ENHANCING E-COMMERCE TRANSACTIONS WITH A SECURE AND EFFICIENT PAYMENT SYSTEM

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ABSTRACT

E-commerce is the process of buying and selling goods and services online using web browsers. As it continues to grow rapidly, it has changed how people handle both money-related and other types of transactions. In online payments, known as e-commerce payments, the payment gateway is very important for making sure transactions are safe and smooth. Usually, these gateways send payment details through trusted third parties. However, cloud servers used in these systems are not always fully secure.This paper presents a new, secure, and efficient electronic payment system for e-commerce. It allows customers to connect with sellers directly in a safe way. One key feature of the system is that it lets users protect their personal information by using a temporary identity during transactions. This helps keep their real identity private. The proposed system improves security in several ways, including better privacy, data protection, user authentication, and system reliability.

Index Terms:-E-commerce, Identity Protection, Data Integrity, Non-repudiation, Cloud Security.

1.INTRODUCTION

E-commerce was first introduced to consumers and businesses as a novel concept in 1990 [1]. Since then, it has expanded and evolved significantly, offering tremendous benefits to global consumers and businesses. The history of e-commerce is closely intertwined with the development of the Internet. When the Internet became publicly accessible in 1991, it enabled the possibility of online shopping [1,2]. E-commerce is defined as a primary business model involving the sale of goods, procurement of resources, and the distribution or exchange of products, services, and information over the Internet [3].E-commerce can also integrate with mobile payment systems, allowing customers to make purchases using smartphones. Mobile commerce, a key extension of e-commerce, enables customers to conduct online transactions using wireless handheld devices such as tablets, smartphones, and laptops [6]. The growing popularity of e-commerce is attributed to the convenience it offers, allowing customers to shop from the comfort of their homes, with affordable solutions and hassle-free delivery.

The widespread appeal of e-commerce stems from its ability to facilitate online transactions, provide various services and information, and enable immediate financial exchanges between businesses [7].Many entrepreneurs are eager to establish their own online presence, recognizing the global reach that an e-commerce website can offer. Likewise, customers are increasingly drawn to online shopping to save time and avoid the inconvenience of traditional shopping. E-commerce is essentially an electronic process for buying and selling goods and services online through standard web browsers. It encompasses the sale and purchase of goods and services using wireless technology.While developed nations are more familiar with these systems, online shopping is rapidly gaining traction in developing countries. The primary objectives of an electronic payment system are to enhance efficiency, improve security, and increase customer convenience and usability.

Within the electronic payment system, the payment gateway plays a crucial role in ensuring that transactions occur smoothly and securely [8,9]. This system secures purchases and protects transaction information. A payment gateway safeguards transaction details by encrypting sensitive information, such as credit/debit card data, ensuring secure transmission between the

consumer and the transaction processor. Every online transaction must pass through a managed transaction gateway. The secure electronic payment framework consists of four key system components [10]. These components interact through secure communication channels, providing a protected means of communication between parties, such as the buyer and the merchant, via the transaction gateway. For the e-payment system to be reliable, it must ensure security for all participants in online transactions, including the payment gateway server, bank account server, and merchant server.This paper is divided into six sections. Section 1 introduces electronic payments and their related study. Section 3 includes an overview of the existing system and the formulation of the problem. Section 4 addresses how the model will be implemented. Section 5 discusses the modules. Finally, the last section presents the conclusions and future work.

2.LITERATURE SURVEY

- The study by Alam, S.S., Ali, M.H., and Omar, N.A. investigates the factors affecting customer satisfaction in online shopping by developing a conceptual model based on prior research. The study tested ten hypotheses using data collected from 337 respondents via Google Forms. The regression analysis reveals that factors such as customer service, information quality, response time, transaction capability, delivery, merchandise attributes, security/privacy, convenient payment method, and price significantly influence customer satisfaction. The findings provide valuable insights for online retailers in Malaysia to make informed investment decisions aimed at enhancing customer satisfaction.

- Noor Ardiansah, Chariri, Rahardja, and Udin investigate aspects of e-payment security in relation to e-commerce consumers' purchase intentions. The study focuses on college students in Semarang, Indonesia, representing the millennial generation. Structural Equation Modeling (SEM) using Warp-PLS is employed to analyze the data. The findings reveal a well-fitting model to explain e-commerce customers' purchase intentions. The results indicate that perceived usefulness has a stronger mediating effect on the relationship between e-payment security and customers' purchase intentions.

Additionally, perceived ease of use significantly influences e-commerce customers' purchase intentions indirectly through e-payment security. The study highlights that the ease and usability of security aspects in electronic payments impact e-commerce consumers' purchase intentions, emphasizing the importance of security awareness in electronic transactions.

- Soare.C.A describes a method of implementing two-factor authentication using smart phones as software tokens. The proposed system will use the mobile phone as a software token and generate unique one time passwords (OTP) that will be used when authenticating to an Internet Banking application. The tokens can also serve as a method of signing online money orders. We will prove in this article the cost efficiency of the proposed architecture for both consumers and companies.

- Satar.N.S.M, Dastane.O, and Maarif.M.Y,propose that E-commerce tools have become essential and are important not only for customers but also for industry players. The intention to use E-commerce tools among practitioners, particularly in the Malaysian retail sector, is not yet comprehensive, as many businesses continue to prefer costly traditional marketing methods. The research applies academic models and frameworks to real-life situations to develop a value proposition in the practical world. It examines 11Street as the company under study and compares it with Lazada, a leading competitor in the market. The objectives include identifying customers' perceptions of value for E-commerce businesses, critically evaluating the existing value proposition of 11Street in comparison with Lazada to identify gaps, and proposing a new value proposition for 11Street. This paper first identifies the customer-perceived value of E-commerce, then critically reviews the existing value proposition of 11Street, and contrasts it with the leading player Lazada. By the end of the research, a new consumer value proposition for 11Street is proposed to align with Malaysian consumers' value criteria.

- Narwal.B proposed that M-Commerce is a global phenomenon, gaining strong

momentum as most purchases are now made through mobile devices. The frequency of these transactions indicates that people are becoming accustomed to M-Commerce, which has become an integral part of their lives. Given that security and privacy are major concerns for users, it is crucial to use a reliable, secure, and authenticated mobile payment protocol. In this paper, various open network protocols (e.g., ECash, NetCash) and mobile payment protocols (e.g., SET, iKP, MSET, MPCP2, SLMPP, and LPMP) are studied. These protocols were modeled in HLPSL language according to the documentation specified by the AVISPA tool, and then validated and analyzed. The results were compared based on susceptibility to security attacks and the cryptographic operations required. The research concludes that the LPMP protocol is the fastest in terms of search time and is immune to various security attacks.

3.EXISTING SYSTEM:

A secure and privacy-preserving electronic payment approach can be found in where the authors suggested electronic tokens as being an abstraction of basic fiat currency of equivalent benefit in order to provide privacy and protection in digital payments, presenting an intermediate entity in the method that mediates a transaction between the payer and the pay.

3.1. DRAWBACKS:

- ❖ Missing privacy
- ❖ Disclosing users data

4.PROPOSED SYSTEM:

A secure protocol in e-commerce to enhance the security of the e-commerce process, which can also improve the security of existing work. Interestingly, the proposed system does not require the customer to input his/her identity in the merchant website even though the customer can hide his/her identity and make a temporary identity to process a request for the service. The proposed system is made up of five entities: client (C), merchant (M), payment gateway (PG), user bank.

4.1 ADVANTAGES:

- Improve the security
- Improving the efficiency

5.SYSTEM ARCHITECTURE

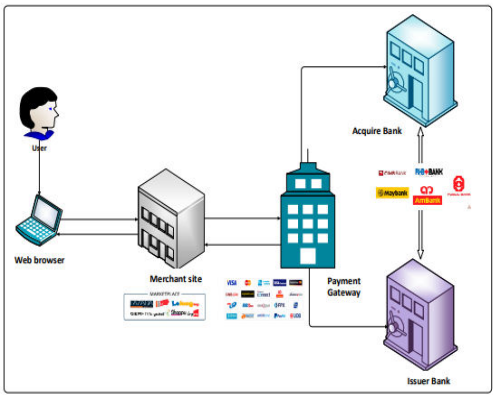


Figure.1 System Architecture

6.MODULE DESIGN:

The major modules of the project are

1.USER

Here user is a modules, he should register with the application and after his successful registration he must authorized by the admin and user can login with valid username and password. After successful login he can perform some operations such as create a bank account, deposit amount in his account, search product, purchase product and view all purchased products and logout.

2.MERCHANT

Here merchant is a module, he should register by selecting available e-commerce site and login with username and password, after successful login he can perform some operations such as create bank account, deposit amount in his account, upload product, and view products which he uploaded and logout.

3.BANK

Here bank is a module, he should register by selecting available bank and login with username and password, after successful login he can perform some operations such as view all customers details and generate their account numbers and view all request to transfer amount from one bank to other bank and logout.

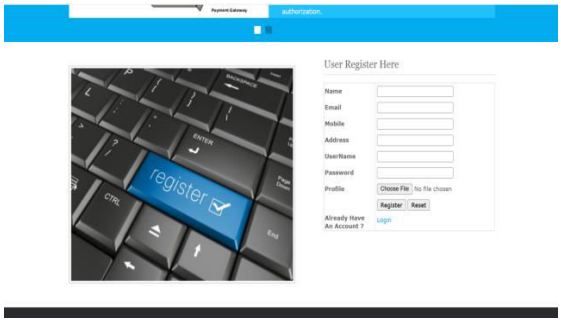
4.ADMIN

Here admin is a main module , here admin can directly with the application and then he can view all users and authorize them, add merchants and view all registered merchant details, add banks and view all registered banks details and logout

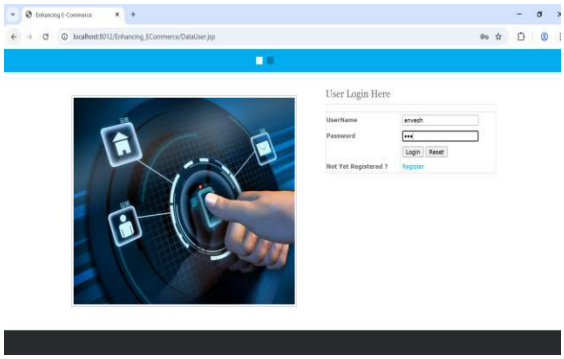
7.SCREENSHOTS

Home Page

User Register



User Login



User Home Page

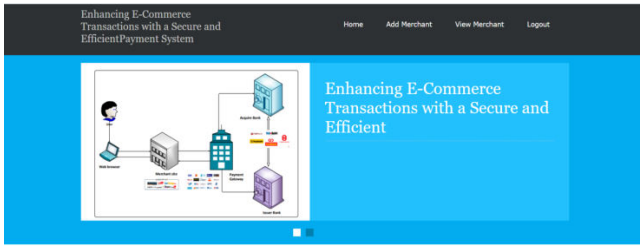
Payment Gateway

Admin

Admin Page

Welcome To Admin Home

Add Merchant

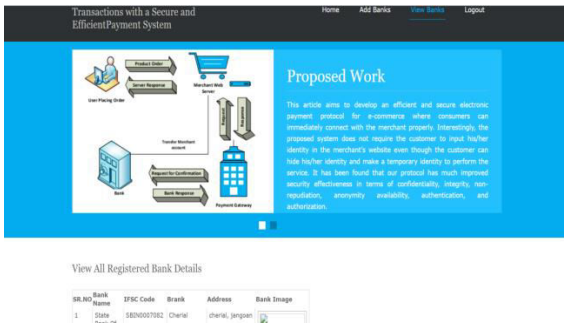


Welcome to Merchant Page

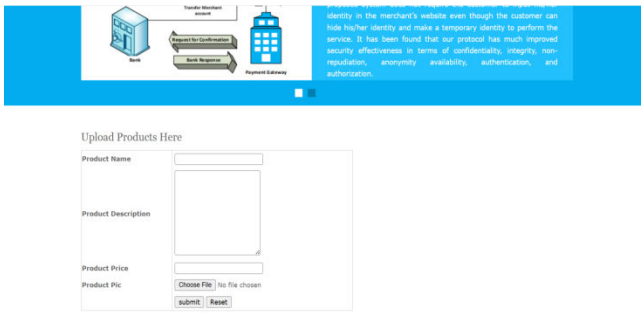
Add Banks

Welcome to Bank Page

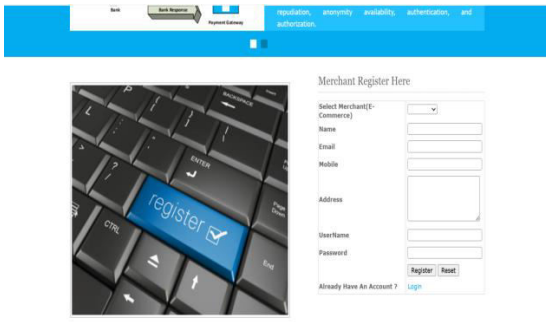
View Banks



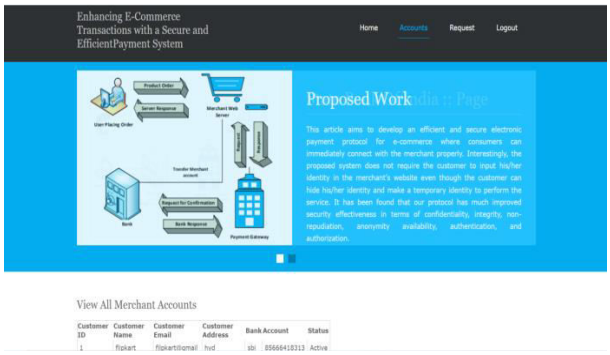
Upload Products



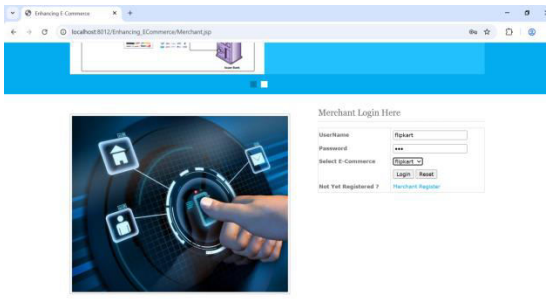
Merchant Register Here



Bank Home Page

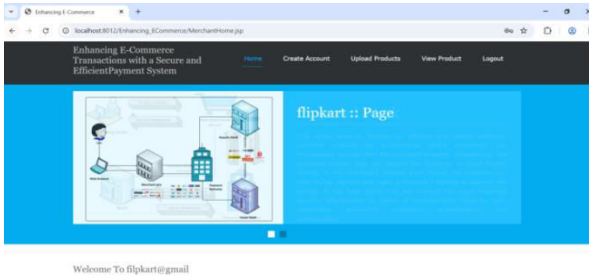


Merchant Login Here



Request Page

Merchant Home Page



8.CONCLUSION

Over the past few decades, e-commerce has seen a significant surge in popularity, transforming traditional payment methods into online transactions. As e-commerce continues to grow, the market for digital

payments has expanded rapidly, with mobile payments becoming increasingly popular and playing a vital role in this evolution. The primary concern now is the need for a more secure payment system and robust online authentication for both clients and web servers, which are crucial for the growth and development of e-commerce.In this research, we propose an efficient and secure electronic payment system tailored for e-commerce. We conducted a comparative analysis between our proposed framework and three existing systems that utilize RSA and DES encryption to secure debit/credit card information while maintaining user anonymity. Many clients seek an e-commerce platform that offers numerous benefits, particularly one that is secure and meets all necessary specifications.Based on these requirements, we have developed a secure electronic payment system specifically for e-commerce environments. In our proposed approach, the transaction gateway acts as a proxy, facilitating communication between the client/merchant and the bank. Our security analysis shows that the proposed system offers superior protection in terms of confidentiality, non-repudiation, integrity, availability, and anonymity.

9.FUTURE ENHANCEMENT

Future work will focus on implementing our framework in real-world applications, demonstrating its ability to prevent various attacks and evaluating the time required for electronic payments.

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