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Research Article

The Best Decision for E-Commerce Funds Transfer Based on Cloud Computing Technique

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Cloud computing offers an efficient, scalable, and flexible platform; through techniques and methods proven by it, many complex projects were successfully carried out. It provides consumers the opportunity to interact with previously unknown ease to measure sources and connections to IT-managed services. Online shopping has been considered as one of the commonly used channels for easy shopping in the Internet world and becomes a convenient way to search for products from various places and to make the operation quicker. The digital economy is powered by high-speed Internet connectivity launched by IT as a practical platform for interaction between online shopping and organizations. The platforms for e-commerce have led to extensive international access by local consumers to goods and services. E-commerce has improved productivity in enterprises and has added to the economies in the countries of the business industry. However, e-commerce security is the primary concern to protect details from electronic theft such as credit card or debit card fraud, retailer, or bank leakage of details while a card is not used for purchases online. In this paper, Cloud Computing-Based Multilevel Decision Support System (CCMDSS) has been proposed for secure fund transfer in the e-commerce platform. Furthermore, this study utilizes cryptography techniques and multiple networks to safeguard the security of information and decrease the systematic risks. The experimental results show that the proposed method enhances the efficiency and feasibility and secures the information while transferring the money. Compared with other models, Prediction Ratio validation has a significant improvement, and the error rate is greatly reduced, only 5.99%. Multiple data prove that the comprehensive performance of CCMDSS model ranks among the top among existing models.

1. Introduction and Background Survey

In the past decade, the number of online markets has exponentially increased. Mostly in rural places where these services have not been available previously, consumers had exposure to these markets [1]. Online markets have reduced the cost of buying and selling, giving small dealers the chance to run their enterprises, which encourages the previously impossible exchange of goods and services [2, 3]. It is really necessary for dealers to preserve and develop trust to ensure that their marketplaces to procedures are stable enough for consumers to utilize the business safely [4]. Currently, the Internet is commonly used in the business and everyday lives of customers for communications [5–7]. The main objective of the online sector is to preserve the confidence between the consumer and the merchant, which can be achieved if the above is taken into consideration [8]. The level of resources must be perfect for online shopping. The system needs to be very secure [9] and currently, protection is a major challenge on the online network when attackers or hackers technically improve their security [10]. Trading of goods or services via computer networks, such as the Internet, implies e-commerce or electronic commerce [11]. It is the marketing part of e-business and consists of data exchange for funding, payment, and protection of corporate transactions [12]. E-commerce is applied to a wide variety of goods and services industries online [13]. It may be difficult to maintain the level of trust necessary in the authenticity and privacy of such transactions in exchange over an unsecured public network such as the Internet [14]. E-commerce often

concerns any type of business transaction that includes electronically interacting parties instead of actual transactions or direct physical contact [15]. A security objective is the benefit of safety to be accomplished by the program. In developing an efficient e-commerce enterprise, protection has emerged as an extremely important topic [16]. Access to confidential information and replay are specific risks to e-commerce networks levied by hackers [17]. The security of the privacy of customers has become a major concern with growing identity fraud and exploitation, and customer interest must be regarded to be a core problem for e-commerce providers [18–20]. Figure 1 shows the digital e-commerce cycle.

Cloud computing enables companies to conduct business without IT systems being developed and managed. E-commerce helps companies to offer goods online without needing to reserve an office space physically [21–24]. Today almost all e-commerce firms utilize cloud infrastructure to their benefit [25, 26]. Cloud plays a key position in the smart economy and future legislative reforms required to introduce efficient solutions by the usage of cloud infrastructure resources [27, 28]. The cloud infrastructure, the Internet, and remote networks are used to manage customer data and devices. This helps clients and businesses to work without installation of applications and to reach their personal accounts, data, and documents via the Internet at any part of the globe. It also provides the dynamic ability for storage, computing, data, and information sharing through networks. For end-users, it is a cost-effective choice, in which "pay as a service" is provided to IT-related capacities that allow users to access Internet technology that offers and delivers information technology resources to consumers according to their requirements [29]. Cloud infrastructure offers e-commerce businesses with the potential to reduce personnel, financial, and resource expenses for running e-business applications and even provide backend resources or apps. Cloud computing service providers can manage all of these tasks [30–32]. E-commerce is a traditional market that carries out cloud resources' functionality. This paper explores the impact on the e-commerce sector of cloud computing and presents an important suggestion for enhancing e-business in the cloud environment [33–35].

In this paper, the Cloud Computing-Based Multilevel Decision Support System (CCMDSS) has been proposed for secure fund transfer in the e-commerce platform. The customer is normally the guiding force behind a business transaction and must provide convenient access to an online sector by infrastructure. Therefore, other potential applicants would not compete in the new sector that might place all the e-commerce benefits in danger. To all market participants, security and fairness are important. For example, if safe payment can not be assured, seller shall not sell products. The same refers to an application. Therefore, it is important to recognize all the security threats of business activity to build confidence in e-commerce transactions and supporting infrastructure. All security-related information involved in handling the transaction has to be closely evaluated. It is called company transaction security semantics awareness [36].

The author suggested text-based steganography and visual cryptography techniques (TBS-VCT) for e-commerce transactions. This paper suggests a modern approach for presenting minimal details required and hides certain secret third-parties information that is available to the bank during the electronic transaction. This enables us to safeguard clients data, enhance client confidence, prevent misuse on the merchant's side of the information, and prevent anybody from hacking or viewing network information that minimizes sharing of information between consumers and online traders and enables successful transfer from consumer to marketer's account to safeguard consumer information. This enables us to protect the client's data.

Cui et al. [37] proposed the sequential multimethod approach (SMMA) and demonstrated on the information system success model (ISSM) valence framework (VF) to conceptualize cross-border e-commerce. In a qualitative analysis, they performed interviews with Chinese international e-commerce sales representatives to determine the main issues concerning such vendors and why they were interested in cross-border e-commerce. In addition, their work developed new operational definitions for system quality, quality of service, perceived benefits and perceived costs relevant to cross-border e-commerce.

Ren et al. [38] introduced the deep learning-based one-step integration optimal decision-making approach S2SCL (Seq2Seq based CNN-LSTM) for e-commerce interrelated third-party forwarding logistics processes. Seq2Seq's integrated LSTM and CNN network forecasting architecture can model system dependency and dynamics related relations in different logistics services demands. The suggested method can quantify demand uncertainty through a dynamic distribution in addition to generating point forecasting results and a variety of optimal decisions for logistics service allocation.

Dijesh et al. [39] initialized the RSA encryption algorithm (RSAEA) for e-commerce security. This paper discusses asymmetrical methods that are critical in defining electronic commerce transactions and other supporting cryptography algorithms. This study explains the key security issues in electronic commerce. Some secure arrangements that offer adequate access to transaction details of any person in electronic commerce activity need to be enforced to avoid problems of protection. This study helps control decryption and encryption while using the recipient and sender private and public keys.

Ardiansah et al. [40] proposed Structural Equation Modeling (SEM) for analyzing the result of electronic payments security on e-commerce consumer perception. The findings of this analysis reveal a better mediating impact on e-payment protection and the buying preferences of consumers. The perceived ease of utilization has a considerable indirect influence on e-commerce customers buying intentions through e-payment security. The perception of the convenience and accessibility of the protection dimensions of payment often impacted the buying decisions of e-commerce customers. The findings increase the understanding of electronic transactions' stability.

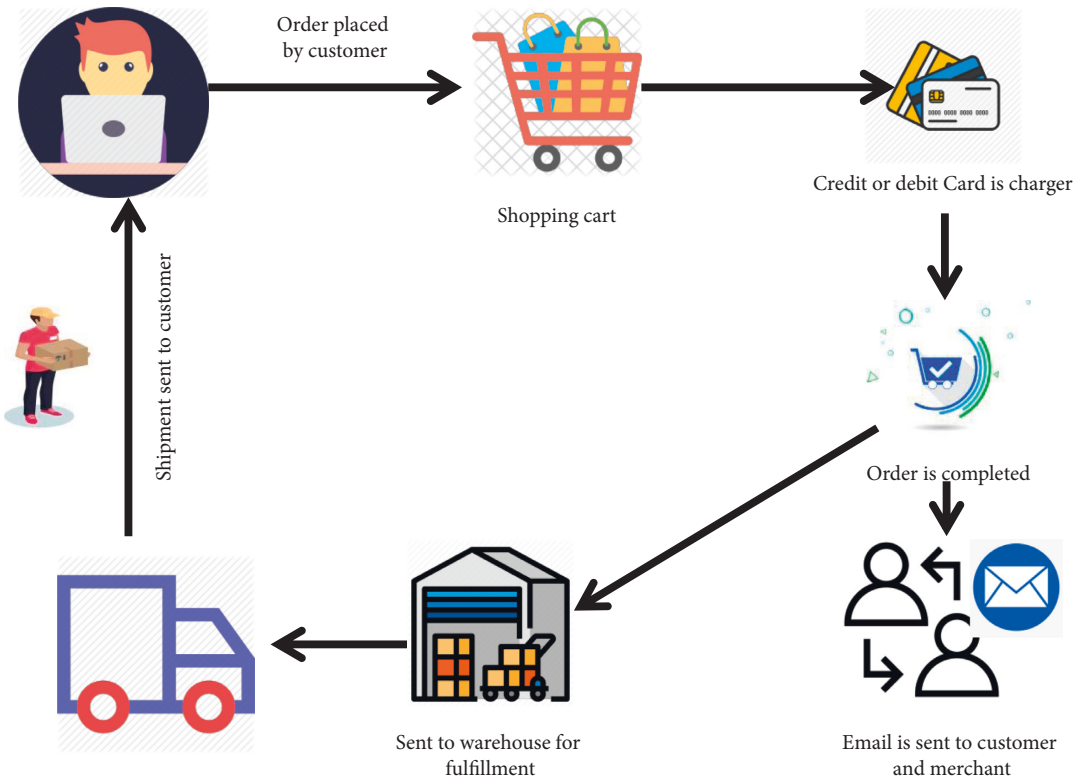

Figure 1: Digital e-commerce cycle.

The models designed by the above representative studies have their own advantages. Ren Shuyun's design model pursues response speed, while Dijesh P's design model makes outstanding contributions to confidentiality. But taken together, these models ignore the optimization of overall performance while highlighting the strengths of one aspect. In order to achieve the optimal design of the overall performance, the model has no obvious shortcomings in the architecture; in this paper, the Cloud Computing-Based Multilevel Decision Support System (CCMDSS) has been proposed for secure fund transfer in the e-commerce platform. Cloud computing can be defined as a computing style that provides multiple external customers with massively skillful IT-related capabilities as an Internet service. The cloud infrastructure, as the new paradigm of operation, offers modern information assets sharing and control systems with network storage and on-demand exposure to data. Under existing conditions, cloud computers provide business applications (B2B and B2C) for companies with lower investments. Currently, e-commerce and cloud-based analysis combinations are technologically oriented, and the cloud-based application platform for e-commerce would, therefore, has a strong practical value. Cloud and e-commerce are two catchwords nowadays and are evolving as vital technology.

The major contribution of the article is as follows:

(i) Propose the Cloud Computing-Based Multilevel Decision Support System (CCMDSS) for secure fund transfer in the e-commerce platform.

(ii) On the basis of synthesizing the existing research results, analyze the advantages and disadvantages of various representative models, while absorbing the advantages, avoid excessive pursuit of a single function, and realize the optimization of the overall performance of the design model, designing the statistical model of a decision support system to make a decision while transferring the money through the Internet.

(iii) The experimental results have been performed, and the proposed method enhances the efficiency, feasibility, and security when compared to other existing approaches.

The remainder of the paper is discussed as follows: Sections 1 and 2 discussed the background and existing approaches of cloud computing based e-commerce. In Section 3, the Cloud Computing-Based Multilevel Decision Support System (CCMDSS) has been proposed. In Section 4, the numerical results have been performed. Finally, Section 5 concludes the research article.

2. Cloud Computing-Based Multilevel Decision Support System (CCMDSS)

In this paper, the Cloud Computing-Based Multilevel Decision Support System (CCMDSS) has been proposed for secure fund transfer in the e-commerce platform. Online technology provides a wide variety of resources, including electronic mail, file transfers, etc. and "electronic commerce"

(or e-commerce) is one of the most common services on the Internet. The technology of e-commerce is rapidly transforming the way businesses are managed. The way consumers use financial facilities has changed with Internet transactions. Customers need not go ATM or stay online in a bank branch to withdraw or transfer money from their accounts but just sign into the platform of the bank offering Internet banking facilities, including money from customers' accounts. Although consumers cannot accept the actual currency, they may move money to electronic cards and carry them into the shop to purchase goods or services. In fact, when utilizing Internet banking systems, consumers are able to pay bills or plan monthly bill payments. In the Internet business, e-commerce essentially simulates and improves conventional ways in which people conduct their business or communicate electronically with each other. Depending on business transactions, several e-commerce websites allow their customers to navigate remotely over their customers' personal computers for goods and services accessible in their virtual stores. Electronic goods like music, video clips, digital images, or novels can be supplied, not physical goods (e.g., https://www.amazon.com/) or laptop (e.g., https://www.flipkart.com/). Credit card payment is the most common type of e-payment method. According to this process, consumers may make a purchase via a compatible credit card payment network supplied by the shop by choosing the desired products from their online shop by simply inserting their credit card number and related details for identification and payment authorization purposes, or billing address. This detail is passed to the payment card company of the consumer to verify the validity of the payment.

It is an extremely hard task to protect user identifications and account specifics in public cloud services providers and other malicious users. As a result, a trustworthy generic framework for protecting online bank information and user credentials has been investigated in the public cloud. The key components suggested as part of the reliable structure are fingerprint authentication protocol, a verification protocol for access rights and a path to data privacy and security protections in the public cloud. Take into account that the user authentication keys, authorization allocations, and search tables are processed and managed with highly secured domestic and trustee databases. Figure 2 shows the architecture of the proposed CCMDSS method.

A consumer who needs to take advantage of online banking must register at the bank before the creation of transactions. At first, he must apply his or her personal ID records, such as constant address certificates, mobile numerals, and, most importantly, a fingerprint for authentication along with account information. In this case, the user will select a personal identity (UID) and password to get a new concept. There are few restrictions on the need for a password to include at least one digit, a control character, and a punctuation symbol. Follow applicable rules and regulations to establish, and lock and reset passwords during our introduction of this registration process. The growth in the independent processing capabilities of different users has been a key factor for future signs of progress since it has assisted in reducing the significance of departments of information systems. New styles of technologies and frameworks have brought subsequent light developments: the management of corporate information systems and strategic data systems assisted the decision-making phase. Secure Sockets Layer (SSL) is a networking protocol intended to secure networks across insecure networks such as the Internet between web servers and web clients. DSSs incorporate statistics and mathematics to assist decision-makers in their function. The total availability of services may be described in the sense of data-oriented decision support where the DSS gives feedback and is expected to be accurate based upon such results to the likelihood of appropriate decisions. A DSS comprises three main components: a user interface, a model base, and database. A warehouse or database management system (DBMS) contains organized, real-time records, for instance, consumer accounts, which form the basis of the DSS and provide definitive quantitative analytical assistant records for critical problems. The base model (DBMS) contains one or more models for the type of analytical analysis in which the system will accomplish tasks. The incorporation of data collection synthesized data and details from the database represents the internal essence of a wide variety of data and allows contextual interpretation by way of technical reasoning for assistant decision-makers. The user interface incorporates both into a consistent framework that gives input to the decision-maker. Such primary bodies are compatible and interconnected.

Definition 1 (electronic payment system). The payment system W is stated as a group of the following definitions:

$$W = \{H, CE, PT\} \cup \text{Goals} \cup PR \cup \text{Tse} \cup \text{Trust}. \quad (1)$$

As shown in (1) H is the set of engaging parties in payment system W, CE is the communication environment which is self-possessed of a payment network and devices, PT depicts a payment protocol, and PT is the payment transactions which denotes actions corresponding fund transfer executed by engaging parties in H in the communication environment in W. Goals represents the set of objectives of engaging parties concerning the PT. PR denotes the set of parties needs for PT, Tse denotes the set of transaction security elements, and confidence denotes the trust relationships among engaging parties in H. A Short Message Service Center (SMSC) is a mobile network element. The purpose of this service is to store, convert, forward, and deliver messages for the SMS. The full 3GPP SMSC classification is the SMS Support-Service Center (SMS-SC). Figure 3 shows the payment scheme.

Definition 2 (engaging parties). The payment system W consists of a set of engaging parties H, where $H = \{D, N, J, B, \text{PSP}\}$.

D denotes a customer who needs to purchase goods and services from a merchant N. D performs as a payer in W. D keeps certified payment data delivered from J. N denotes the merchant creating an account with an acquirer (N's bank) B. N has approval from a payment system provider

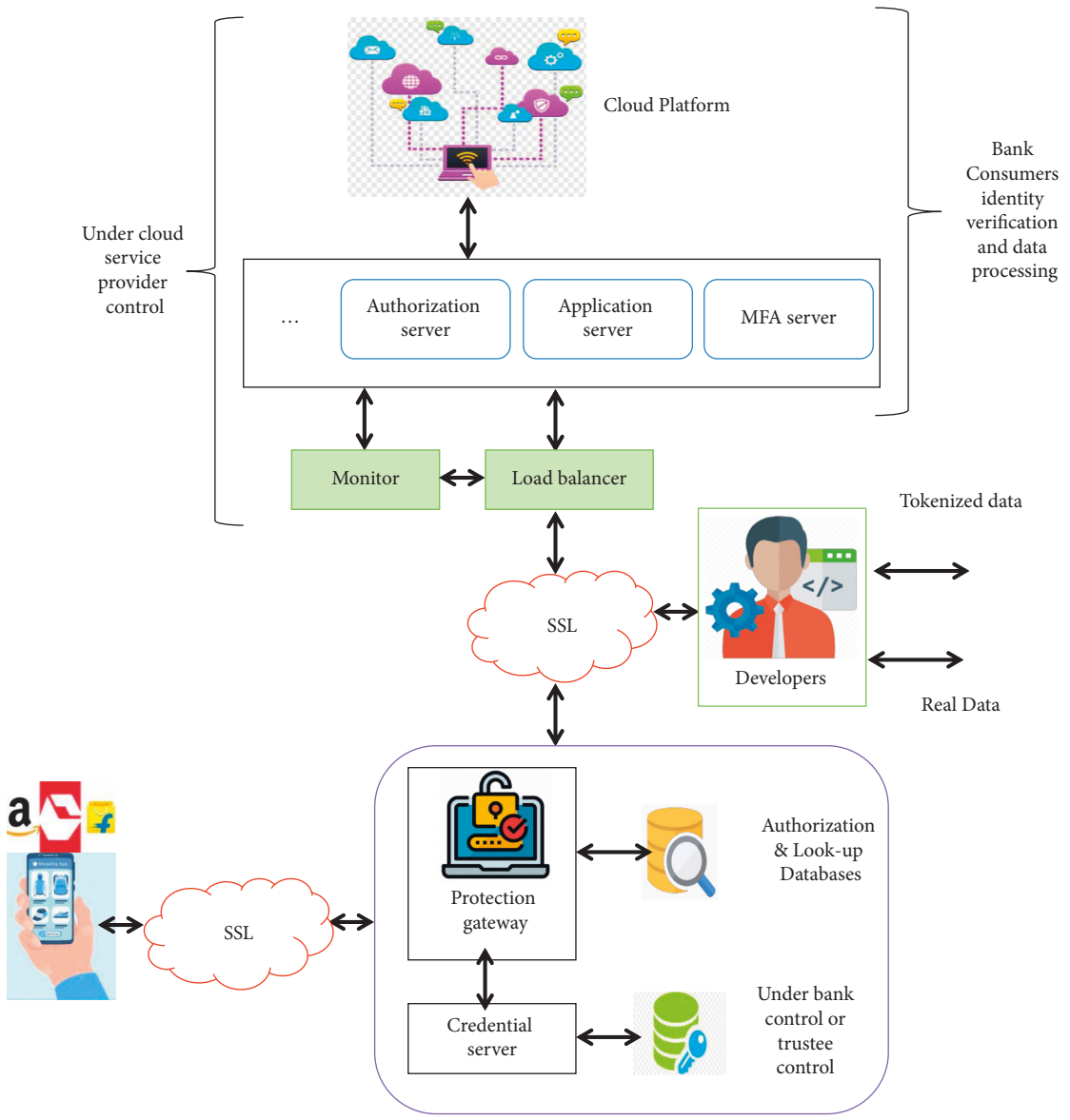

Figure 2: The architecture of the proposed CCMDSS method.

PSP to execute transactions in W. N acts as a payee in W. PSP represents issuer (D's bank) J and acquirer B adjacent on the Internet and transacts on behalf of D and N on the private banking network side. The payment system provider can be functioned by a mobile operator, a bank, or a credit card company. As a result of this approach from PSP, J and B indicate the issuer and buyer making payment clearances. A private banking network carries out payment clearing.

Definition 3 (communication environment). CE is stated as the following expression:

$$CE = \{H, C, M\}. \tag{2}$$

In the communication environment, the engaging parties in H, utilizing a set of Internet-manageable payment system C, communicate to one another over a group of communication networks M. Commonly CE can be categorized into the wireless environment and fixed environment FE.

$$CE = WE \cup FE. \tag{3}$$

The wireless environment WE is stated as the following set:

$$WE = \{H, WD, WN\}. \tag{4}$$

As inferred from equation (4) $WE \subseteq CE$, $WD \subseteq C$, and $WN \subseteq M$. WD denotes the set of Internet-accessible wireless payment devices.

The fixed environment FE is stated as the following set:

$$FE = \{H, FD, FN\}. \tag{5}$$

As discussed in (5), $FE \subseteq CE, FD \subseteq C$ and $FN \subseteq M$. FD indicates a set of Internet-manageable payment systems

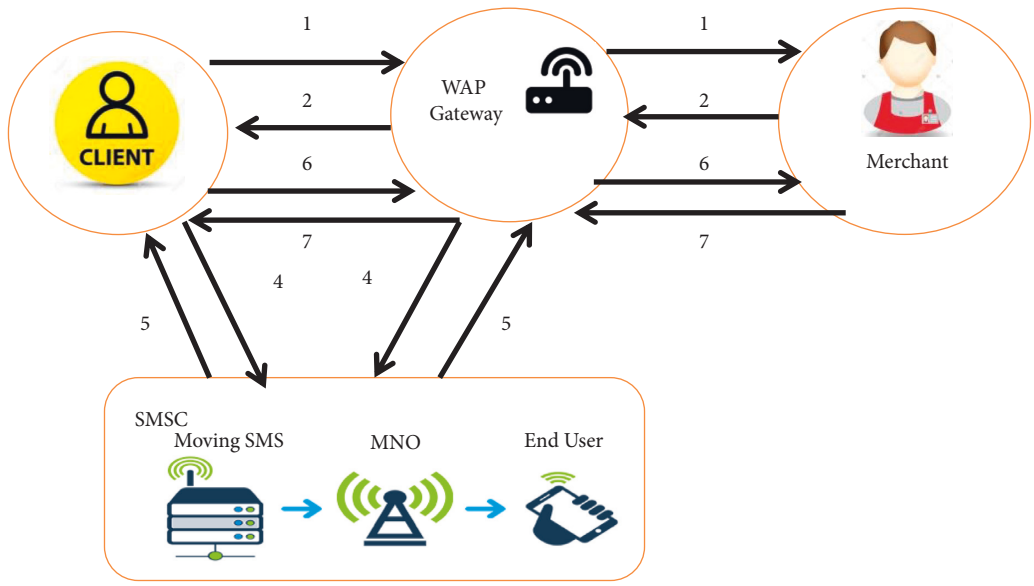

Figure 3: The payment scheme.

functioning fixed network FN detained by engaging parties in H.

The relationship between wireless and fixed devices is expressed as

$$C = WD \subseteq FD. \tag{6}$$

WN denotes a set of wireless communication structures in which the member of H communicates with another one. WN composes the number of wireless connections within the devices in WD. From the definitions of wireless and fixed networks, the following relationship can be expressed as

$$M = WN \cup FN. \tag{7}$$

Definition 4 (payment transactions). The payment transaction PT is stated as a set of actions ACT concerning fund transfer executed by engaging parties in H over a set of communication networks M. PT can be depicted as follows:

$$PT = \{H, C, ACT, M\}. \tag{8}$$

In other words, from (2) and (8), the payment transaction PT can be depicted by the number of actions ACT concerning payment token transfer in the CE.

$$PT = \{CE, \text{ACT}\}. \tag{9}$$

ACT is stated as the following set:

$$\text{ACT} = \{PO, DB\ , CD, PC\}. \tag{10}$$

As derived in (10), PO is the payment order, DB is the debit, and CD denotes credit and PC denotes the payment clearing.

The payment order is the interaction between D and N where D requests to purchase goods and services from N. PO can be expressed as

$$\text{PO} = \text{payment order}(D, N, T_D) \leftrightarrow \text{payment order}(N, D, T_D). \tag{11}$$

As shown in (11) payment order(D, N, T_D): D requests N to purchase goods and services with the amount T_D, where T_D is the payment token demanded by D. payment order(N, D, T_D): N responses to D's request concerning the order with the amount T_D.

Payment clearing is the interaction between J and B to transfer the amount bid by D and N between their accounts. Generally, this type of transaction is executed under private bank networking. PC is depicted as the following expression:

$$\text{Payment clearing}(J, B, D, N, T_D, T_N). \tag{12}$$

In relation to the above expression, the amount T_D is transferred from D's account to N's account by J and B. PC can be expressed by

$$\text{debit}(J, D, T_D) \Lambda \text{credit}(B, N, T_N) \longrightarrow \text{Payment clearing}(J, B, D, N, T_D, T_N). \tag{13}$$

From the above definition, payment clearing will be established if J has taken away the payment token T_D from D, and B has transferred the token T_N to N. In addition, J and B in this definition can be rewritten by PSP under the same state as

$$\text{debit}(\text{PSP}, D, T_D) \Lambda \text{credit}(\text{PSP}, N, T_N) \longrightarrow \text{Payment clearing}(\text{PSP}, D, N, T_D, T_N). \quad (14)$$

Three widely referenced service models have been used in cloud computing. SaaS (Software as a service): This denotes that the end-user uses the website over the Internet on a remote basis. Examples for this model are CRM (Customer Relationship Management) and Amazon Web Services' data center. PaaS (Service Platform): Google's Android App Store is the best example of PaaS. It is mainly intended for developers who need to organize their apps directly on the cloud server and are not worried about the connection to the server infrastructure. IaaS: it offers developers the ability to communicate directly with the infrastructures of servers to the highest possible level. It enables them to deploy and remotely control their own applications. In the present industry, SaaS is the dominant model. Figure 4 shows the model of cloud computing.

Cloud computing allows consumers and users to accomplish seamless access in different occasion, regardless of computer resources and shop. At the same time, e-commerce helps consumers to buy goods anywhere in the world. The cost can be measured on the basis of a company's requirements. Cloud computing enables companies to reduce costs, including hardware procurement, protection, confidentiality, energy, and maintenance. The availability of cloud data is an essential consideration for everyone. The network interference or knowledge leakage has been successfully protected by the introduction of various guidelines drafted by specific organizations such as ISO for cloud providers. The definition of confidence cannot be established easily; however, many cloud computing users agree on the value of openness in cloud computing trust issues. Companies will make it transparent that service providers fully meet with protection requirements and best practices. The safest choice is usually to store data in the cloud for e-commerce applications. The opportunity to scale depending on the needs of cloud customers or organization is one of the main benefits of cloud computing. Many processes, such as server initialization, raise processing capacity and reallocate loads due to increasing consumer or client demands, which will take place rapidly. It describes the scalability and versatility of the cloud to delegate extra services as they are needed and disposed of when the cloud users do not need them anymore. Scalability helps to optimize the amount of pressure during the use of the road. Therefore, cloud service for the store is again less expensive.

3. Experimental Results and Discussion

3.1. Electronic Payment Performance. The study showed that electronic banking (e-mobile and ATM transactions) had a strong and significant effect on bank performance, whereas e-direct and SMS alerts did not significantly influence banks' performance. For this cause, it is proposed that more awareness be made of the many advantages of the E-Mobile services utilized by customers of the bank, as its enhanced use would contribute to an improvement in the banks' results. This evolution created mixed feelings in terms of bank performance in terms of profitability, anticipated returns, and risk exposure. In developing markets, the majority of deposit money banks have raised income through sustained growth. Figure 5 shows the electronic payment performance using the CCMDSS method.

3.2. Prediction Ratio Validation. It enhances the education and training of e-commerce in undertakings to improve organization awareness of security, adopts a multilevel network and encryption that guarantees the security of information, enhances risk analysis, prevention, and control to reduce system risk, and completes legislation on e-commerce to ensure the interests of all parties concerned based on capital market line. Research on security strategies for e-commerce will help to improve security techniques for the electronic commerce system, complete management of e-commerce, and create the necessary conditions for the healthy development and new vitality into e-commerce. Online traders can easily carry out dynamic pricing through the placement of cookies on a customer computer to track the previous user interactions with the site. Through utilizing this information, sites may personalize their experiences based on their experience in the past. Online shops will scan the user cookies for details about what items or services you have searched and bought and how much you paid. This knowledge allows them to determine how much good or service customers would be willing to pay for. Furthermore, web usage technology allows a site to trace the way a user tracks different pages on the site based on the market portfolio in correlation with leverage and unleveraged plans. The proposed CCMDSS method enhances the prediction ratio when compared to other existing approaches. Figure 6 shows the prediction ratio of the CCMDSS model.

3.3. Accuracy Ratio Validation. The rising need for fast and reliable user identity and authentication in online transactions has increased. Not all traditional ID solutions focused on ID cards or proprietary details such as a social security number or password are secure together. In the biometrics banking framework, authentication for a variety of applications is fast, simple to use, accurate, secure, and less costly. Enterprises achieve highly accurate, fast, and efficient communication, validation, and execution of all transactions. Electronic banking provides a number of modern, separate telecommunications networks, such as Internet banks, mobile banking, and ATM. Banking and ATM depart from traditional banking brick and engine branches and have rendered banking "everywhere" possible. They helped improve consumer satisfaction through

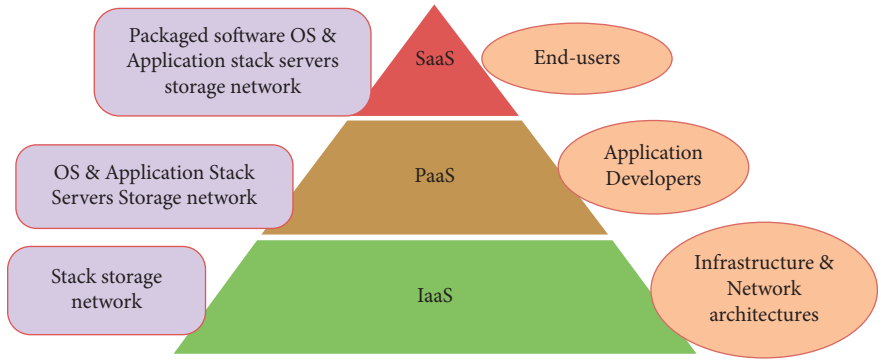

Figure 4: Cloud computing model.

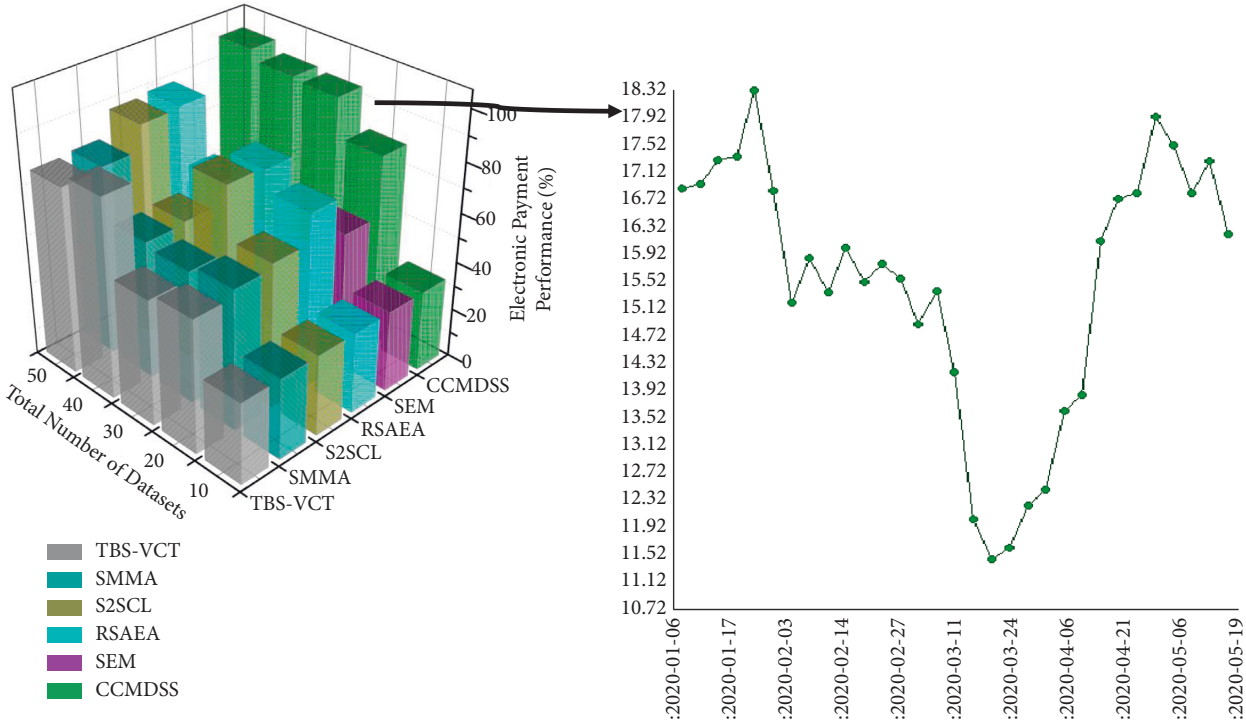

Figure 5: Electronic payment performance.

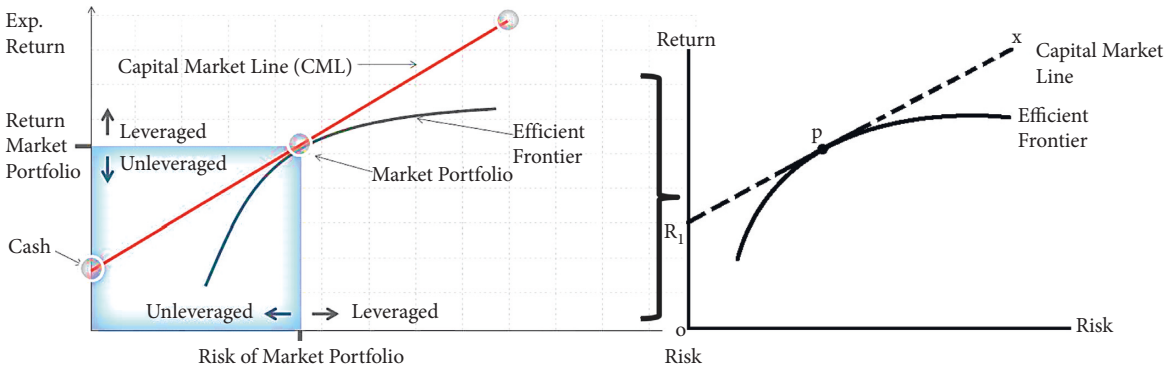

Figure 6: Prediction ratio analysis.

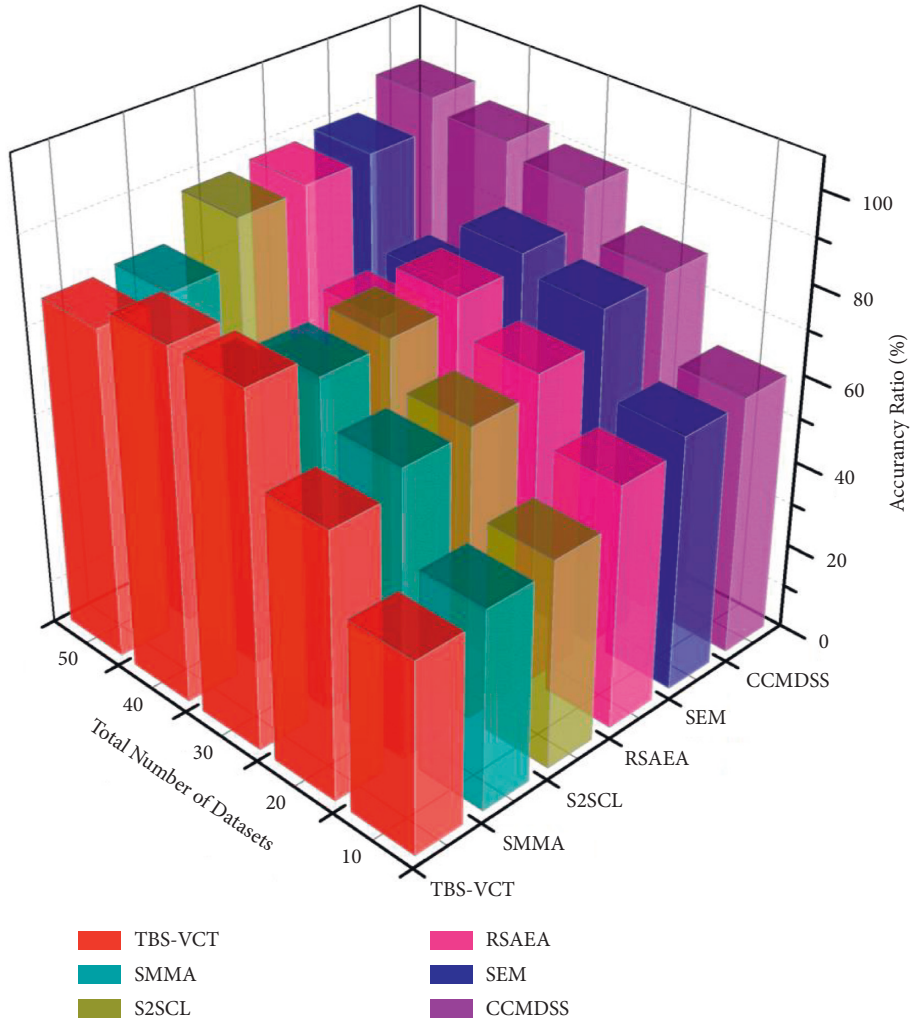

Figure 7: Accuracy ratio analysis.

the size, consistency, and anonymity of customer transactions. Funds are still being passed, checks are taken, and the trade message is obtained electronically with accuracy, speed, and protection. Figure 7 demonstrates the accuracy ratio of the suggested CCDMSS system.

3.4. Error Rate Validation. For an e-commerce business, a secure data transfer is often needed that fulfills the different functions of the data exchange network. Each layer in protocol stack processes and marks the data from its upper layer with a specific method as it can identify the data and decrypt them from the same layers of the other computers. Comparison between encrypted and unencrypted stacks is performed. One application program should adopt an encrypted communication stack, which is a major difference with the nonencrypted communication stack when building the security parameters needed in encrypted communication when data need to be encrypted in transmission. Identity verification is necessary for the negotiating system. The commonly utilized security protocols are security protocols for the transport layer and protocol. Physical layer for security sockets is responsible for sending information to a wireless or wired network, whereas other layers play a role in error detection, correcting, and encryption simply. Figure 8 demonstrates the error rate of the proposed CCMDSS method.

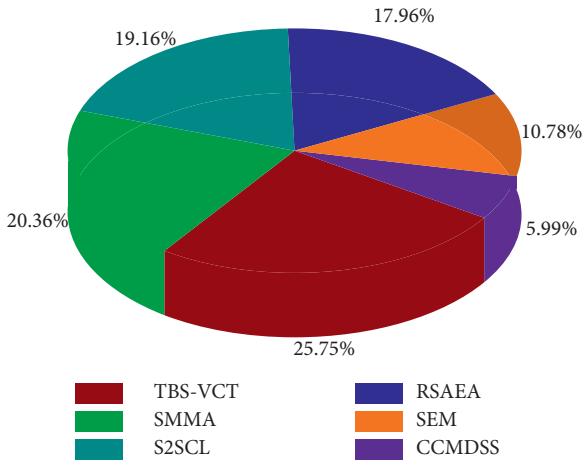

Figure 8: Error rate analysis.

The proposed Cloud Computing-Based Multilevel Decision Support System (CCMDSS) for secure fund transfer in the e-commerce platform and the experimental results show the high performance, accuracy, and prediction ratio with secure fund transfer in e-banking when compared to other existing text-based steganography and visual cryptography techniques (TBS-VCT), sequential multimethod approach (SMMA), deep learning-based one-step integration optimal decision-making approach S2SCL (Seq2Seq based CNN-LSTM), RSA encryption algorithm (RSAEA), and Structural Equation Modeling (SEM) methods.

4. Conclusion and Future Scope

This paper presents the Cloud Computing-Based Multilevel Decision Support System (CCMDSS) for secure fund transfer in the e-commerce platform. In e-banking, as well as in physical banking or other highly secure online transfer systems, the proposed system can be used. The work is a way to look at the impact of the e-commerce strategies being implemented in this country on how e-commerce is being used from a customer and an e-commerce operator perspective. Cloud computing helps companies to use their information equipment and software investment more effectively and provide a means to speed up acceptance. It has enhanced long-lasting acquisition processes for teams and organizations also. As discussed in this paper, cloud computing is crucial for e-commerce because it offers numerous opportunities for e-commerce. Electronic commerce as a service system to help small electronic commerce businesses start their basic needs and upgrade their computer resources as their cloud-based cloud-user base grows over time based on cloud-based characteristics and features. This formation will open a modern area in which e-commerce can be easily developed. Nevertheless, these electronic commerce platforms are in the early phases. An internal and external operation is the framework for the proposed model. SaaS, PaaS, and IaaS are internal services. External services are provided by Internet service providers, information technology service providers, developers of software, cloud users, system integration providers, and hardware providers. Compared with the existing research results, the model designed in this study has made obvious progress in stability improvement and error rate control. It can effectively use the cloud computing model to improve the science and security of e-commerce fund transfer. In further research, the team will focus on how to align the design model with the bank's specific needs. While carrying out simulation practice, strive to cooperate with financial institutions to further optimize the model in real work.

Data Availability

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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