Journal of Positive School Psychology http://journalppw.com
2022, Vol.6, No.4, 2332-2339

# A Comprehensive Study of Barriers in Electronic Transactions for Customers and Banks

**Manoj kumar Shamrao Barbhai[1]; Dr. Yogesh kumar sharma[2]; Dr.Shraddha Bhushan Sable[3]**

[1]Research Scholar Department of Computer science & Engineering; Shri JJT University Jhunjhunu Rajasthan

[2]Dean, School of Engineering & Technology

[3]Assistance Professor, Tilak Education Societ, S.K. college of Science and Commerce, Nerul, Navi Mumbai, Maharashtra

*Abstract*

In today's digital world, electronic payment mechanisms are essential. Security and privacy are major issues in this field. Electronic money is, in fact, nothing more than a type of readily cloned digital information. Furthermore, all of a user's online activities are automatically recorded in an electronic log. Secure and anonymous electronic payment methods are examined and created in this thesis. The first section of the article provides an overview of the most popular online payment methods. Direct usage of credit card information is the most often used payment method. As a result, it has serious security concerns. However, there are payment methods that are logically safer, but they aren't employed for a variety of reasons. Secure mobile payment solutions are being created as a result of the massive development in mobile communications. This study encourages the use of the WWW and mobile devices together and provides many use cases. The WWW is getting a brand-new GSM-based payment mechanism. Additionally, a software token that is immune to particular assaults has been proposed.In the future, mobile software agents will be able to assist users with a variety of tasks that would otherwise take a long time. Agents' communications are protected in this thesis. Finally, this study analyses how mobile agents can execute secure electronic transactions from untrusted hosts via the Internet.

***Keywords:*** Barriers, Electronic Transactions, Customers, Banks,

## 1. Introduction

Electronic commerce emerged in the early 1990s as a new method of conducting commercial transactions for businesses and consumers alike (e-commerce). Throughout the years, e-commerce has become a widely accepted method of doing business. It is impossible to ignore the phenomena of e-commerce, regardless of whether you've ever thought about running a business online or offline. E-commerce is clearly here to stay, as seen by the large number of companies and individuals working in the area, and businesses and consumers alike are making every effort to reap the benefits it offers.

Both B2C (business-to-consumer) and B2B (business-to-business) e-commerce have grown significantly in importance in recent years. Customers may now have a greater say in the creation of the items they buy, the customization they get, and the services they receive, thanks to B2C e-commerce. Shoppers may easily access products, services, information, electronic banking, and personal financial management through e-commerce channels. It is making it simpler for customers to identify the items and services they are looking for, match them more exactly to their needs, and compare pricing, as well (Vulkan, 2003). Numerous businesses have been created to meet the demands of different clients, including web portals, content suppliers and transaction brokers.

Businesses may more easily adapt to market and consumer demand changes by using e-commerce in their business-to-business relationships, which streamlines the use of suppliers and product distribution. Companies may work more closely with manufacturers when they have direct e-commerce partnerships like this, which allows for greater customizability and command

over business operations. The elimination of'middlemen' from the supply chain reduces expenses dramatically. Dell and Cisco are good examples of corporations that use this business strategy (Guttmann, 2003; Laudon &Traver, 2002).

When it comes to B2B connections, ecommerce can result in reduced prices for customers since it reduces inventory and operational and distribution costs. By ensuring that suppliers have the components they need on hand at the right time, e-commerce can help businesses increase production flexibility, improve product quality, increase opportunities for collaboration with suppliers and distributors, and create greater price transparency—the ability for buyers and sellers to see the actual market prices (Laudon &Traver, 2002). Customers' desires for cheaper pricing and ease of use are being met by e-commerce in this way.

## 2. E-commerce and electronic payment systems

The most widely accepted definition of e-commerce is predicated on the idea that all of a company's transactions take place online. It is possible to purchase and sell anything over the Internet or in other online settings using e-commerce. The problem of secure and dependable money transfer between the parties involved in a transaction is critical in any kind of commerce. Electronic payments are what we term money exchanges in an e-commerce setting since they take place electronically. E-commerce relies heavily on electronic payments, which are an essential feature of the business model. Electronic payment is a type of financial exchange enabled by electronic communications that occurs between the buyer and seller in general.

This type of payment is made by an electronic means in a web-based e-commerce environment (Kalakota&Whinston, 1997).

After a consumer decides to pay for a product or service, electronic payment systems (EPSs) are summoned to support the most critical activity – delivering payments from customers to vendors in the most effective, efficient, and problem-free manner. To ensure the future of e-commerce, electronic payment systems (EPSs) must be developed in a timely manner.

As new sorts of online purchasing interactions and business models have emerged, there has been a demand for new money exchange methods and electronic payment systems, or EPSs. Since internet auctions (Ribbers& Heck, 2004) have made it necessary for individuals to transfer money amongst themselves, the need for person-to-person payment systems has grown. Small and micropayments are required for several sorts of information products and services.

Businesses want to make money by selling low-cost information that is constantly being resold. E-commerce. For example, EPSs can be used to sell copyrighted internet material, like as music, for a fee. For the first time, e-commerce transactions may be carried out utilising wireless mobile devices such as mobile phones or personal digital assistants (PDA).

Payment solutions for mobile electronic commerce have been developed in response to the growing demand for mobile payments (Laudon &Traver, 2002). Aside from these advantages, e-commerce offers the opportunity to improve or replace existing payment methods. Once online payments became necessary, the offline world's existing payment systems were first used to make online payments. Although credit cards were initially designed to be used offline, they have now become the primary method of payment for e-commerce transactions. The shortcomings of credit and debit cards and checks are becoming increasingly obvious as e-commerce and online purchase expands.

## 3. Problem definition

A machine learning model is discovered and built in this thesis that is used to solve the problem of identifying an online store visitor as either aborting or non-aborting, in the following referred to as no-buying and purchasing sessions.

For example, the models may be applied to the clickstream information generated by each visitor to the web shop, as well as if the visitor can be recognised, to customer data. An online shopping session's likelihood of purchase is predicted using a variety of models and data. This is done to determine which model and data are best-suited for the purpose of forecasting the buying probability of an online shopping

session. Use cases require real-time prediction and model comprehensibility since the demand for explaining machine learning models' judgments is increasing. Latency is significant. For the sake of evaluating the various algorithms, we will utilise the German clothes retailer's boosted tree model as a starting point.

An exploratory data analysis of the clickstream and static customer data is carried out in order to gain a deeper understanding of the differing performance on different datasets.

Using datasets that needed less feature engineering, an RNN representing the class of stateful machine learning models is trained to see if stateful models deliver good results while requiring less feature engineering.

Once all datasets have been analysed, the models are evaluated for their ability to withstand a variety of circumstances. Visitor characteristics like gender and device type are two examples of this type of information. Using this data, we can predict how well the models will perform in the actual world. If a tested model outperforms the baseline model, then deployment is just an inference of this study.

The research question as described below is the consequence of all of the preceding factors:

*How can a customer at an online store be classified as a buyer or a non-buyer?*

The following are the five supporting questions that must be addressed in order to fully address the central research topic:

- Sub Question 1: Describe how an exploratory data analysis can aid in the solution of the prediction issue.
- Sub Question 2: In order to tackle the prediction problem, what type of machine learning model is best?
- Sub Question 3: Does the performance of the models alter depending on whether the data is dynamic clickstream or static customer data?
- Sub Question 4: Is it possible for stateful models to deliver decent outcomes while requiring fewer features to be developed?
- Sub Question 5: Does the best-suited algorithm hold up well in a variety of circumstances?

## 4. Necessity for Consumer Protection in E-commerce

In general, the Internet's popularity as a source of goods and services is rising on a daily basis. Because of this, it is ill-advised to pursue the growth of e-commerce without establishing a legal framework for consumer interactions. As the contract's weakest party, customers may be made even more vulnerable in an electronic setting without the presence of the other parties. As a result, consumer protection has become a major issue in many nations, both industrial and developed. As an example, at the European level, there are an incredible number of legislative frameworks that handle consumer problems both online and offline. Many nations still rely on the broad principles of Civil Law to handle consumer concerns; these are plainly, as it will be proven throughout this study effort, incapable of providing a sufficient degree of protection for consumers.

As e-commerce continues to grow, the legal framework that protects consumers is essential. The goal of legal infrastructure is to regulate and oversee e-commerce concerns (e.g. the formation of a contract, jurisdiction, electronic payment, electronic signature, contract conclusion etc). Laws must be able to operate successfully when they are supported by the "legal infrastructure" that Connolly says is "well-recognized in international law." To put it another way, e-legal commerce's infrastructure may be characterised as a variety of legal frameworks relevant to e-commerce, such as e-contract law, e-crime legislation, consumer protection and personal data security.

There is a distinct difference between the present law of contract and commercial contracts when it comes to protecting consumers. When looking into the flaws of basic rules governing commercial contracts in regard to consumer protection, this will be useful, which in turn raises the need for current law to strengthen consumer protection.

The phrase "commercial contracts" in this study does not extend beyond a historical viewpoint, however, before making such a difference. However, legal classifications between civil and commercial contracts and their effects will not be examined here, as this research is not a legal

one. As a result, it's vital to define the phrase "commercial contracts" in this context.

Classical or traditional contract law, as opposed to current contract law, is represented by the term "commercial contracts." Legislative approaches to regulating contracts were founded exclusively on the idea of freedom of contract in the early 19th century before the notion of consumer contracts was introduced. As a result, the classical law of contract allows parties to freely agree on whatever they desire, as long as it doesn't conflict with the main principles of the law. General principles of contract under classical law aim to ensure the lawfulness of the contract through the verification of elements necessary to form an effective contract (e.g. the offering and accepting, consideration, intention to enter into legal relations, capacity, as well as legality) and the existence of agreement in the terms of the contract with respect to real consent and defect-free contracts through consensus ad idem (i.e. fraud, mistake and duress).

**5. Payment systems and Payment Gateways**

Various payment gateways and systems have emerged as a result of the increasing need for online commerce and security. Some of the most secure payment systems, such as Skipjack, provide businesses less information about customers' payment methods (debit/credit card numbers).

Merchant-initiated and customer-initiated online payment options are available through Skipjack. When a business collects a client's credit card number directly from the consumer, it is known as the "merchant initiated technique." In the merchant initiated method, Skipjack encrypts the customer's payment information and transmits it to the issuing bank for authorisation when a merchant employs Skipjack's merchant initiated method. Using Skipjack's customer-initiated payment method, a merchant generates a secure payment form in Skipjack and embeds it on his or her website for payment. Skipjack's secure payment form allows customers to submit their payment information immediately. This technique, like the one we've recommended, sends the payment details of a consumer straight to the payment gateway. The only information Skipjack sends to retailers is the kind of credit card and the last four digits of a debit/credit card. However, businesses can choose whether or not to verify a customer's CCV number.

When a debit or credit card is used, the CCV security code ensures that the card's owner is the one making the purchase. Additionally, the CCV security code aids a credit card issuer in verifying the data of a credit card and the identity of the card owner. All credit/debit card issuers utilise it as an additional layer of defence against fraud. A merchant that does not ask for the customer's credit card CCV number is thereby hindering the card issuer's ability to authenticate the card and the cardholder's details. Nowadays, the majority of credit card providers and retailers will not process a purchase if it does not include a CCV number. Despite the fact that Skipjack provides a safe method of payment, it does not offer a totally safe environment for online transactions.

**Sequence of Steps in a Payment System**

The standard sequence of steps used in the current payment system is as follows:

a) A consumer visits a merchant's website and chooses the products he wants to purchase. He adds them to his online shopping basket and proceeds to check out.
b) In order to complete the transaction, the consumer must supply the merchant with his or her credit card information. A customer's debit or credit card information is included in payment information.
c) To authorise the customer's payment, the merchant sends the payment details to a payment gateway.
d) If the customer's payment information is accurate, the payment gateway authorises it. A payment capture token is subsequently sent to the merchant by the payment gateway. Tokens are messages sent to a merchant indicating that a payment has been authorised. When requesting a payment through the payment gateway, the merchant must supply the payment capture token information.
e) The merchant notifies the consumer that the payment has been authorised after obtaining the payment capture token from the payment gateway.

f) Customers' bought goods are delivered to them and the payment gateway is contacted to collect payment. To request payment for a purchase, a merchant provides the payment capture information obtained from the payment gateway.
g) The payment gateway verifies that the merchant's payment capture information is correct. The money is sent to the merchant if the payment gateway verifies the transaction.

**6. Secure Online Payment System**

While shopping at an online store, the consumer selects the things they wish to purchase and places them in their online shopping basket (located on the store's website). Checkout is where he goes when he's ready to buy those products During checkout, a consumer supplies the merchant with his shipping and billing address, as well as payment information (e.g., debit or credit card details). Merchants get the customer's credit card information when they utilise online payment systems such as Verified by Visa and SecureCode, J/Secure and SafeKey. It is encrypted or hashed before it is given to the merchant so that the merchant cannot access it. The merchant sends the payment gateway the customer's payment details so that he can be paid for his sale.

Even in encrypted or hashed form, a customer's payment information is not secure to give to an online retailer via the World Wide Web (WWW). The danger of financial exploitation and fiduciary abuse increases when personal financial information, even if encrypted, is provided to an online retailer.

Getting paid for the stuff sold is the main worry of an internet merchant when he sells his products. Merchants can accept payments directly from customers, without having to get their credit card or bank account details, if a consumer submits this information to a third-party payment gateway.

**7. Conclusion**

Merchants keep certain information about consumers when they send payment information to a payment gateway on behalf of their customers. Payment information (such as the last four digits of a credit or debit card number or encrypted credit/debit card details) can already be stored by retailers as part of the existing payment system. It's done this way so that businesses can establish the legality or existence of a transaction in the event of a dispute or a chargeback. It is important to solve these problems when businesses do not have access to client payment information since customers supply this data themselves directly to an online payment gateway.

1. Payment gateways need to identify merchants and ensure their authenticity before authorizing payments;
2. The validity of a purchase should be determined by payment gateways before authorizing payments to merchants;
3. When making a transaction, payments should be made only to legitimate merchants;
4. Most importantly, merchants should be able to obtain purchase information and prove the legitimacy of their payment.

**References**

[1]. Jiangtao Li and Ninghui Li. OACerts : Oblivious Attribute Certificates, CERIAS and Department of Computer Science, Purdue University
[2]. Mohamed Nabeel, Elisa Bertino. CloudMask : Private Access Control in the Cloud, Purdue University, West Lafayette, Indiana, USA
[3]. Ning Shang, Mohamed Nabeel, Federica Paci, Elisa Bertino. A Privacy-Preserving Approach to Policy-Based Content Dissemination, Purdue University, West Lafayette, Indiana, USA
[4]. TorbenPryds Pedersen. Non-interactive and information theoretic secure verifiable secret sharing in CRYPTO'91: Proceedings of the 11th Annual International Cryptology Conference on Advances in Cryptology, London, UK: Springer-Verlag, 1992, pp 129-140
[5]. Dalal, S. &Athavale, V. (2012). Analysing Supply Chain Strategy Using Case-Based Reasoning. Journal of Supply Chain Management Systems, 1(3), 40-48.
[6]. Dalal S., Agrawal A., Dahiya N., Verma J. (2020) Software Process Improvement

Assessment for Cloud Application Based on Fuzzy Analytical Hierarchy Process Method. In: Gervasi O. et al. (eds) Computational Science and Its Applications – ICCSA 2020. ICCSA 2020. Lecture Notes in Computer Science, vol. 12252. Springer, Cham. https://doi.org/10.1007/978-3-030-58811-3_70

[7]. Seth B., Dalal S., Kumar R. (2019) Hybrid Homomorphic Encryption Scheme for Secure Cloud Data Storage. In: Kumar R., Wiil U. (eds) Recent Advances in Computational Intelligence. Studies in Computational Intelligence, vol 823. Springer, Cham.

[8]. S. Pradeep and Y. K. Sharma, "A Pragmatic Evaluation of Stress and Performance Testing Technologies for Web Based Applications," in 2019 Amity International Conference on Artificial Intelligence (AICAI), 2019, pp. 399–403.

[9]. Panthee, M., & Sharma, Y. K. (2019). Review of e-government implementation. International Journal of Recent Research Aspects, ISSN: 2349-7688, 6(1), 26–30.

[10]. Y. K. Sharma and M. D. Rokade, "Deep and Machine Learning Approaches for Anomaly-Based Intrusion Detection of Imbalanced Network Traffic.," IOSR Journal of Engineering, pp. 63-67, 2019.

[11]. Bijeta Seth, Surjeet Dalal, Dac-Nhuong Le, VivekJaglan, NeerajDahiya, Akshat Agrawal, Mayank Mohan Sharma, Deo Prakash, K. D. Verma, Secure Cloud Data Storage System Using Hybrid Paillier–Blowfish Algorithm, Computers, Materials & Continua, Vol.67, No.1, 2021, pp.779-798, doi:10.32604/cmc.2021.014466

[12]. Sunita Saini, Dr.Yogesh Kumar Sharma, "LI-Fi the Most Recent Innovation in Wireless Communication", International Journal of Advanced research in Computer Science and Software Engineering, Volume 6, Issue 2, February 2016.

[13]. Shuchen Yu, Cong Wang, Kui Ren, and Wenjing Lou. Achieving Secure, Scalable, and Fine-grained Data Access Control in Cloud Computing, Dept of ECE, Worchester Polytechnic Institute, Dept of ECE, Illinois Institute of Technology

[14]. Mohamed Nabeel, Ning Shang, John Zage, Elisa Bertino. Mask: A System for Privacy-Preserving Policy-Based Access to Published Content, Purdue University, West Lafayette, Indiana, USA

[15]. Gelman, A., & Hill, J. (2016). Data analysis using regression and multilevel/hierarchical models. Cambridge University Press.

[16]. Geurts, P., Ernst, D., &Wehenkel, L. (2016). Extremely randomized trees. Springer Science + Business Media, Inc..

[17]. Goodman, B., & Flaxman, S. (2016). European union regulations on algorithmic decision- making and a right to explanation. In ICML Workshop on Human Interpretability in Machine Learning.

[18]. Malik Meenakshi, NandalRainu, Dalal Surjeet, JalglanVivek and Le Dac-Nhuong 2021 Driving Pattern Profiling and Classification Using Deep Learning Intelligent Automation & Soft Computing 28 887-906.

[19]. Hastie, T., Tibshirani, R., & Friedman, J. (2002). The elements of statistical learning: Data mining, inference, and prediction. Biometrics.

[20]. Meenakshi Malik, RainuNandal, Surjeet Dalal, VivekJaglan and Dac-Nhuong Le, Deriving Driver Behavioral Pattern Analysis and Performance Using NeuralNetwork Approaches, Intelligent Automation & Soft Computing, vol.32, no.1, 87-99, 2022, DOI:10.32604/iasc.2022.020249

[21]. Hidasi, B., Quadrana, M., Karatzoglou, A., &Tikk, D. (2016). Parallel recurrent neural network architectures for feature-rich session-based recommendations. In Proceedings of the 10th ACM Conference on Recommender Systems, 241–248.

[22]. Hochreiter, S., &Schmidhuber, J. (1997). Long short-term memory. Neural Computation, 9(8).
[23]. Hofmann, M. (2006). Support vector machines-kernels and the kernel trick. An elaboration for the hauptseminar reading club:support vector machines, 1 –16.
[24]. Hop, W. (2013). Web-shop order prediction using machine learning. Erasmus University Rotterdam.
[25]. Hsu, C.-W., Chang, C.-C., & Lin, C.-J. (2003). A practical guide to support vector classification (Tech. Rep.). Taipei 106, Taiwan: Department of Computer Science National Taiwan University.
[26]. Dalal, S., Seth, B., Jaglan, V. et al. An adaptive traffic routing approach toward load balancing and congestion control in Cloud–MANET ad hoc networks. Soft Comput (2022). https://doi.org/10.1007/s00500-022-07099-4
[27]. Yogesh Kumar Sharma et al. "Designing enhanced Security Architecture for 5G Networks", International Journal of Management, IT & Engineering, ISSN: 2249-0558, Vol. 8, Issue 8(1), Pp. 73-83, Aug. 2018.
[28]. Yogesh Kumar Sharma et al. "Framework for Privacy Preserving Classification in Data Mining", Journal of Emerging Technologies and Innovative Research, ISSN: 2349-5162, Volume No. 5, Issue No. 9, pp. 178-183, Sept. 2018.
[29]. Yogesh Kumar Sharma et al. "Critical Study of Software Models Used Cloud Application Development", International Journal of Engineering & Technology, E-ISSN: 2227-524X, Volume No. 7, Issue No. 3.29, pp. 514-518, 2018.
[30]. Yogesh Kumar Sharma et al. "Project Virtualization Task Scheduler: A New Contribution to Green Cloud Computing", International Journal of Engineering Inventions (IJEI), ISSN (e): 2278-7461, ISSN (p): 2319-6491, Vol. 07, Issue 09, Pp. 43-46, Sept. 2018.
[31]. Yogesh Kumar Sharma et al. "Latest Review of Literature for Understanding Traditional Project Management Challenges and Need of Enterprise Cloud Project Management Practices", International Organization of Scientific Research Journal of Engineering (IOSRJEN), ISSN (e): 2250-3021, ISSN (p): 2278-8719, Vol. 08, Issue 10, Pp. 1-5, Oct. 2018.
[32]. Yogesh Kumar Sharma et al. "Enhanced Technique for LSB Based Security in Digital Color Images Using Visual Cryptography", Journal of Computational Information Systems, ISSN: 1553-9105, Vol. 14, Issue 6, Pp. 81-88, Nov. 2018. 39. Paper published in International Journal of Management, Technology and Engineering, "Mobile Banking - How secure it is", ISSN: 2249-7455, Vol. 8, Issue XI, Pp. 24-28, November 2018.
[33]. Kukreja, S., Dalal, S. (2018). Performance Analysis of Cloud Resource Provisioning Algorithms. In: Saeed, K., Chaki, N., Pati, B., Bakshi, S., Mohapatra, D. (eds) Progress in Advanced Computing and Intelligent Engineering. Advances in Intelligent Systems and Computing, vol 563. Springer, Singapore. https://doi.org/10.1007/978-981-10-6872-0_57
[34]. Yogesh Kumar Sharma et al. "security-in-digital-images-using-visual-cryptography-scheme", Journal of Computational Information Systems, ISSN: 1553-9105, Volume No. 14, Issue No. 6, pp. 49-57, Nov. 2018.
[35]. S. Dalal and U. Jindal, "Performance of integrated signature verification approach: Review," *2016 3rd International Conference on Computing for Sustainable Global Development (INDIACom)*, 2016, pp. 3369-3373.
[36]. Yogesh Kumar Sharma et al. "Web Page Classification on News Feeds Using Hybrid Technique for Extraction", "Information& Communication Technology for intelligent system", Series Print ISSN 2190-3018, Series

Online ISSN 2190-3026, Print ISBN 978-981-13-1746-0, Online ISBN 978-981-13-1747-7, Vol.-107, Issue-6, Pp.-399-405, DOI: https://doi.org/10.1007/978-981-13-1747-7_38, Dec. 2018.