels of traffic and usage.
- Optimize the platform's database, web servers, and caching systems to improve performance.
- Implement a Content Delivery Network (CDN) to improve the platform's speed and scalability.

Maintenance and Support

- Establish a maintenance and support team to provide ongoing maintenance and support for the platform.
- Develop processes and procedures for managing and resolving support requests, issues, and bugs.
- Provide regular updates and enhancements to the platform to improve its functionality and user experience.

Security and Compliance

- Conduct regular security audits and penetration testing to ensure that the platform is secure and compliant with industry standards.

- Implement security protocols, such as encryption and authentication, to protect user data and prevent unauthorized access.
- Develop and implement processes to ensure compliance with relevant regulations and standards.

User Support and Training

- Develop a user support portal to provide users with access to resources such as FAQs, tutorials, and user guides.
- Offer training to users to help them get the most out of the platform and its features.
- Provide timely and effective customer support to resolve any issues or problems that users encounter.

Continuous Improvement

- Monitor user feedback and usage data to identify areas for improvement and implement changes as necessary.
- Continuously evaluate and improve the platform's functionality, performance, and user experience.
- Implement a feedback loop to gather user feedback and use it to inform future development and improvement efforts.

Overall, this transition/software to operations plan aims to ensure that the Consumer to Consumer Product Trading & Exchanging platform is deployed and managed in a secure, reliable, and scalable manner, and that users receive the support they need to use the platform effectively.By implementing these steps, the platform can be successfully transitioned to the operations phase, and continue to provide value to users for years to come. This will involve a number of steps, including deploying the platform to production servers, monitoring and optimizing its performance, and providing ongoing maintenance and support to ensure its smooth operation. The size of the development team, and the specific payment processing and messaging systems chosen for integration. It is also important to consider ongoing maintenance and operational costs for the platform beyond the initial development phase.

The project manager will be responsible for overall project coordination, monitoring progress, and ensuring timely delivery of project milestones. Risk management will be an ongoing process, with risks identified and mitigated throughout the project. It will be necessary to transition it to the operations phase. This will involve a number of steps, including deploying the platform to production servers, monitoring and optimizing its performance, and providing ongoing maintenance and support to ensure its smooth operation.

Platform design: The platform design should be user-friendly, secure, and easy to navigate. Users should be able to list their products, view products that are available for trade or exchange, and communicate with potential trading partners.

Payment system: You'll need to set up a payment system that allows users to pay for products or trade them with other users. You could use a third-party payment system like PayPal or Stripe or build your payment system.

Trust and safety: Trust and safety are essential in any C2C platform. You'll need to implement measures to verify the identity of users, protect user data, and prevent fraudulent activities. This will involve a number of steps, including deploying the platform to production servers, monitoring and optimizing.

Marketing: You'll need to attract a large user base to your platform to ensure that there are enough products available for trading and exchanging. Marketing tactics like social media advertising, content marketing, and influencer outreach can help you reach your target audience.

Legal considerations: You'll need to comply with various laws and regulations, such as consumer protection laws and data privacy laws. Make sure you consult with a lawyer to ensure that your platform is legally compliant.

By carrying out these processes, the platform may effectively go from the development phase to the operations phase and continue to benefit users for many years to come.

The platform will need to be installed on production servers, its performance will need to be monitored and optimised, and continuous maintenance and support will be necessary to guarantee it runs smoothly.The size of the development team and the particular messaging and payment systems integrated. It's crucial to take into account the platform's continuous maintenance and operating expenditures after the original development stage.The project manager will be in charge of overall project coordination, tracking development, and making sure project milestones are delivered on schedule.

Risk identification and mitigation will take place continuously throughout the project as part of risk management. It must be moved from the planning phase to the operations phase. The platform will need to be installed on production servers, its performance will need to be monitored and optimised, and continuous maintenance and support will be necessary to guarantee it runs smoothly.

It must be moved from the planning phase to the operations phase. The platform will need to be installed on production servers, its performance will need to be monitored and optimised, and continuous maintenance and support will be necessary to guarantee it runs smoothly. Based on computational intelligence, this algorithm can compute the distribution proportion stored in cloud, fog, and local machine, respectively. The size of the development team and the particular messaging and payment systems integrated. It's crucial to take into account the platform's continuous maintenance and operating expenditures after the original development stage. . Risk management will be an ongoing process, with risks identified and mitigated throughout the project. It will be necessary to transition it to the operations phase. This will involve a number of steps, including deploying the platform to production servers, monitoring and optimizing its performance, Risk distinguishing proof and relief will occur consistently all through the task as a feature of hazard the executives. It should be moved from the arranging stage to the activities stage. The stage should be introduced on creation servers, its exhibition should be observed and advanced, and persistent upkeep and support will be important to promise it moves along as expected.

CHAPTER 5

IMPLEMENTATION DETAILS

The implementation of a Consumer to Consumer Product Trading & Exchanging platform involves several critical steps to ensure the success of the project. The following is an outline of the implementation details for the platform:

Develop the Platform Design:

- Conduct user research to determine the needs and preferences of the target audience.
- Create a user interface (UI) and user experience (UX) design that is intuitive, user-friendly, and visually appealing.
- Develop a clear and concise platform architecture that will be scalable and adaptable for future needs.

Develop the Platform Features:

- Develop a feature list based on user requirements and feedback.
- Prioritize and implement features that will have the most significant impact on the user experience and platform functionality.
- Develop features such as product listings, search functionality, payment processing, and messaging systems.

Platform Development:

- Develop the platform using an agile development methodology that allows for iterative improvements and feedback from stakeholders.
- Develop front-end and back-end systems, such as databases, servers, and APIs.
- Develop security protocols, such as encryption and authentication, to protect user data.

- Develop a clear and concise platform architecture that will be scalable and adaptable for future needs..

Testing and Quality Assurance:

- Conduct comprehensive testing of the platform to ensure that all features are functioning correctly and that there are no bugs or issues.
- Conduct user testing and feedback sessions to identify any areas for improvement and make necessary changes.
- Implement quality assurance processes to ensure that the platform meets industry standards and best practices.

Platform Launch and Marketing:

- Launch the platform to the target audience.
- Develop a marketing strategy to attract users and generate interest in the platform.
- Use social media and other digital marketing channels to promote the platform and reach a wider audience.

Ongoing Maintenance and Support

- Provide ongoing maintenance and support to ensure that the platform remains functional and responsive.
- Monitor platform performance and usage to identify any issues or areas for improvement.
- Provide customer support to users to help them use the platform effectively and resolve any issues that arise.

5.1 DEVELOPMENT AND DEPLOYMENT SETUP

Development Environment Setup:

- Install and configure the Java Development Kit (JDK) and Integrated Development Environment (IDE) such as Eclipse, NetBeans, or IntelliJ IDEA.
- Install and configure the database management system (DBMS) such as MySQL, PostgreSQL, or Oracle.

- Create a development environment that includes tools for version control, continuous integration, and automated testing.

Front-end Development:

- Develop the front-end of the platform using HTML, CSS, and JavaScript.
- Use JSP (Java Server Pages) technology to create dynamic web pages that can interact with the server.
- Use modern front-end frameworks such as Bootstrap or Materialize to create an interactive and responsive user interface.
- Ensure that the front-end is optimized for performance and accessibility.

Back-end Development:

- Develop the back-end of the platform using Java and Spring Framework.
- Use Spring Boot to create a robust and scalable back-end architecture.
- Use the Java Persistence API (JPA) for database communication and mapping of Java objects to database tables.

SQL Database Design and Implementation:

- Design and implement the SQL database for the platform.
- Define the database schema and relationships between tables.
- Implement stored procedures, triggers, and other database-specific features as needed.

One of the main reasons why the Java Server Pages technology has evolved into what it is today and it is still evolving is the overwhelming technical need to simplify application design by separating dynamic content from static template display data. Another benefit of utilizing JSP is that it allows to more cleanly separate the roles of web application/HTML designer from a software developer. The JSP technology is blessed with a number of exciting benefits, which are chronicled as follows:

The JSP technology is platform independent, in its dynamic web pages, its web servers, and its underlying server components. That is, JSP pages perform perfectly without any hassle on any platform, run on any web server, and web-enabled application server. The JSP technology emphasizes the use of reusable components. These components can be combined or manipulated towards developing more purposeful components and page design. This definitely reduces development time apart from the At development time, JSPs are very different from Servlets, however, they are precompiled into Servlets at run time and executed by a JSP engine which is installed on a Web-enabled application server such as BEA WebLogic and IBM WebSphere.

Earlier in client- server computing, each application had its own client program and it worked as a user interface and need to be installed on each user's personal computer. Most web applications use HTML/XHTML that are mostly supported by all the browsers and web pages are displayed to the client as static documents.

A web page can merely displays static content and it also lets the user navigate through the content, but a web application provides a more interactive experience.Any computer running Servlets or JSP needs to have a container. A container is nothing but a piece of software responsible for loading, executing and unloading the Servlets and JSP. While servlets can be used to extend the functionality of any Java- enabled server.

They are mostly used to extend web servers, and are efficient replacement for CGI scripts.CGI was one of the earliest and most prominent server side dynamic content solutions, so before going forward it is very important to know the difference between CGI and the Servlets.

Java Servlet is a generic server extension that means a java class can be loaded dynamically to expand the functionality of a server. Servlets are used with web servers and run inside a Java Virtual Machine (JVM) on the server so these are safe and portable. Unlike applets they do not require support for java in the web browser. Unlike CGI, servlets don't use multiple processes to handle separate request. Servets can be handled by separate threads within the same process. Servlets are also portable and platform independent.It worked as a user interface and need to be installed on each uiser’s personal computer.Most web applications use HTML/XHTML that are mostly supported by all the browsers and web pages are displayed to the client as a static document.

A web server is the combination of computer and the program installed on it. Web server interacts with the client through a web browser. It delivers the web page to the client and to an application by using the web browser and he HTTP protocols respectively.

The define the web server as the package of large number of programs installed on a computer connected to Internet or intranet for downloading the requested files using FileTransfer Protocol, serving e-mail and building and publishing web pages. A web server works on a client server model.

JSP and Servlets are gaining rapid acceptance as means to provide dynamic content on the Internet. With full access to the Java platform, running from the server in a secure manner, the application possibilities are almost limitless. When JSPs are used with Enterprise JavaBeans technology, e-commerce and database resources can be further enhanced to meet an enterprise's needs for web applications providing secure transactions in an open platform. J2EE technology as a whole makes it easy to develop, deploy and use web server applications instead of mingling with other technologies such as CGI and ASP. There are many tools for facilitating quick web software development and to easily convert existing server-side technologies to JSP and Servlets.

The systems architect establishes the essential structure of the system. We propose a Hash code Solomon algorithm and that we can put a small a part of the data on the local machine and fog server so as to protect the privacy. Moreover, based on computational intelligence, this algorithm can compute the distribution proportion stored in the cloud, fog, and native machine, respectively. Through the theoretical safety analysis and experimental evaluation, the feasibility of our scheme has been validated, which is absolutely a robust supplement to the existing cloud storage scheme.Web server applications have evolved from static to dynamic applications.This Evolution became necessary due to some deficiencies in earlier web site design to put more of business process on the web.

Servlets are powerful and sometimes they are a bit cumbersome when it comes to generating complex HTML. Most servlets contain a little code that handles application logic and a lot more code that handles output formatting. This can make it difficult to separate and reuse portions of the code when a different output format is needed. For these reasons, web application developers turn towards JSP as their preferred servlet environment. JSP pages are platform Java Server Pages Java Server Pages (JSP) technology is the Java platform technology for delivering dynamic content to web clients in a portable, secure and well-defined way. The Java Server Pages specification extends the Java Servlet API to provide web application developers with a robust framework for creating dynamic web content on the server using HTML, and XML templates, and Java code, which is secure, fast, and independent of server platforms.

Over the last few years, web server applications have evolved from static to dynamic applications. This evolution became necessary due to some deficiencies in earlier web site design. For example, to put more of business processes on the web, whether in business-to- consumer (B2C) or business-to-business (B2B) markets, conventional web site design technologies are not enough. The main issues, every developer faces when developing web applications, are:

Scalability - a successful site will have more users and as the number of users is increasing fastly, the web applications have to scale correspondingly.

Integration of data and business logic - the web is just another way to conduct business, and so it should be able to use the same middle-tier and data-access code.
Manageability - web sites just keep getting bigger and we need some viable mechanism to manage the ever-increasing content and its interaction with business systems.

Personalization - adding a personal touch to the web page becomes an essential factor to keep our customer coming back again. Knowing their preferences, allowing them to configure the information they view, remembering their past transactions or frequent search keywords are all important in providing feedback and interaction.

Apart from these general needs for a business-oriented web site, the necessity for new technologies to create robust, dynamic and compact server-side web applications has been realized. The main characteristics of today's dynamic web server applications are as follows:

1. Serve HTML and XML, and stream data to the web client
2. Separate presentation, logic and data
3. Interface to databases, other Java applications, CORBA, directory and mail services
4. Make use of application server middleware to provide transactional support.
5. Track client sessions.

J2EE stands for Java 2 Enterprise Edition, which is a set of Java APIs and technologies used for developing enterprise applications. J2EE provides a platform-independent, scalable, and secure environment for developing and deploying enterprise applications, including C2C product trading and exchanging platforms.

J2EE provides a wide range of APIs, including Servlets, JavaServer Pages (JSP), Java Message Service (JMS), Java Naming and Directory Interface (JNDI), and Enterprise JavaBeans (EJBs), among others. These APIs help in building robust, scalable, and high-performance enterprise applications.

In C2C product trading J2EE is used to develop the server-side components of the platform J2EE provides a comprehensive set of APIs for developing web-based applications, including JSPs for dynamic web content generation, Servlets for handling HTTP requests and responses, and JavaBeans for encapsulating business logic.
Additionally, J2EE provides a range of security features, including authentication, authorization, and encryption, which are critical for C2C product trading and exchanging platforms to protect sensitive information such as payment details and personal information.

In summary, J2EE is a set of Java APIs and technologies used for developing enterprise applications, including C2C product trading and exchanging platforms. It provides a platform-independent, scalable, and secure environment for developing and deploying server-side components of the platform.Developing Web Applications: J2EE provides APIs for developing web applications, including Servlets, JavaServer Pages (JSP), and JavaServer Faces (JSF). These APIs can be used to create dynamic web pages, handle user input, and communicate with the backend server.

Building Distributed Systems: J2EE provides APIs for building distributed systems, including Enterprise JavaBeans (EJB) and Java Message Service (JMS). These APIs can be used to build scalable and reliable systems that can handle large amounts of data and high levels of concurrency.Implementing Security: J2EE provides a range of security features, including authentication, authorization, and encryption. These features can be used to protect sensitive information, such as user credentials and payment details.

Integrating with Databases: J2EE provides APIs for accessing databases, including Java Database Connectivity (JDBC) and Java Persistence API (JPA). These APIs can be used to interact with the database and perform database operations such as inserting, updating, and retrieving data.

Scaling the Application: J2EE provides a range of features for scaling the application, including load balancing and clustering. These features can be used to ensure high availability and performance of the application, even during high traffic periods. Servlets, JavaServer Pages (JSP), Java Message Service (JMS), Java Naming and Directory Interface (JNDI), and Enterprise JavaBeans (EJBs), among others. These APIs help in building robust, scalable, and high-performance enterprise applications. J2EE technology as a whole makes it easy to develop, deploy and use web server applications instead of mingling with other technologies such as CGI and ASP. There are many tools for facilitating quick web software development and to easily convert existing server-side technologies to JSP and Servlets.

5.2 ALGORITHM

SHA Algorithm:

There is no security concerns in the Consumer-to-consumer product trading. It may cause some serious issues and it may lead to collapse the trading service or to leakage users data. Market Cleaning Mechanism - the market mechanism is a mechanism by which the use of money exchanged by buyers and sellers with an open and understood system of value and In the field of cryptography and crypt analytics, the SHA-1 algorithm could be a crypt-formatted hash function that is used to take a smaller input and produces a string that is 160 bits, also referred to as 20-byte hash value long. The hash value therefore generated, is understood as a message digest which is often rendered and produced as a hexadecimal number which is specifically 40 digits long. SHA is a family of cryptographic hash functions that are designed to take a message of any length and produce a fixed-length hash value. The hash value can be used to verify the integrity of the message and ensure that the message has not been tampered with. SHA is used to provide data integrity, ensuring that data is not modified during transmission.

Characteristics:

- The cryptographic hash functions are utilized and used to keep and store the secured form of data by providing three different kinds of characteristics such as pre-image resistance, which is also known as the first level of image resistance, the second level of pre-image resistance and collision resistance.
- The cornerstone lies in the fact that the pre-image crypt resistance technique makes it hard and more time consuming for the hacker or the attacker to find the original intended message by providing the respective hash value.
- The security, therefore, is provided by the nature of a one way that has a function that is mostly the key component of the SHA algorithm. The pre-image resistance is important to clear off brute force attacks from a set of huge and powerful machines.

- The foundation lies in the way that the pre-picture sepulcher opposition strategy makes.

Similarly, the second resistance technique is applied where the attacker has to go through a hard time decoding the next error message even when the first level of the message has been decrypted. The last and most difficult to crack is the collision resistance, making it extremely hard for the attacker to find two completely different messages which hash to the same hash value.

- Therefore, the ratio to the number of inputs and the outputs should be similar in fashion to comply with the pigeonhole principle. The collision resistance implies that finding two different sets of inputs that hash to the same hash is extremely difficult and therefore marks its safety.

Advantages:

- SHA is the acronym for Secure Hash Algorithm, used for hashing data and certificate files.
- Every piece of data produces a unique hash that is thoroughly non-duplicable by any other piece of data.
- The resulting digital signature is unique too as it depends on the hash that's generated out of the data.

These SHA algorithms are widely used in security protocols and applications, including the ones such as TLS, PGP, SSL, IPsec, and S/MiME. These also find their place in all the majority of cryptanalytic techniques and coding standards which is mainly aimed to see the functioning and working of majorly all governmental as well as private organizations and institutions. Major giants today such as Google, Microsoft, or Mozilla have started to recommend the use of SHA-3 and stop the usage of the SHA-algorithm.

AES Algorithm:

Advanced Encryption Standard (AES) is a specification for the encryption of electronic data established by the U.S National Institute of Standards and Technology (NIST) in

2001. AES is widely used today as it is a much stronger than DES and triple DES despite being harder to implement.

Features:

- SP Network: It works on an SP network structure rather than a Feistel cipher structure, as seen in the case of the DES algorithm.
- Key Expansion: It takes a single key up during the first stage, which is later expanded to multiple keys used in individual rounds.
- Byte Data: The AES encryption algorithm does operations on byte data instead of bit data. So it treats the 128-bit block size as 16 bytes during the encryption procedure.
- Key Length: The number of rounds to be carried out depends on the length of the key being used to encrypt data. The 128-bit key size has ten rounds, the 192-bit key size has 12 rounds, and the 256-bit key size has 14 rounds.

Advantages:

- As it is implemented in both hardware and software, it is most robust security protocol.
- It uses higher length key sizes such as 128, 192 and 256 bits for encryption. Hence it makes AES algorithm more robust against hacking.
- It is most common security protocol used for wide variety of applications such as wireless communication, financial transactions, e-business, encrypted data storage etc.
- It is one of the most widely used commercial and open source solutions across the world.
- No one can hack your personal information.
- For 128 bit, about 2128 attempts are needed to break.

AES is commonly used to encrypt sensitive information such as passwords, financial data, and other personal information. It is also used in secure communication protocols such as SSL and TLS to protect data in transit. Other common uses of AES include securing data in cloud storage and protecting confidential data in databases.Overall, AES is a highly secure and efficient encryption algorithm that provides a strong level of protection for sensitive information. Its widespread use and testing have demonstrated. Its effectiveness and reliability in a variety of applications, making it a popular choice for secure data protection.It can be used to encrypt communication channels between buyers and sellers, ensuring that messages and information exchanged during the transaction are protected from interception or eavesdropping. This can be especially important when sensitive information such as payment details or personal data is being exchanged.It can also be used to encrypt stored data such as buyer and seller profiles, transaction records, and other sensitive information. This can help prevent unauthorized access or theft of this data, protecting the privacy and security of both buyers and sellers.

Secure Transactions: AES can be used to encrypt payment details, such as credit card numbers, bank account information, and other sensitive financial data. This can help prevent fraud and unauthorized access to financial information, ensuring that transactions are secure and trustworthy.

Secure Identity Verification: AES can be used to encrypt biometric data such as facial recognition or fingerprint information, ensuring that this information is secure and protected from unauthorized access or tampering. This can help prevent identity theft and other forms of fraud, ensuring that transactions are legitimate and secure.

Strong Encryption: AES is a symmetric-key encryption algorithm, which means the same key is used for both encryption and decryption. It provides strong encryption and is considered one of the most secure encryption algorithms available today.

Compliance with Security Standards: AES is compliant with several security standards, including FIPS 197, which is a U.S. government standard for encryption. Compliance with these standards ensures that the platform is using a well-tested and recognized encryption algorithm.Protection of Sensitive Information: In C2C product trading and exchanging, sensitive information such as personal details, payment information, and transaction data are exchanged. AES encryption provides an additional layer of

protection to this sensitive information, making it more difficult for unauthorized access and data breaches.
Compatibility with Multiple Platforms: AES encryption is compatible with multiple platforms, including Java, J2EE, HTML, CSS, JSP, and JavaScript, which makes it easier to implement and integrate into the platform.

Performance: AES encryption algorithm is optimized for performance and can be implemented efficiently, which means it won't slow down the overall performance of the platform.

Overall, AES can provide strong security for consumer-to-consumer product trading and exchanging, helping to protect sensitive information and ensuring that transactions are secure and trustworthy. When it comes to consumer-to-consumer product trading and exchanging, AES can be used in several ways to ensure the security of sensitive information and protect against unauthorized access or tampering.

Together, SHA and AES are used to provide data integrity, confidentiality, and authenticity in C2C product trading and exchanging platforms. SHA is used to ensure that data is not tampered with during transmission, while AES is used to encrypt sensitive data to prevent unauthorized access. By using both algorithms, C2C product trading and exchanging platforms can provide a high level of security for user data, ensuring that user information is protected and secure.

5.3 TESTING

There are Various Level of Testing

- White Box Testing
- Black Box Testing
- Unit Testing
- Functional Testing
- Performance Testing

- Integration Testing
- Validation Testing
- System Testing
- Output Testing
- User Acceptance Testing

White Box Testing: White-box testing, sometimes called glass-box, is a test case design method that uses the control structure of the procedural design to derive test cases. Using White Box testing methods, we can derive test cases that

- Guarantee that all independent paths within a module have been exercised at least once.
- Exercise all logical decisions on their true and false sides.
- Execute all loops at their boundaries and within their operational bounds.
- Exercise internal data structures to assure their validity.

Black Box Testing: Black Box Testing is testing the software without any knowledge of the inner workings, structure or language of the module being tested. Black box tests, as most other kinds of tests, must be written from a definitive source document, such as specification or requirements document, such as specification or requirements document. It is a testing in which the software under test is treated, as a black box. You cannot “see” into it.The test provides inputs and responds to outputs without considering how the software works.In this testing by knowing the internal operation of a product, test can be conducted to ensure that “all gears mesh”, that is the internal operation performs according to specification and all internal components have been adequately exercised. It fundamentally focuses on the functional requirements of the software.

Unit Testing: Unit testing is a method by which individual units of source code, sets of one or more computer program modules together with associated control data, usage procedures, and operating procedures are tested to determine if they are fit for use. Intuitively, one can view a unit as the smallest testable part of an application. In procedural programming, a unit could be an entire module, but it is more commonly an individual function or procedure. In object-oriented programming, a unit is often an entire interface,such as a class, but could be an individual method. Unit tests are short code fragments created by programmers or occasionally by white box testers during the development process.It is a software verification and validation method in which the individual units of source code are tested fit for use. A unit is the smallest testable part of an application. In this testing, each class is tested to be working satisfactorily.Unit testing involves the design of test cases that validate that the internal program logic is functioning properly, and that program inputs produce valid outputs. All decision branches and internal code flow should be validated. It is the testing of individual software units of the application .it is done after the completion of an individual unit before integration.

Functional Testing: Functional testing is a quality assurance (QA) process and a type of black box testing that bases its test cases on the specifications of the software component under test. Functions are tested by feeding them input and examining the output, and internal program structure is rarely considered (not like in whitebox testing). Functional Testing usually describes what the system does. Functional testing differs from system testing in that functional testing "verifies a program by checking it against.design document(s) or specification(s)", while system testing "validate a program by checking it against the published user or system requirements" (Kane, Falk, Nguyen 1999, p. 52). Functional testing typically involves five steps. The identification of functions that the software is expected to perform

- The creation of input data based on the function's specifications
- The determination of output based on the function's specifications
- The execution of the test case
- The comparison of actual and expected outputs.

Performance Testing: In general testing performed to determine how a system performs in terms of responsiveness and stability under a particular workload. It can also serve to investigate, measure, validate or verify other quality attributes of the system, such as scalability, reliability and resource usage.Performance testing is a subset of

performance engineering, an emerging computer science practice which strives to build performance into the implementation, design and architecture of a system.
Integration Testing: Integration testing is a systematic technique for constructing the program structure while at the same time conducting tests to uncover errors associated with. Individual modules, which are highly prone to interface errors, should not be assumed to work instantly when put together. The problem of course, is “putting them together”- interfacing. There may be the chances of data lost across on another’s sub functions, when combined may not produce the desired major function; individually acceptable impression may be magnified to unacceptable levels; global data structures can present problems.

Integration testing is the phase in software testing in which individual software modules are combined and tested as a group. Integration testing takes as its input modules that have been unit tested, groups them in larger aggregates, applies tests defined in an integration test plan to those aggregates, and delivers as its output the integrated system ready. All the errors found in the system are corrected for the next phase.

The purpose of integration testing is to verify functional, performance, and reliability requirements placed on major design items. These "design items", i.e. assemblages (or groups of units), are exercised through their interfaces using black box testing, success and error cases being simulated via appropriate parameter and data inputs.
Simulated usage of shared data areas and inter-process communication is tested and individual subsystems are exercised through their input interface. Test cases are constructed to test whether all the components within assemblages interact correctly for example across procedure calls or process activations, and this is done after testing individual modules, i.e. unit testing

Validation Testing: Verification and Validation are independent procedures that are used together for checking that a product, service, or system meets requirements and specifications and that it full fills its intended purpose. These are critical components of a quality management system such as ISO 9000. The words "verification" and

"validation" are sometimes preceded with "Independent" (or IV&V), indicating that the verification and validation is to be performed by a disinterested third party.
It is sometimes said that validation can be expressed by the query "Are you building the right thing?" and verification by "Are you building it right?". In practice, the usage of these terms varies. Sometimes they are even used interchangeably.

System Testing: System testing of software or hardware is testing conducted on a complete, integrated system to evaluate the system's compliance with its specified requirements. System testing falls within the scope of black box testing, and as such, should require no knowledge of the inner design of the code or logic. As a rule, system testing takes, as its input, all of the "integrated" software components that have passed integration testing and also the software system itself integrated with any applicable hardware system(s). The purpose of integration testing is to detect any inconsistencies between the software units that are integrated together (called assemblages) or between any of the assemblages and the hardware.system testing is a more limited type of testing; it seeks to detect defects both within the "interassemblages" and also within the system as a whole.Testing is one of the important steps in the software development phase. Test cases are constructed to test whether all the components within assemblages interact correctly for example across procedure calls or process. . As a rule, system testing takes, as its input, all of the "integrated" software components that have passed integration testing.

Testing checks for the errors, as a whole of the project testing involves the following test cases:

- Static analysis is used to investigate the structural properties of the Source code.
- Dynamic testing is used to investigate the behavior of the source code by executing the program on the test data.

System testing is performed on the entire system in the context of a Functional Requirement Specification(s) (FRS) and/or a System Requirement Specification (SRS).

System testing tests not only the design, but also the behavior and even the believed expectations of the customer. It is also intended to test up to and beyond the bounds defined in the software/hardware requirements specification.
Output Testing: After performing the validation testing, next step is output testing of the proposed system since no system could be useful if it does not produce the required output generated or considered in to two ways. One is on screen and another is printed format. The output comes as the specified requirements by the user. Hence output testing does not result in any correction in the system.

User Acceptance Testing: User acceptance of a system is the factor for the success of any system. The system under consideration is tested for the user acceptance by constantly keeping in touch with the prospective system users at the
time of developing and making changes wherever required.

- Input screen design.
- Output screen design.
- Online message to guide user.
- Format of the ad-hoc reports and other outputs.

Taking various kinds of test data does the above testing. Preparation of test data plays a vital role in the system testing. After preparing the test data the system under study is tested using the test data. While testing the system by using test data errors are again uncovered and correct.

5.4 MODULES

User:

- Register & Login
- User Add Product
- Fix Price& Sale The Product
- Search Product

- Buy Product
- Make Payment

Admin:

- Login
- View Added Product
- Approve
- Get Commision
- Maintain Account Balance

Register & Login:

This is the first module in our project, here symbolizes a unit of work performed within a database management system (or similar system) against a database, and treated in a coherent and reliable way independent of other transactions. A transaction generally represents any change in database user will transfer the amount to provider.

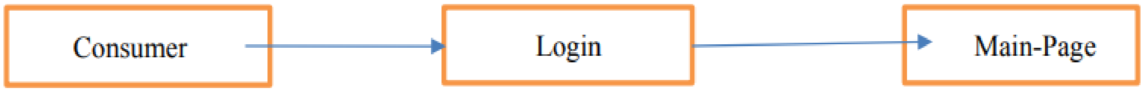

Fig 5.1: Register Login

User Add Product:

In this module is used to help to the user to add the product with the full description about that product and the user will update the report along with their opinion and the will be stored the database.

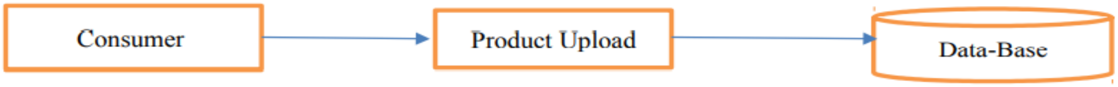

Fig 5.2: Add Product

Search The Product:

In this module is used to user can buy the product in same web application what kind of product used need to buy.

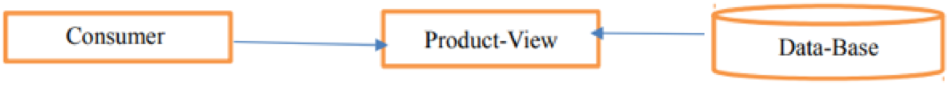

Fig 5.3: Buy Products

Buy Product:

In this module is used to user can buy the product in same web application what kind of product used need to buy.

Make Payment:

In this module the Consumer will make the payment to another consumer's product file. Consumer will be responsible for your Payment stored in database.

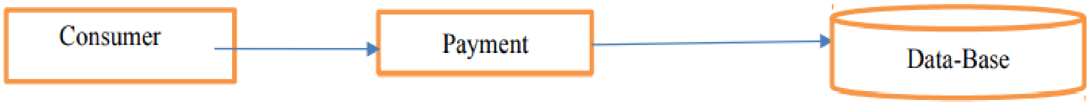

Fig 5.4: Payment View

View Added Product:

In this module is used to help admin view the user added product for sale.That product's fixed some amount in user. But the admin need commission for that product.

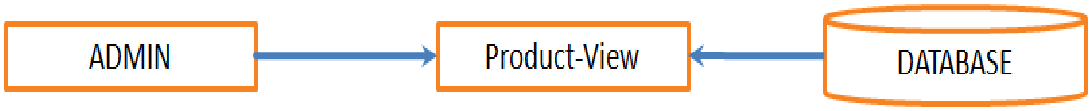

Fig 5.5: Product View

Get Commision:

In this module is used to help admin after approve the product he can fix the commission for his website.

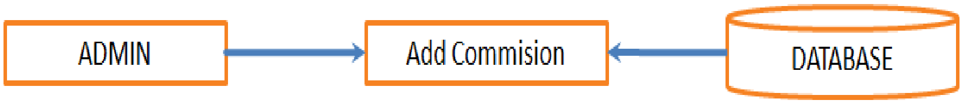

Fig 5.6: Fix Commission

Module Diagram:

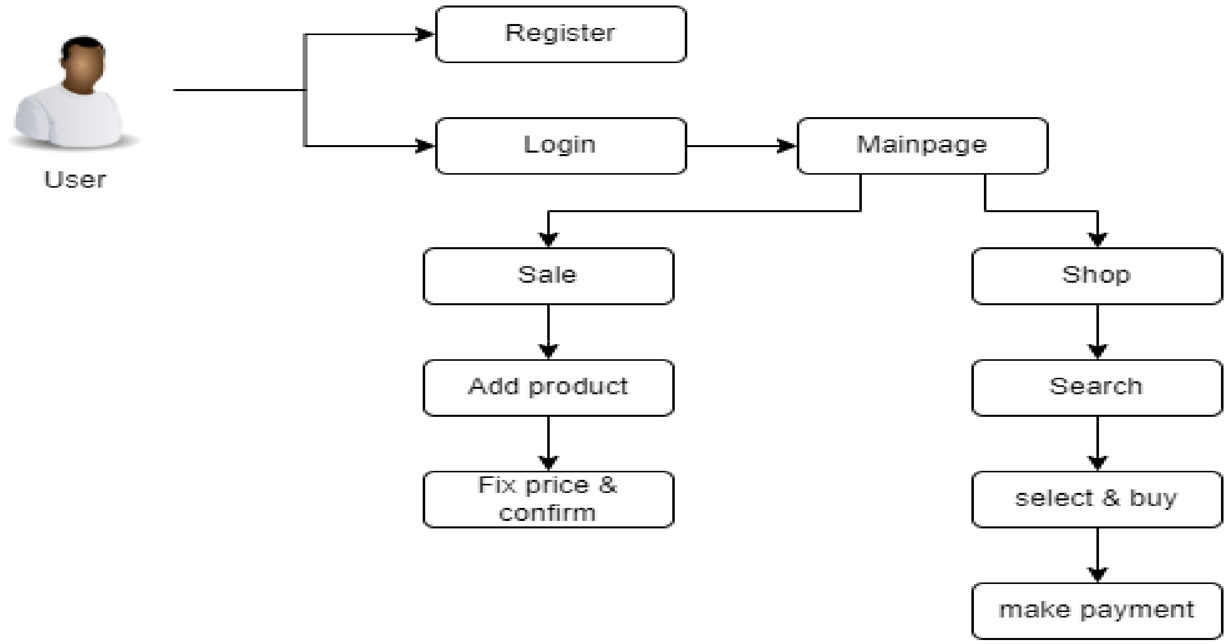

Fig 5.7: Overview of User Diagram

Admin Diagram:

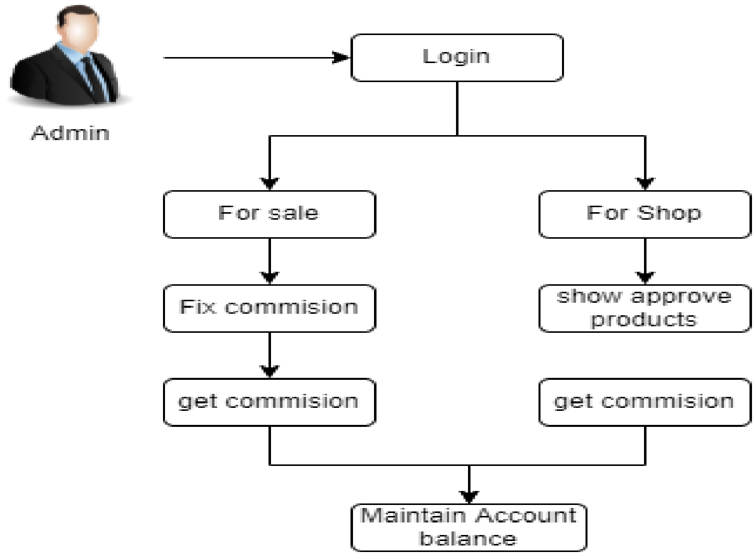

Fig 5.8: Overview of Admin Diagram

Entity Relationship Diagram:

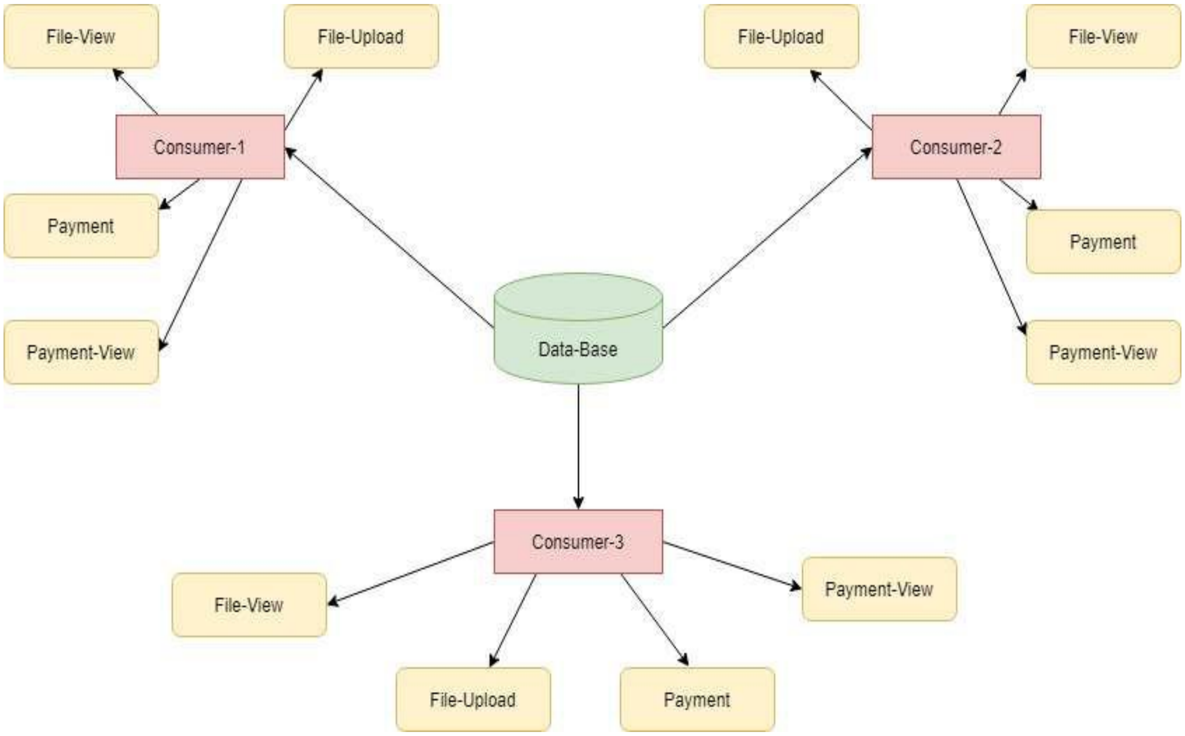

Fig 5.9: ER Diagram

Explanation:

This ER diagram represents a C2C (consumer-to-consumer) e-commerce platform, where users can buy and sell products with each other. Let's go through each entity and relationship:

User: Represents a user of the platform. The entity has attributes such as user_id (a unique identifier for each user), name, email, password, and profile_picture. The primary key is user_id.

Product: Represents a product that a user can sell on the platform. The entity has attributes such as product_id (a unique identifier for each product), name, description, price, condition, category, and status. The primary key is product_id.

Transaction: Represents a transaction between a buyer and a seller. The entity has attributes such as transaction_id (a unique identifier for each transaction), buyer_id (a foreign key referencing the user_id of the buyer), seller_id (a foreign key referencing the user_id of the seller), product_id (a foreign key referencing the product_id of the product being sold), date, amount, and status. The primary key is transaction_id.

Feedback: Represents feedback that a user can leave for another user after a transaction. The entity has attributes such as feedback_id (a unique identifier for each feedback), transaction_id (a foreign key referencing the transaction_id of the transaction being reviewed), reviewer_id (a foreign key referencing the user_id of the user leaving the review), reviewee_id (a foreign key referencing the user_id of the user being reviewed), rating, and comment. The primary key is feedback_id.

Message: Represents a message sent between two users on the platform. The entity has attributes such as message_id (a unique identifier for each message), sender_id (a foreign key referencing the user_id of the user sending the message), receiver_id (a foreign key referencing the user_id of the user receiving the message), message, and date. The primary key is message_id.

There are also several relationships between these entities:

One-to-Many User-Product: A user can sell multiple products, but each product is sold by only one user. This is represented by the one-to-many relationship between User and Product.

One-to-Many User-Transaction: A user can be both a buyer and a seller in multiple transactions, but each transaction involves only one buyer and one seller. This is represented by the one-to-many relationship between User and Transaction, with buyer_id and seller_id as foreign keys.

Many-to-One Transaction-Product: A product can be involved in multiple transactions, but each transaction involves only one product. This is represented by the many-to-one relationship between Transaction and Product, with product_id as a foreign key.

Many-to-One Transaction-User: A user can be both a buyer and a seller in multiple transactions, but each transaction involves only one buyer and one seller.

This is represented by the many-to-one relationship between Transaction and User, with buyer_id and seller_id as foreign keys.

One-to-Many User-Feedback: A user can leave multiple feedbacks for other users, but each feedback is left for only one user. This is represented by the one-to-many relationship between User and Feedback, with reviewer_id and reviewee_id as

Improved Communication: ER diagrams can help to improve communication between stakeholders by providing a clear and concise way of representing the relationships between different entities in the system. This can help to ensure that everyone involved in the project has a shared understanding of the system's data model.

Enhanced Data Quality: ER diagrams can help to ensure data quality by identifying potential data redundancies, inconsistencies, and errors. By identifying these issues early, developers can take steps to ensure that the system's data is accurate and reliable.

Easier System Maintenance: ER diagrams can help to make system maintenance easier by providing a clear view of the system's data model. This can help developers to identify which parts of the system are affected by changes and to make those changes more efficiently.

Improved System Performance: ER diagrams can help to improve system performance by providing a clear view of the relationships between different entities in the system. By optimizing the database structure based on these relationships, developers can improve the system's performance and reduce the time required for data retrieval and storage.

Scalability: ER diagrams can help to ensure that the system is scalable by providing a clear view of the relationships between different entities. This can help developers to design the system in such a way that it can handle increased user demand.

CHAPTER 6
RESULTS AND DISCUSSION

Consumer-to-consumer product trading and exchanging is a process in which individuals buy, sell or exchange products or services directly with each other, without the need for intermediaries like retailers or wholesalers. This process has become increasingly popular in recent years, thanks to the growth of online marketplaces, classifieds websites, and social media platforms.One of the main advantages of consumer-to-consumer product trading and exchanging is that it can offer a more personalized and flexible buying or selling experience. For buyers, it can provide access to unique or hard-to-find products that may not be available through traditional retailers. For sellers, it can provide an opportunity to monetize unused or unwanted goods or services.

However, there are also some potential drawbacks to consider. Consumer-to-consumer transactions may not always provide the same level of consumer protection as transactions with established businesses. There may be a risk of fraud or misrepresentation, and the quality of the product may not be guaranteed. Additionally, there may be logistical challenges, such as coordinating payment and shipping arrangements.

Overall, consumer-to-consumer product trading and exchanging can be a useful option for individuals seeking to buy or sell goods or services, but it is important to take appropriate precautions to ensure a successful and safe transaction. This can include verifying the identity of the other party, using secure payment methods, and carefully examining the product's condition before making a purchase.Scalability: A successful C2C product trading and exchanging platform should be scalable to accommodate a growing number of users and transactions. Java and its associated technologies are known for their ability to handle high traffic, and databases like SQL and NoSQL can efficiently manage large amounts of data.

User Experience: The user experience is essential for a C2C product trading and exchanging platform. The platform should be intuitive and user-friendly, with a simple and attractive design. Java and JavaScript can be used to develop dynamic and interactive user interfaces, while HTML and CSS can provide the look and feel of the platform.

Security: The security of the platform is crucial, and Java's built-in security features can be leveraged to ensure data protection. SQL and NoSQL can be used to store and manage user data securely, and encryption algorithms such as AES and SHA can be used to protect sensitive data.

Performance: The performance of the platform is critical to ensure that users can browse and search for products quickly and efficiently. Java's speed and efficiency, along with SQL and NoSQL's ability to manage large data sets, can contribute to the platform's overall performance.

Maintenance: Maintaining a C2C product trading and exchanging platform can be challenging, but Java and its associated technologies make it easier. The platform can be maintained and updated using a variety of tools and frameworks, such as Eclipse, NetBeans, and Spring.

Thanks to the rise of online markets, classified websites, and social media platforms, this technique has gained popularity over the past several years.Consumer-to-consumer product exchanges and trading can provide a more individualised and adaptable buying or selling experience, which is one of its key benefits. It can give customers access to rare or difficult-to-find goods that would not be offered by conventional stores. For vendors, it may provide a chance to profit from unsold or undesired products or services.It can provide access to unique or hard-to-find products that may not be available through traditional retailers. For sellers, it can provide an opportunity to monetize unused or unwanted goods or services.

CHAPTER 7
CONCLUSION

There are numerous online trading platforms available today. However, they have a number of flaws that university students who simply want a basic, yet intelligent, and user-friendly platform for trading on campus do not appreciate (or within a small community).Consumer-to-consumer could be a source of communication for companies to Customers, and the simplest way to solve Customers' problems through a community effort. Companies can find out future trends, and might work towards zero complaints by understanding Customer issues, and ensuring Customer problems do not re-occur.

Consumer-to-Consumer is that the buying and selling of products and services, or the transmitting of funds or data, over an system, primarily the web. These business transactions occur either as business-to-business (B2B), business-to-consumer (B2C), consumer-to-consumer or consumer-to-business. The recommender system would then recommend sale items to the potential buyer. Overall, the platform targeted for direct consumer-to-consumer trading would be more intelligent, simpler-to-use and more user friendly.

By utilizing Java and its associated technologies, developers can build a platform that is highly efficient and can handle a high volume of traffic. The user experience can be enhanced by using JavaScript, HTML, and CSS to create an interactive and attractive interface. SQL and NoSQL databases can be used to manage large data sets and ensure data security. Encryption algorithms like AES and SHA can also be used to protect sensitive data.The project can be maintained and updated efficiently using various tools and frameworks, such as Eclipse which can make the platform more adaptable and scalable. Exchanging nearby don't appreciate (or inside a little community).Consumer-to-purchaser could be a wellspring of correspondence for organizations to Clients,

Overall, this project has the potential to create a reliable and secure platform for C2C product trading and exchanging that can offer users a seamless experience, while also providing a stable and efficient platform for sellers to connect with buyers.

In conclusion, a C2C product trading and exchanging platform using Java full stack, JavaScript, HTML, CSS, JSP, SQL, and NoSQL can be highly effective in providing a secure, scalable, and user-friendly platform for buying and selling products. By leveraging these technologies, a platform can be developed that is both functional and appealing to users while providing a high level of security and performance.

7.1 FUTURE WORK

Advanced Security Features: While the project already includes encryption algorithms such as AES and SHA for data protection, there is always room for improvement in security. Future work could explore the use of more advanced security features, such as biometric authentication, to ensure even stronger protection of sensitive user data.

Machine Learning: Integrating machine learning algorithms into the platform can enhance the user experience by providing personalized product recommendations, based on user preferences and purchase history. This can help to create a more engaging and customized experience for users, which could lead to increased engagement and sales.

Integration with Social Media: Social media is a powerful tool for promoting products and connecting with potential buyers. Integrating the platform with social media channels, such as Facebook or Instagram, could help sellers to reach a wider audience and increase their chances of making a sale.

Mobile Optimization: As more and more users access the internet through their mobile devices, it is important to ensure that the platform is optimized for mobile use. Future work could focus on creating a mobile-friendly version of the platform that provides a seamless experience for users on the go.

Advanced Analytics: By leveraging advanced analytics tools, such as data visualization or predictive modeling, the platform can gain valuable insights into user behavior, which can help to inform future business decisions. This can include identifying popular products, understanding user preferences, and optimizing the platform to improve user engagement and sales.

7.2 RESEARCH ISSUES

One research issue that could be explored in the context of C2C product trading and exchanging is the impact of trust and reputation systems on buyer behavior.

Trust and reputation systems are designed to provide buyers with a sense of security when making purchases from unknown sellers. These systems typically allow buyers to rate and review sellers based on their experiences, providing valuable feedback for future buyers.

However, the effectiveness of these systems in building trust and encouraging sales is not yet fully understood. For example, it is unclear how much weight buyers place on these ratings and reviews when making purchasing decisions, or how much they influence the overall success of a seller on the platform.

Future research could explore the impact of trust and reputation systems on buyer behavior by analyzing transaction data and conducting surveys or interviews with buyers. This research could help to identify best practices for implementing these systems in C2C product trading and exchanging platforms, and could help to inform future platform development.

7.3 IMPLEMENTATION ISSUES

Integrating different technologies and platforms can be complex and challenging, especially when it comes to data management and security. For example, managing user data and transactions across different databases and platforms can be difficult and require careful planning to ensure data consistency and security.

Use a consistent development approach: Using a consistent development approach, such as agile or DevOps, can help to ensure that all team members are on the same page and working towards the same goals.

Use standard interfaces: Using standard interfaces, such as RESTful APIs, can help to simplify integration and ensure that different components of the system can communicate effectively with each other.Implement a centralized data management system: Implementing a centralized data management system, such as a data warehouse, can help to ensure data consistency and security by providing a single source of truth for all user data and transactions.

Use encryption and security protocols: Implementing encryption and security protocols, such as SHA & AES algorithms, can help to ensure the security and integrity of user data and transactions across different platforms and technologies.Regularly testing and monitoring the system can help to identify any integration issues and ensure that the system is working as intended.

Overall, integrating and managing different technologies and platforms can be a complex and challenging task, but with careful planning and the right strategies, developers can ensure that the system is secure, reliable, and able to handle the demands of C2C product trading and exchanging. Coordinating various advances and stages can be complicated and testing, particularly with regards to information the board and security. For instance, overseeing client information and exchanges across various data sets and stages can be troublesome and require cautious intending to guarantee information consistency and security. Executing encryption and security conventions, like SHA and AES calculations, can assist with guaranteeing the security and uprightness of client information and exchanges across various stages and technologies.Regularly testing and observing the framework can assist with distinguishing any joining issues and guarantee that the framework is filling in as planned. . Coordinating various advances and stages can be complicated and testing, particularly with regards to information the board and security. security and integrity of user data and transactions across different platforms and technologies.

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APPENDIX

A.SOURCE CODE

```
<meta http-equiv="X-UA-Compatible" content="IE=edge">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <link rel="stylesheet" href="style.css">
    <title>HomePage</title>
</head>
<style>
@import
url('https://fonts.googleapis.com/css2?family=Public+Sans:wght@300;400&displa
y=swap');

* {
    margin: 0;
    padding: 0;
    box-sizing: border-box;
    outline: none;
    text-decoration: none;
}

body {
    font-family: 'Public Sans', sans-serif;
}

.padding-lr {
    padding: 40px 30px;
}

.padding-lg {
    padding: 60px 40px;
}

.padding-tb {
    padding: 50px 0;
}

.container {
    max-width: 1024px;
    margin: 0 auto;
}

.header {
    background: #510f6f;
}

nav {
    display: flex;
    align-items: center;
    justify-content: space-between;
    padding: 20px 0;
}
```

```css
nav .logo {
    font-size: 24px;
    color: #f9faf8;
}

nav .navbar ul {
    display: flex;
    list-style: none;
}

nav .navbar ul li {
    margin-right: 15px;
}

nav .navbar ul li:last-child {
    margin-right: 0;
}

nav .navbar ul li a {
    text-decoration: none;
    font-size: 18px;
    color: #e5e7eb;
}

/** End Navbar **/

.hero {
    padding: 100px 0;
    display: flex;
    align-items: center;
    justify-content: space-between;
    gap: 30px;

}

.hero .hero-content  {
    flex: 1;
    display: flex;
    flex-direction: column;
    align-items: flex-start;
}

.hero .hero-content .hero-header {
    font-size: 48px;
    font-weight: bold;
    color: #f9faf8;
}

.hero .hero-content .hero-desc {
    font-size: 20px;
    color: #f9faf8;
    margin: 15px 0;
}

.hero .hero-img {
    flex: 1;
}

.hero .hero-img img {
    width: 100%;
}

.hero .hero-content .btn {
    display: block;
    padding: 10px 30px;
    border-radius: 5px;
    border: none;
    background-color: #3882f6;
    color: #f9faf8;
    font-size: 18px;
    font-weight: 300;
    text-transform: uppercase;
}

/** End Hero **/

.about {
    display: flex;
    align-items: center;
    flex-direction: column;
}

.about-header {
    text-align: center;
    margin-bottom: 30px;
    font-size: 36px;
    color: #1f2937;
    text-transform: uppercase;
    font-weight: bold;
}

.about-content {
    display: flex;
    align-items: center;
    justify-content: space-between;
    gap: 20px;
}

.about-content .box {
    flex: 1;
    text-align: center;
}

.about-content .box .box-img img {
    width: 100%;
}

/** End About **/

.slogan {
    background-color: #e5e7eb;
}
```

```
.slogan-content {
    display: flex;
    align-items: center;
    justify-content: space-between;
    flex-direction: column;
}

.slogan-content .slogan-text {
    font-size: 30px;
    font-weight: lighter;
    font-style: italic;
    color: #1f2937;
}

.slogan-content .author {
    font-size: 18px;
    font-weight: bold;
    color: #1f2937;
    align-self: flex-end;
}

.footer-wrapper {
    display: flex;
    align-items: center;
    justify-content: space-around;
    padding: 30px;
    gap: 200px;
    background-color: #3882f6;
    border-radius: 5px;
}

.footer-header {
    font-size: 20px;
    color: #f9faf8;
}

.footer-desc {
    font-size: 18px;
    color: #e5e7eb;
    font-weight: lighter;
}

.footer-btn .secondary-btn {
    display: block;
    padding: 10px 40px;
    background-color: transparent;
    border: 2px solid #f9faf8;
    border-radius: 10px;
    font-size: 15px;
    color: #e5e7eb;
    text-transform: uppercase;
    font-weight: bold;
}


</style>
<body>
```

```
  <section class="header">
    <div class="container">
      <nav>
        <div class="logo"><h1>Product Exchanging & Trading</h1></div>
        <div class="navbar">
          <ul>
            <li><a href="#">Home</a></li>
            <li> <a href="adminlog.jsp"
target="_blank">Admin</a></li>
            <li><a href="consumer1log.jsp"
target="_blank">Customer</a></li>




          </ul>
        </div>
      </nav>

      <div class="hero">
        <div class="hero-content">
          <div class="hero-header">Buy, sell and find just about
anything using this website.</div>
          <p class="hero-desc">
            Top brands for Phones and Electronics. Latest trends
in Fashion. Free Shipping available* No Cost EMI Available. Best Deals. Easy
& Fast Delivery. Top Brands. Huge Selection. Great Offers. Low Prices.
          </p>
           <a text-decoration="none" href="consumer1reg.jsp"
target="_blank" > <button class="btn" type="submit">Sign up</button></a>

        </div>
        <div class="hero-img">
          <img src="https://img.freepik.com/free-vector/3d-
isometric-e-commerce-site-online-store_1441-2142.jpg">
        </div>
      </div>
    </div>
  </section>

  <section class="about">
    <div class="container padding-lr">
      <div class="about-header">
        <h1>About us</h1>
      </div>
      <div class="about-content">
        <div class="box">
          <div class="box-img"><img
src="https://pwpblog.wpengine.com/wp-content/uploads/2022/08/Ecommerce-
Website-Promotion_Final.png"></div>
          <p>this is some subtext under an illustration or
image</p>
        </div>
        <div class="box">
          <div class="box-img"><img src="https://xdfile.com/wp-
content/uploads/2021/03/eCommerce-Website-UI-Kit-Template-for-XD.jpg"></div>
```

```
                    <p>this is some subtext under an illustration or
image</p>
                </div>
                <div class="box">
                    <div class="box-img"><img
src="https://images.pexels.com/photos/196659/pexels-photo-
196659.jpeg?auto=compress&cs=tinysrgb&w=1260&h=750&dpr=1" alt=""></div>
                    <p>this is some subtext under an illustration or
image</p>
                </div>
                <div class="box">
                    <div class="box-img"><img
src="https://images.pexels.com/photos/1181467/pexels-photo-
1181467.jpeg?auto=compress&cs=tinysrgb&w=1260&h=750&dpr=1" alt=""></div>
                    <p>this is some subtext under an illustration or
image</p>
                </div>
            </div>
        </div>
    </section>

    <section class="slogan">
        <div class="container padding-lg">
            <div class="slogan-content">
                <p class="slogan-text">This is an inspiring quote or a
testimonial from a customer. Maybe it's just filling up space, or marbe
people will actually read it. Who knows? All i know is that it looks
nice.</p>
            <span class="author">-Thor, God of Thunder</span>
            </div>
        </div>
    </section>

    <footer class="footer">
        <div class="container padding-tb">
            <div class="footer-wrapper">
                <div class="footer-content">
                    <div class="footer-text">
                        <p class="footer-header">Call to action!!! It's
time!</p>
                        <p class="footer-desc">Sign up for our product by
clicking that button right over there !</p>
                    </div>
                </div>
                <div class="footer-btn">
                    <button class="secondary-btn">Sign up</button>
                </div>
            </div>
        </div>
    </footer>

</body>
</html>


<%-- <%@ page language="java" contentType="text/html; charset=ISO-8859-1"
    pageEncoding="ISO-8859-1"%>
```

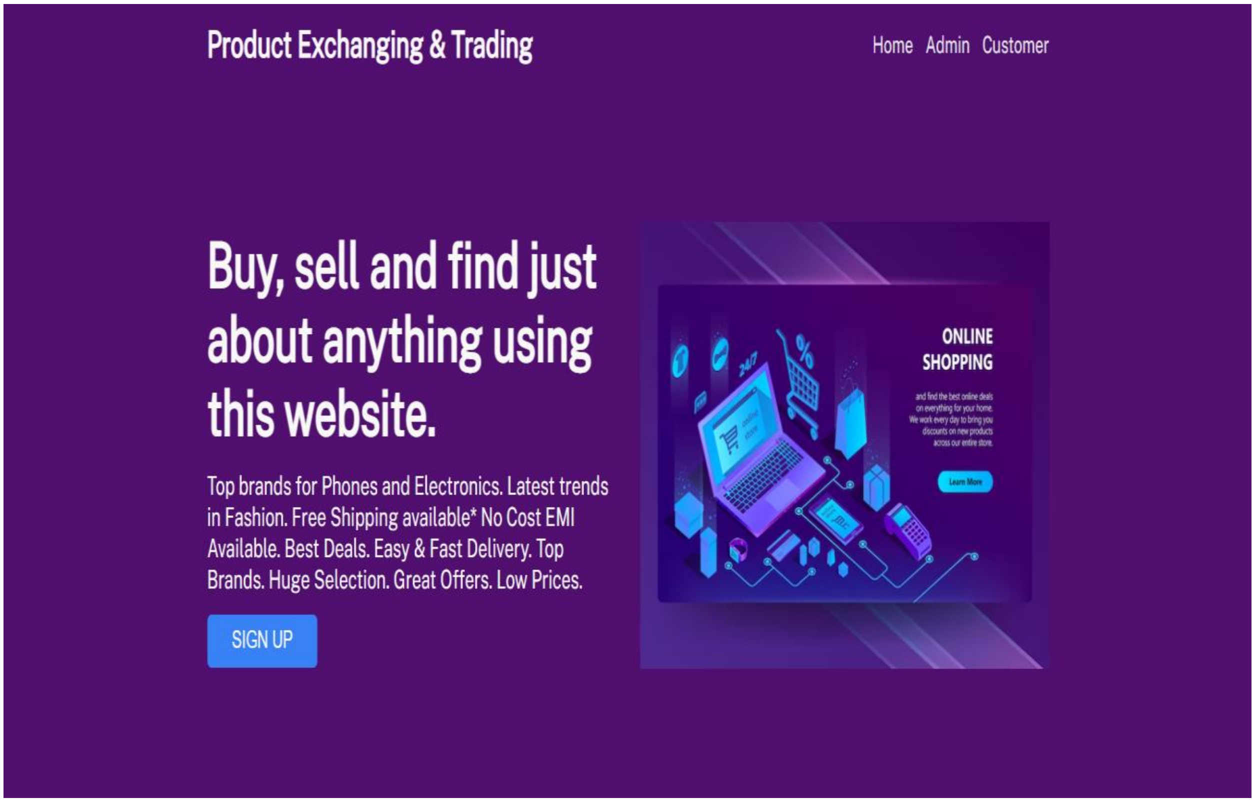
```
<!DOCTYPE html PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
<html>
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1">
<title>Indexpage</title>
<link rel="stylesheet" href="css1/homepage.css">

</head>
<style>
body{
background-image:url(images/h3.img.webp);
background-size:1600px 690px;

}

</style>


<body id="main">
      <div id="menu">
            <div class="container">
                  <div id="logo">
        <p>c2c</p>
                  </div>
                  <div id='menuStripes'>
                        <a href="#menuPlate">
                              <button>
                                    <div class="stripe"></div>
                                    <div class="stripe"></div>
                                    <div class="stripe"></div>
                              </button>
                        </a>
                  </div>
            </div>
      </div>
      <div id="menuPlate">
            <div class="container">
                  <div id="menuHidden">
                        <div></div>
                        <div class="button">
                        <a href="#main">
                                    close
                        </a>
                        </div>
                  </div>
                  <div class="openMenu">
                  <ul>
                        <li>
                              <a href="adminlog.jsp">
                                    Admin</a>
                              </li>


                        <li>
                              <a href="consumer1log.jsp">
                                    User
```

```
                </a>
            </li>


        </ul>
        </div>
    </div>
```

```
 package servlet;


import java.security.Key;

import javax.crypto.Cipher;
import javax.crypto.spec.SecretKeySpec;

import sun.misc.*;

public class AES
{
private static String algorithm = "AES";
private static byte[] keyValue=new byte[]
{ 'A', 'S', 'e', 'c', 'u', 'r', 'e', 'S', 'e', 'c', 'r', 'e', 't', 'K', 'e', 'y' };

    // Performs Encryption
    public static String encrypt99(String plainText) throws Exception
    {
        Key key = generateKey();
        Cipher chiper = Cipher.getInstance(algorithm);
        chiper.init(Cipher.ENCRYPT_MODE, key);
        byte[] encVal = chiper.doFinal(plainText.getBytes());
        String encryptedValue = new BASE64Encoder().encode(encVal);
        return encryptedValue;
    }

    // Performs decryption
    public static String decrypt(String encryptedText) throws Exception
    {
        // generate key
        Key key = generateKey();
        Cipher chiper = Cipher.getInstance(algorithm);
        chiper.init(Cipher.DECRYPT_MODE, key);
```

```
            byte[] decordedValue = new BASE64Decoder().decodeBuffer(encryptedText);
            byte[] decValue = chiper.doFinal(decordedValue);
            String decryptedValue = new String(decValue);
            return decryptedValue;
        }

//generateKey() is used to generate a secret key for AES algorithm
        private static Key generateKey() throws Exception
        {
            Key key = new SecretKeySpec(keyValue, algorithm);
            return key;
        }


}
```

B.SCREENSHOTS

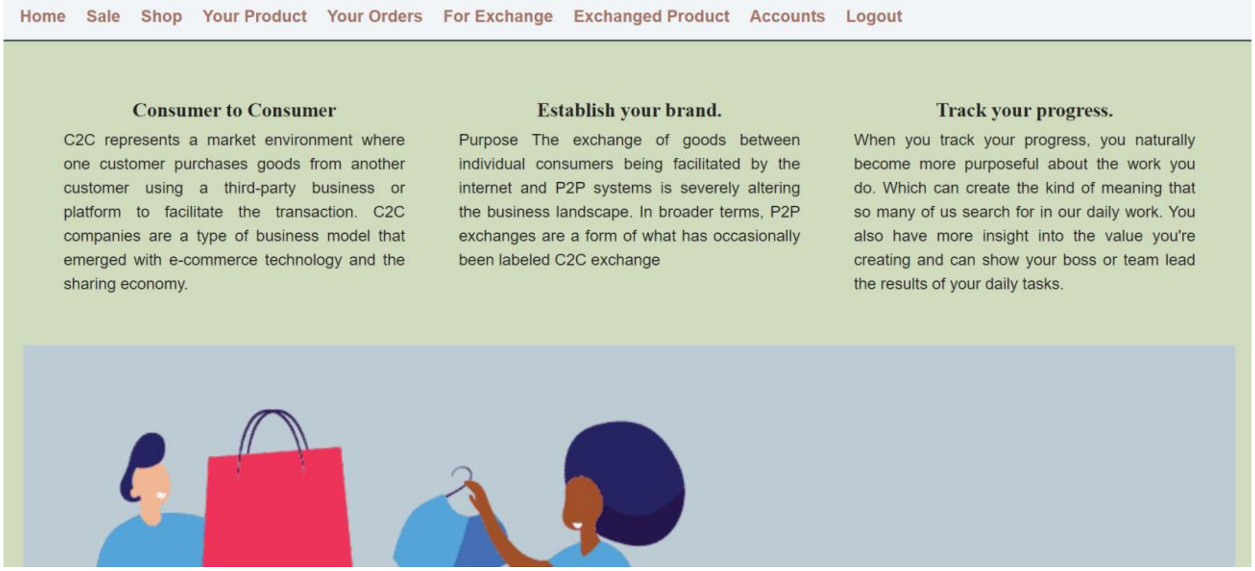


Buy, sell and find just about anything using this website.

Top brands for Phones and Electronics. Latest trends in Fashion. Free Shipping available* No Cost EMI Available. Best Deals. Easy & Fast Delivery. Top Brands. Huge Selection. Great Offers. Low Prices.

and find the best online deals on everything for your home. We work every day to bring you discounts on new products across our entire store.

Figure B-1: Home Page



Home Sale Shop Your Product Your Orders For Exchange Exchanged Product Accounts Logout

Consumer to Consumer

C2C represents a market environment where one customer purchases goods from another customer using a third-party business or platform to facilitate the transaction. C2C companies are a type of business model that emerged with e-commerce technology and the sharing economy.

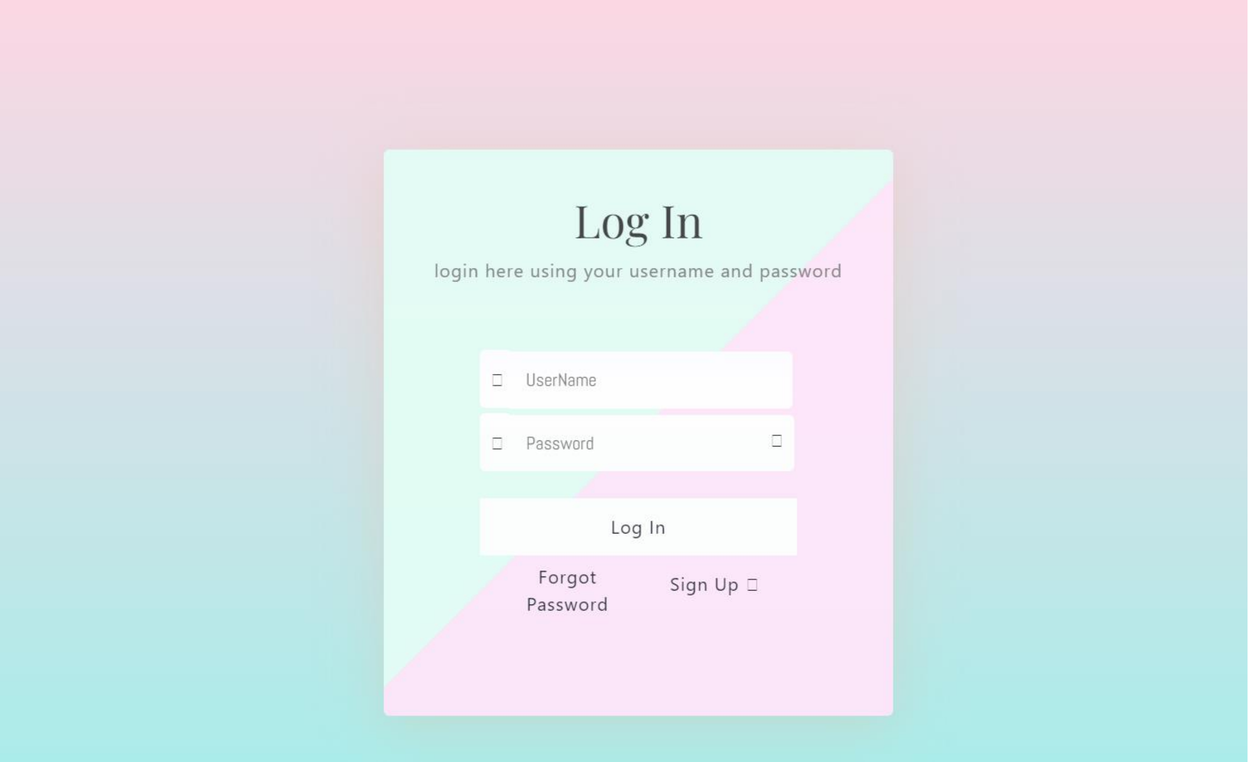
Establish your brand.

Purpose The exchange of goods between individual consumers being facilitated by the internet and P2P systems is severely altering the business landscape. In broader terms, P2P exchanges are a form of what has occasionally been labeled C2C exchange

Track your progress.

When you track your progress, you naturally become more purposeful about the work you do. Which can create the kind of meaning that so many of us search for in our daily work. You also have more insight into the value you're creating and can show your boss or team lead the results of your daily tasks.

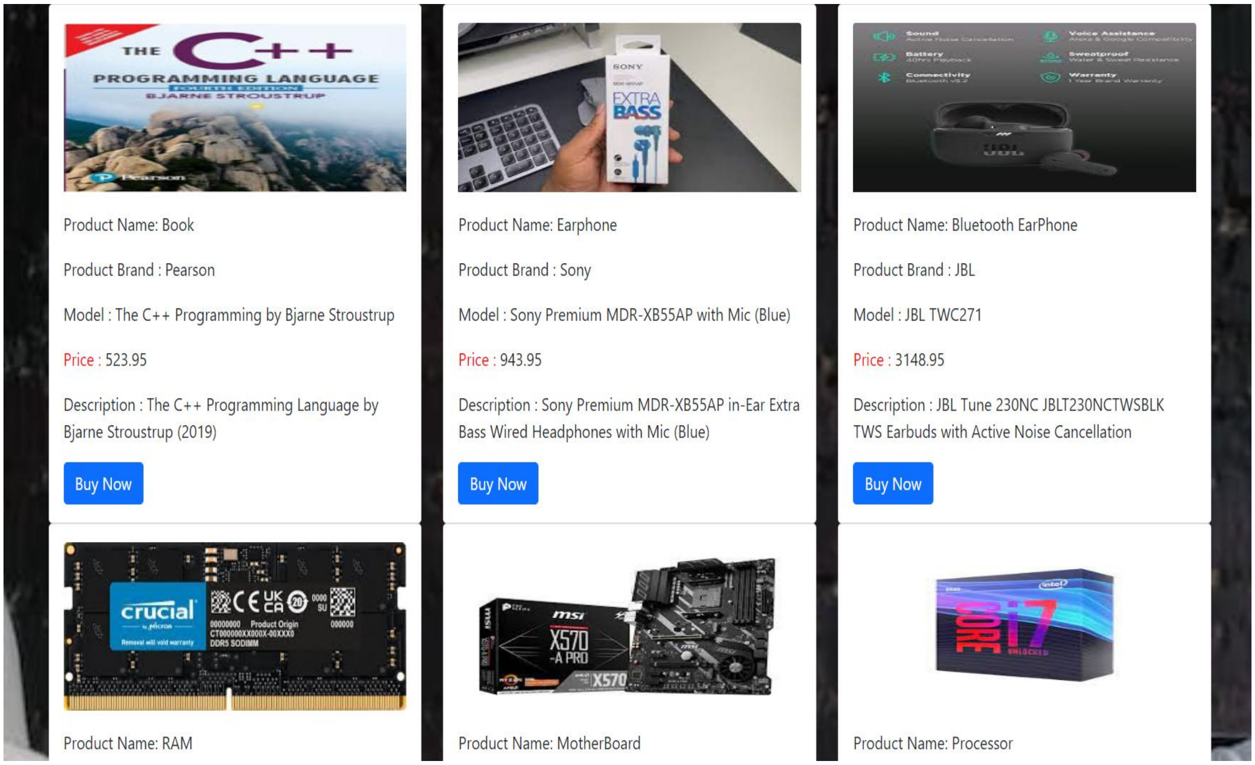
Figure B-2: Customer Page



Log In

login here using your username and password

Figure B-3: Admin Login Page



Product Name: Book

Product Brand : Pearson

Model : The C++ Programming by Bjarne Stroustrup

Price : 523.95

Description : The C++ Programming Language by Bjarne Stroustrup (2019)

Product Name: Earphone

Product Brand : Sony

Model : Sony Premium MDR-XB55AP with Mic (Blue)

Price : 943.95

Description : Sony Premium MDR-XB55AP in-Ear Extra Bass Wired Headphones with Mic (Blue)

Product Name: Bluetooth EarPhone

Product Brand : JBL

Model : JBL TWC271

Price : 3148.95

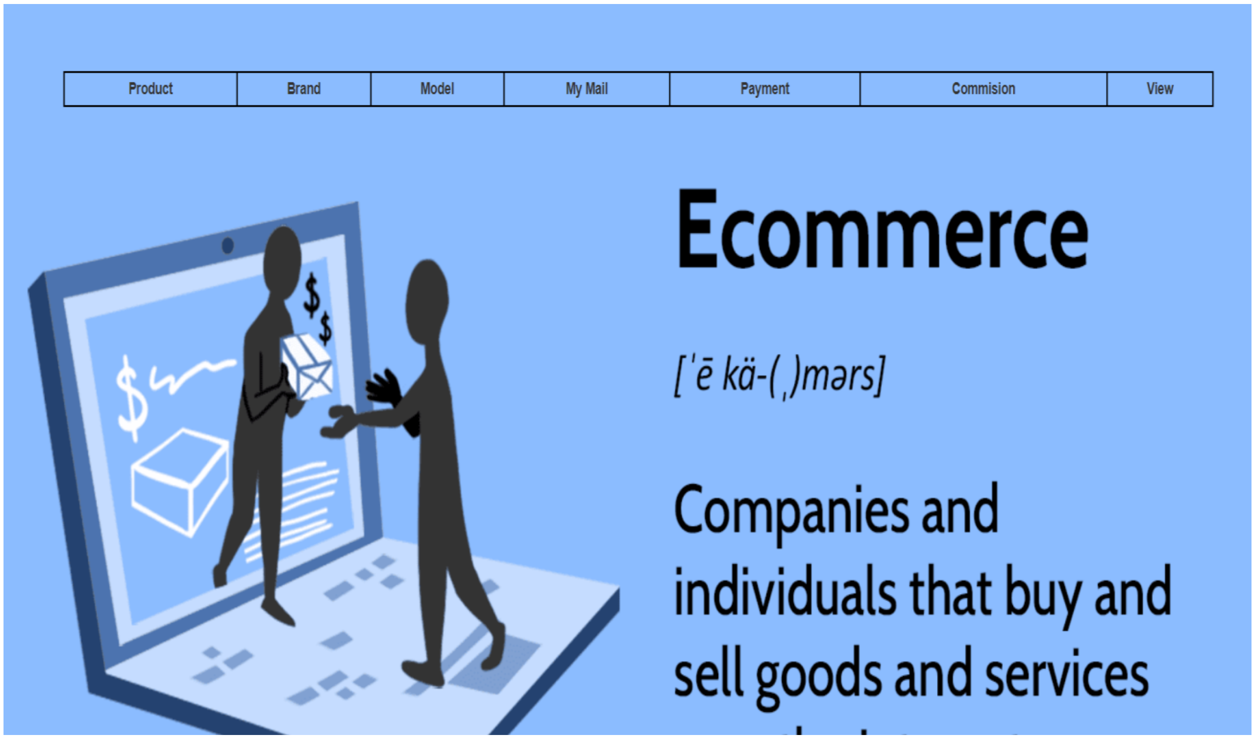
Description : JBL Tune 230NC JBLT230NCTWSBLK TWS Earbuds with Active Noise Cancellation

Product Name: RAM

Product Name: MotherBoard

Product Name: Processor

Figure B-4: Add Product

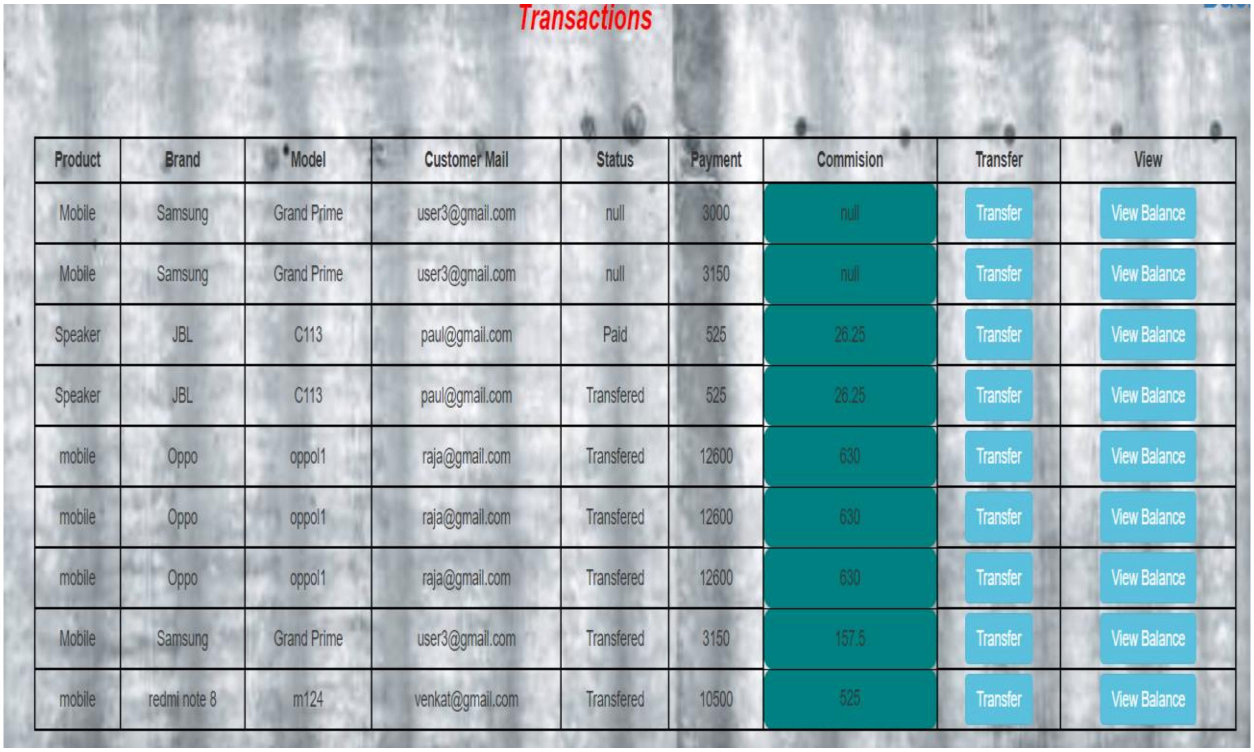


Ecommerce

[ˈē kä-(ˌ)mərs]

Companies and individuals that buy and sell goods and services

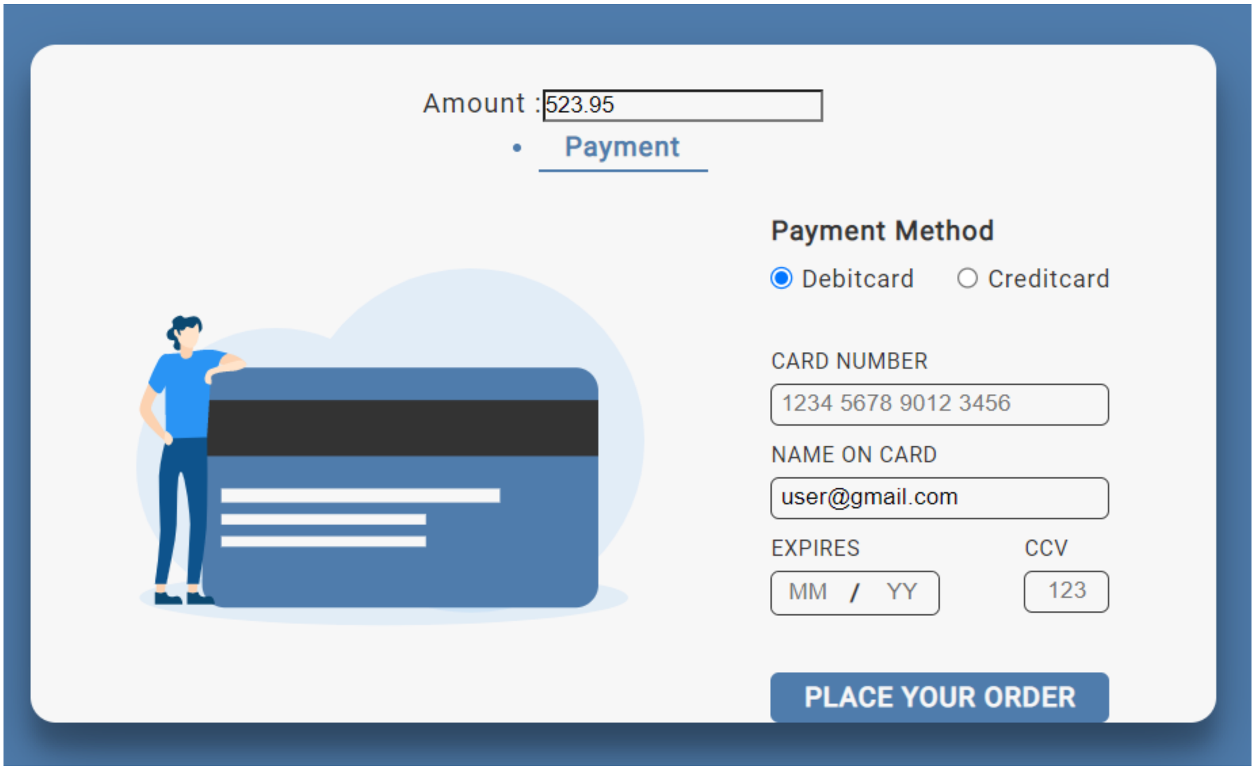
Figure B-5: Transaction History



Transactions

Product	Brand	Model	Customer Mail	Status	Payment	Commision	Transfer	View
Mobile	Samsung	Grand Prime	user3@gmail.com	null	3000	null	Transfer	View Balance
Mobile	Samsung	Grand Prime	user3@gmail.com	null	3150	null	Transfer	View Balance
Speaker	JBL	C113	paul@gmail.com	Paid	525	26.25	Transfer	View Balance
Speaker	JBL	C113	paul@gmail.com	Transfered	525	26.25	Transfer	View Balance
mobile	Oppo	oppol1	raja@gmail.com	Transfered	12600	630	Transfer	View Balance
mobile	Oppo	oppol1	raja@gmail.com	Transfered	12600	630	Transfer	View Balance
mobile	Oppo	oppol1	raja@gmail.com	Transfered	12600	630	Transfer	View Balance
Mobile	Samsung	Grand Prime	user3@gmail.com	Transfered	3150	157.5	Transfer	View Balance
mobile	redmi note 8	m124	venkat@gmail.com	Transfered	10500	525	Transfer	View Balance

Figure B-6: Payment Transfer Page



Amount : 523.95

Payment

Payment Method

● Debitcard ○ Creditcard

CARD NUMBER

1234 5678 9012 3456

NAME ON CARD

user@gmail.com

EXPIRES

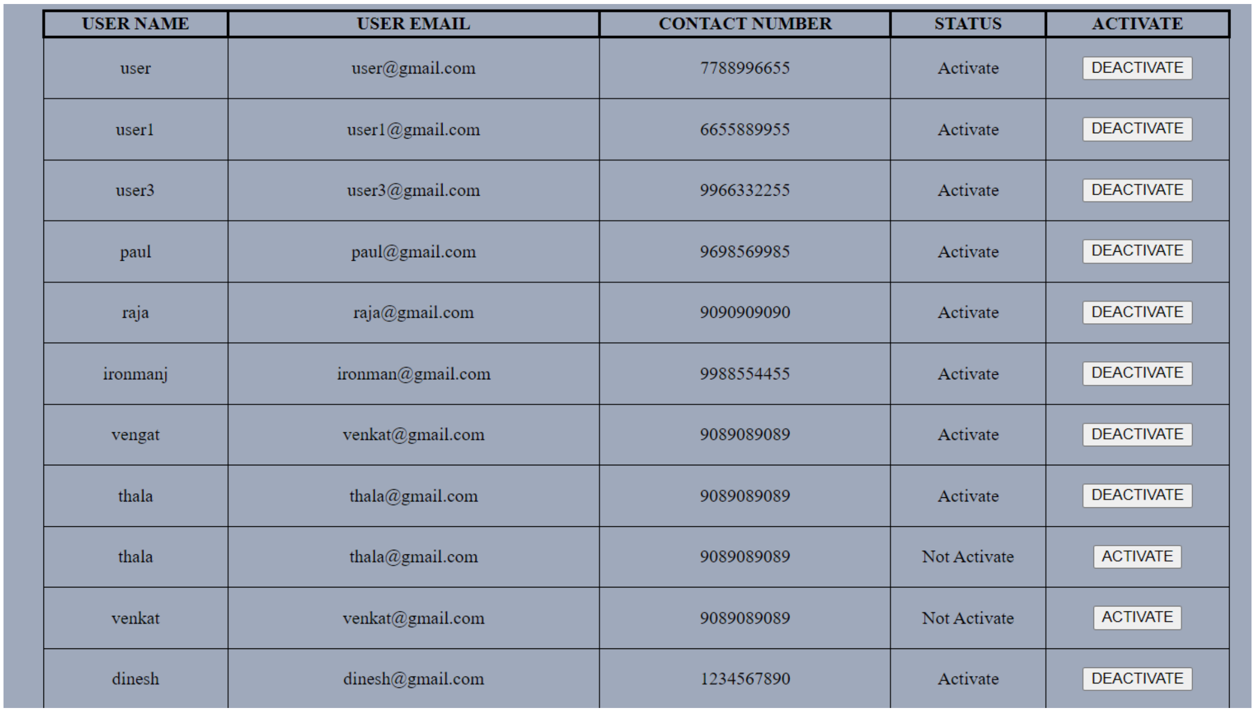
MM / YY

CCV

123

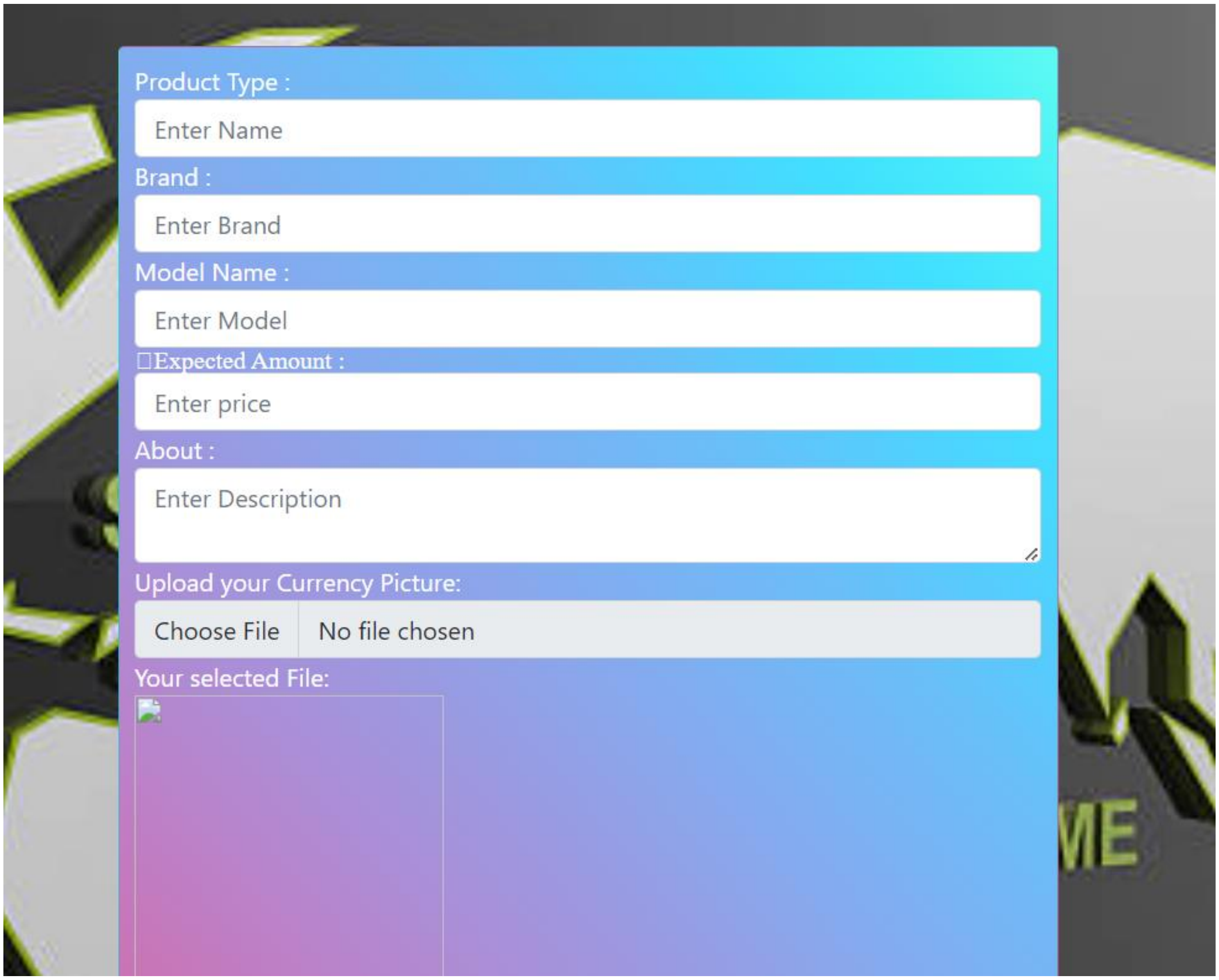
PLACE YOUR ORDER

Figure B-7: Payment Page



USER NAME	USER EMAIL	CONTACT NUMBER	STATUS	ACTIVATE
user	user@gmail.com	7788996655	Activate	DEACTIVATE
user1	user1@gmail.com	6655889955	Activate	DEACTIVATE
user3	user3@gmail.com	9966332255	Activate	DEACTIVATE
paul	paul@gmail.com	9698569985	Activate	DEACTIVATE
raja	raja@gmail.com	9090909090	Activate	DEACTIVATE
ironmanj	ironman@gmail.com	9988554455	Activate	DEACTIVATE
vengat	venkat@gmail.com	9089089089	Activate	DEACTIVATE
thala	thala@gmail.com	9089089089	Activate	DEACTIVATE
thala	thala@gmail.com	9089089089	Not Activate	ACTIVATE
venkat	venkat@gmail.com	9089089089	Not Activate	ACTIVATE
dinesh	dinesh@gmail.com	1234567890	Activate	DEACTIVATE

Fig B-8: User Approval Page



Product Type :

Enter Name

Brand :

Enter Brand

Model Name :

Enter Model

□Expected Amount :

Enter price

About :

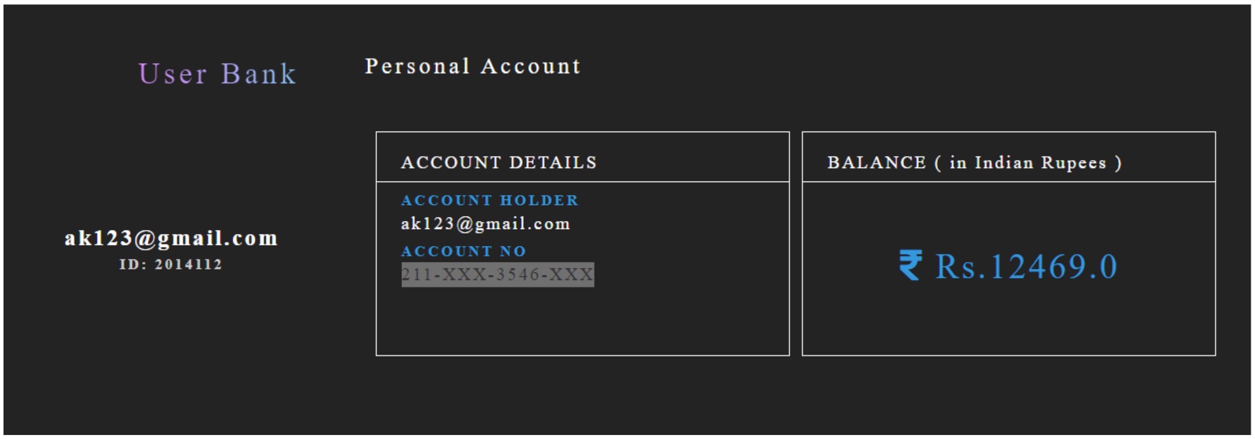
Enter Description

Upload your Currency Picture:

Choose File No file chosen

Your selected File:

Figure B-9: Product Details



User Bank

Personal Account

ak123@gmail.com

ID: 2014112

ACCOUNT DETAILS

ACCOUNT HOLDER

ak123@gmail.com

ACCOUNT NO

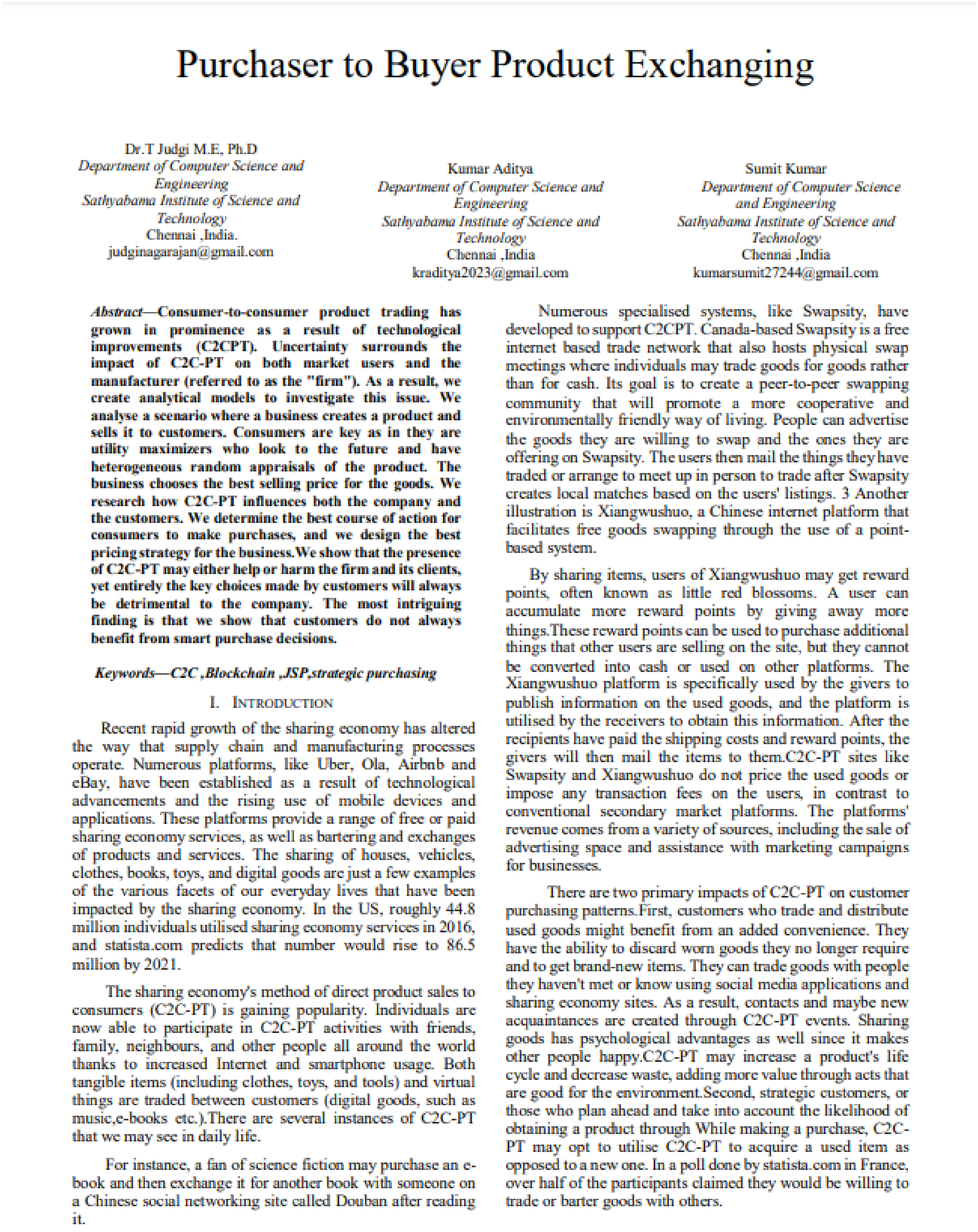
211-XXX-3546-XXX

BALANCE (in Indian Rupees)

₹ Rs.12469.0

Figure B-10: User Account Balance

C. RESEARCH PAPER



Purchaser to Buyer Product Exchanging

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***Abstract*—Consumer-to-consumer product trading has grown in prominence as a result of technological improvements (C2CPT). Uncertainty surrounds the impact of C2C-PT on both market users and the manufacturer (referred to as the "firm"). As a result, we create analytical models to investigate this issue. We analyse a scenario where a business creates a product and sells it to customers. Consumers are key as in they are utility maximizers who look to the future and have heterogeneous random appraisals of the product. The business chooses the best selling price for the goods. We research how C2C-PT influences both the company and the customers. We determine the best course of action for consumers to make purchases, and we design the best pricing strategy for the business.We show that the presence of C2C-PT may either help or harm the firm and its clients, yet entirely the key choices made by customers will always be detrimental to the company. The most intriguing finding is that we show that customers do not always benefit from smart purchase decisions.**

Keywords—C2C ,Blockchain ,JSP,strategic purchasing

I. Introduction

Recent rapid growth of the sharing economy has altered the way that supply chain and manufacturing processes operate. Numerous platforms, like Uber, Ola, Airbnb and eBay, have been established as a result of technological advancements and the rising use of mobile devices and applications. These platforms provide a range of free or paid sharing economy services, as well as bartering and exchanges of products and services. The sharing of houses, vehicles, clothes, books, toys, and digital goods are just a few examples of the various facets of our everyday lives that have been impacted by the sharing economy. In the US, roughly 44.8 million individuals utilised sharing economy services in 2016, and statista.com predicts that number would rise to 86.5 million by 2021.

The sharing economy's method of direct product sales to consumers (C2C-PT) is gaining popularity. Individuals are now able to participate in C2C-PT activities with friends, family, neighbours, and other people all around the world thanks to increased Internet and smartphone usage. Both tangible items (including clothes, toys, and tools) and virtual things are traded between customers (digital goods, such as music,e-books etc.).There are several instances of C2C-PT that we may see in daily life.

For instance, a fan of science fiction may purchase an e-book and then exchange it for another book with someone on a Chinese social networking site called Douban after reading it.

Numerous specialised systems, like Swapsity, have developed to support C2CPT. Canada-based Swapsity is a free internet based trade network that also hosts physical swap meetings where individuals may trade goods for goods rather than for cash. Its goal is to create a peer-to-peer swapping community that will promote a more cooperative and environmentally friendly way of living. People can advertise the goods they are willing to swap and the ones they are offering on Swapsity. The users then mail the things they have traded or arrange to meet up in person to trade after Swapsity creates local matches based on the users' listings. 3 Another illustration is Xiangwushuo, a Chinese internet platform that facilitates free goods swapping through the use of a point-based system.

By sharing items, users of Xiangwushuo may get reward points, often known as little red blossoms. A user can accumulate more reward points by giving away more things.These reward points can be used to purchase additional things that other users are selling on the site, but they cannot be converted into cash or used on other platforms. The Xiangwushuo platform is specifically used by the givers to publish information on the used goods, and the platform is utilised by the receivers to obtain this information. After the recipients have paid the shipping costs and reward points, the givers will then mail the items to them.C2C-PT sites like Swapsity and Xiangwushuo do not price the used goods or impose any transaction fees on the users, in contrast to conventional secondary market platforms. The platforms' revenue comes from a variety of sources, including the sale of advertising space and assistance with marketing campaigns for businesses.

There are two primary impacts of C2C-PT on customer purchasing patterns.First, customers who trade and distribute used goods might benefit from an added convenience. They have the ability to discard worn goods they no longer require and to get brand-new items. They can trade goods with people they haven't met or know using social media applications and sharing economy sites. As a result, contacts and maybe new acquaintances are created through C2C-PT events. Sharing goods has psychological advantages as well since it makes other people happy.C2C-PT may increase a product's life cycle and decrease waste, adding more value through acts that are good for the environment.Second, strategic customers, or those who plan ahead and take into account the likelihood of obtaining a product through While making a purchase, C2C-PT may opt to utilise C2C-PT to acquire a used item as opposed to a new one. In a poll done by statista.com in France, over half of the participants claimed they would be willing to trade or barter goods with others.

Research has been heavily focused on the sharing economy's recent expansion in company operations. Despite noticing several real-world instances in our everyday lives.

This is the first analytical research that examines C2C-PT with strategic customers that we are aware of. Our findings are theoretically supported and analytically produced. The research presented in this article can assist managers understand how C2C-PT and strategic customer behaviour interact to enhance their operational success. We specifically pinpoint the possible circumstances in which the existence of C2C-PT might help or harm the company and customers.Our understanding of C2C-PT will be significantly affected by this groundbreaking discovery. We find that, contrary to popular belief, strategic purchase practises may harm consumers themselves rather than only helping the decision-maker. This discovery is significant because it raises the possibility that customers may be better off acting in a non-strategic rather than strategic manner. Hence, by tending to the subject of C2C-PT with key clients, this study adds to the writing as well as to certifiable practice, since supervisors and strategy producers might utilize our outcomes to pursue better essential choices while managing a C2C-PT issue.

II. Literature Review

In the study conducted by [1]Karl Wust; He compares the characteristics of several blockchain kinds (permissioned and permissionless) to those of a centrally controlled database. provided a way to determine what kind of blockchain would be acceptable if a blockchain is found to be beneficial given the needs of the challenge. In an other study [2]Arthur Gervais; Sonkor Kanti Nath; A technique that is created takes into account the necessary application requirements, parties involved, and technological aspects like throughput and latency. We came to the conclusion that there are, in fact, legitimate use cases for both permissionless and permissioned blockchains, as well as centralised databases, depending on the application scenario.[3]Juan Vanerio; Federico Larroca; in 2019 which developed Online based Prediction for Cognitive Radio Secondary Markets. Devices that use Cognitive Radio and alter their operational settings can be made technically viable. Before recommending an on-demand secondary market model with a spectrum broker in charge of resource allocation, we analyse alternative technological and economic approaches for successful spectrum sharing.

[4] Arnob Ghosh; Saswati Sarkar; When a channel becomes available for purchase at random, the main must choose a cost and a rundown of non-meddling areas. The contention diagram portrayal of the area uncovers the arrangement of non-meddling spots to be a free set.
[5] Tian and Jiang Create an scientific model to research what C2C item sharing means for dissemination courses. They accept that a marketable strategies its creation limit ahead of time, a retailer offers the merchandise to shoppers who are thinking forward, and the clients who purchased the item might lease it out to others for extra money.According to their research, C2C product sharing may either benefit the retailer and the company or hurt both of them, depending on the capacity cost efficiency of the business. [6]Benjaafar et al; Dive into the p2p product-trading issue, whereby customers who possess a product may rent it to those who don't own it. They find that the presence of distributed item sharing advantages clients for each situation.
[7]Lin et al; To research the impacts of such lead on the production network and its members, offer a two-period model. They discover that the actions always benefit the manufacturer and have the potential to help or harm the retailer and supply chain. The majority of these research concentrate on consumers who foresee the future price will drop and wait for it strategically. [8]Hendel and Lizzeri; It examine the adverse selection issue in marketplaces for durable goods, put forth a dynamic model. They demonstrate that the secondary market's equilibrium trade volume is consistently positive. [9]Lee and Whang; investigate a secondary market where shops can acquire and sell excess inventories in the second period, suggest a two-period model. They discover that a market like this has the power to boost or hamper a manufacturer's sales. [10] Yin et al; thoroughly examine the retail and peer-to-peer used goods marketplaces, two categories of secondary markets. They discover that these two market types can have an impact on the vendor's plans for product upgrades and the retailer's price choices.

III. Problem Statement

Trading of goods from consumer to consumer will have potential threats. It might result in some major problems, the collapse of the trading service, or the disclosure of customer data. Market Cleaning Mechanism - The market mechanism is a way for buyers and sellers to conduct transactions in a market with a transparent and well-understood system of value and time. It is a method to examine the total market. Its poor environmental integrity, high transaction costs, and convoluted governance have all drawn criticism.

IV. Proposed System and Architecture

Based on user lists, the blockchain security system will assist in finding nearby matches, after which users may ship goods to be swapped or arrange to meet up in person. Using a hash function, you may change variable-length texts into fixed-length strings called hash values or digests. Passwords can be hashed into arrays of permitted characters, for instance. The original feed cannot be created by inverting the expected output.

When a transaction is generated, it synchronises the information. Data integrity is protected using hash functions.

It is feasible to compute the data's hash and contrast the two results.

A. Algorithm Used

Secure Hash Algorithm 256-bit, or SHA256, is a cryptographic security algorithm. Hashes generated by cryptographic hash algorithms are both irreversible and unique. This makes it nearly hard to predict the data that is concealed within the hash. Since hashes cannot be undone, the method is frequently employed for computer security.

Secure Hash Algorithm, better known by its abbreviation SHA, is used to hash data and certificate files. Each item of data generates a unique hash that is completely indistinguishable from any other piece of data. Due to the reliance on the hash that is produced from the data, the resultant digital signature is also singular. It is difficult to use a competent hash algorithm to reverse the hash value and determine the original text. Passwords, however, are quite concise. The attacker can check the result of his SHA-256 against the SHA-256 he discovers in the database by guessing a password.

B. Modules

Five steps are outlined in this article for trading the C2CPT product. Logging in is the first step, followed by uploading products, viewing them, paying for them, and checking the status of those payments.

a) Login:- This is the initial module in our project, and it represents a single task carried out within a database management system against a database, handled in a reliable and logical manner apart from other transactions. Any modification to a database is often represented as a transaction. The user will send the payment to the supplier.

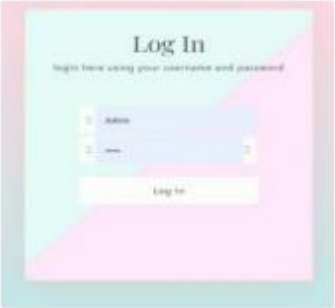

Figure 1: Login Page

b) Consumer Product Upload:- This module is used to assist the user in uploading the product together with the land longitude. The user will also update the report with their feedback, and the database will be kept.

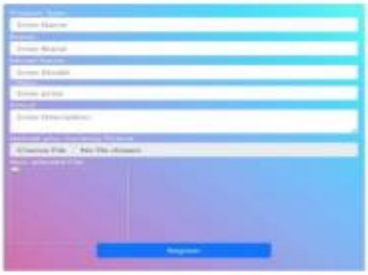

Figure 2: User Product Uploading

c) Product View:- The consumer will view the product in this module. Additionally, request that another customer inspect your goods and provide feedback.

d) Payment:- The Consumer will spend for another Consumer's product item in this module. The consumer is in charge of the payment information saved in the database.

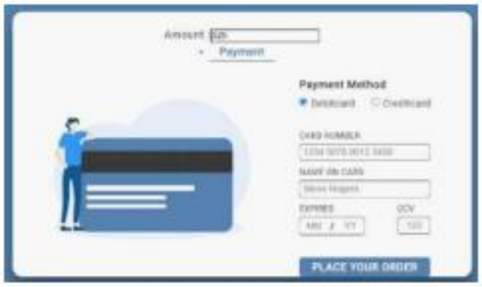

Figure 3: Payment Page

e) Payment View:- This module is designed to assist the customer in seeing the payment status report to determine whether or not they have been paid. They may also amend the report with their feedback, and it will be kept in a database.

C. System Architecture

The system's architect sets the fundamental framework, and to ensure privacy, we may place a limited amount of data on a local computer and a fog server. We also suggest the Hashcode Solomon method. Additionally, this technique can calculate the distribution proportion saved in the cloud, the fog, and the local computer, respectively, based on computational intelligence. Our plan's practicality has been confirmed by theoretical safety analysis and experimental assessment, making it a very potent addition to the current cloud storage system.

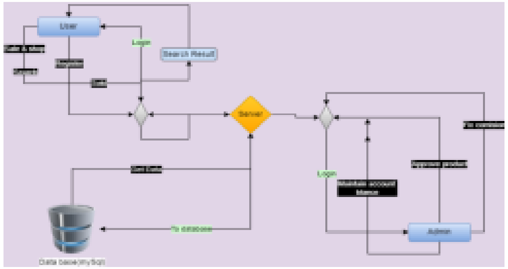

Figure 4: Architecture of the proposed system

D. Methodology

By offering three unmistakable sorts of elements, for example, pre-picture obstruction — otherwise called the primary degree of picture opposition, second degree of pre-picture opposition, and crash opposition — cryptographic hash capabilities are utilized to hold and save the secured kind of data.The pre-image crypt resistance technique's indisputable strength is that it makes it difficult and time-consuming for hackers or other attackers to find by delivering the hash value for the initial intended message.

As a result, the SHA algorithm's one-way nature with a function, which is primarily what makes it secure, provides the security. Pre-image resistance is essential to fending off brute force assaults from a horde of massive and strong devices.

Similar to the first resistance method, the second resistance method requires the attacker to have a difficult time decoding the subsequent error message even after the message's primary level has been cracked.The collision resistance is the last and most challenging to break since it makes it very difficult for the attacker to find two separate messages that hash to the same value.

V. Conclusion

Today, a wide variety of internet trading platforms are available. University students who merely want a straightforward, intelligent, and user-friendly platform for trading on campus, do not enjoy them since they have a lot of problems (or within a small community). Consumers may communicate with each other directly, which is the quickest and easiest approach to work together as a community to address problems for customers. Understanding customer concerns and making sure they don't happen again may help businesses identify future patterns and even move toward a complaint-free environment.

Consumer-to-Consumer refers to the exchange of goods and services, the transfer of money or data across a network, typically the internet..It is possible to conduct transactions from business to business (B2B), business to consumer (B2C), consumer to consumer, and consumer to business. The recommender system would then provide sales product recommendations to the potential customer. Overall, a platform designed for direct trade between consumers would be more intelligent, user-friendly, and straightforward.

We only explore one kind of platform in this article. Even though it would be technically complex, expanding our approach by adding various online media will be intriguing. Studying a rather more generalized C2C platform with money transactions will also be intriguing. Future study should also focus on the implications of C2C-PT in a distribution network scenario and how to include performance concerns into the C2C-PT model.

Acknowledgement

I'd want to express my deepest thanks to Sathyabama University's Professor Dr. T Judgi for her passionate encouragement and assistance during my research.

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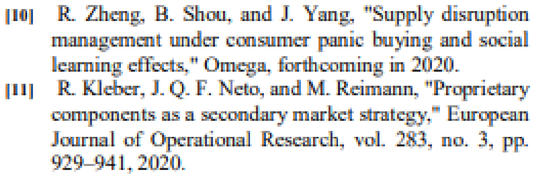

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