



# E-commerce Network Credibility Modelling Using Block-chain

<sup>1</sup> Asad Ali , Bilal Safdar<sup>2</sup>, Tayyaba Raza<sup>2</sup>, Zainab Riaz<sup>3</sup>

<sup>1</sup>Namseoul University South Korea, asad@nsu.ac.kr

<sup>2</sup>University of Agriculture Pakistan, bilalsafdar175@gmail.com

<sup>2</sup>University of Agriculture Pakistan, tayyabaraza11@gmail.com

<sup>3</sup>National University of Science and Technology Pakistan, zriaz.pg@smme.edu.pk

## ABSTRACT

Agent technology has developed into a sturdy instrument for e-commerce approach in recent years. The use of agent technology in e-commerce systems may address traditional e-commerce weaknesses, respond to the intelligence and individual needs of users, and significantly improve the efficiency of online transactions. There are some weaknesses in the system designed in this paper. The system will be less efficient in order to complete decentralization of the system. Every decentralized node needs to redundantly preserve a huge volume of information that not only takes up a lot of storage space however, it also makes cross-requesting and detail verification ineffective. This writing presents the evaluation of integrity of the e-commerce systems using block-chain and large amounts of data analysis. The fast growth of the Internet, in particular in the well-developed field of e-commerce, has advanced to digital marketing. In order to understand the common code generating conventional file to identify the associated event configuration, we will analyze Improved Practical Byzantine IPBF source code algorithms. The simulation shows the efficiency of the model.

**Key words:** block-chain, e-commerce systems, IPBF, traditional e-commerce

## 1. INTRODUCTION

In physical stores and e-commerce faith plays a prominent role. There is no question that during the buying process buyers will interpret more risk if they lack confidence in the vendors. As previous researchers stated, "trust enhances the creation of e-commerce in all its forms more than technology." The reputation and feedback systems are generally believed to foster the trust, making consumers safe when they purchase on social e-commerce [1].

Note that information cannot always be available, for instance when a new retailer joins the e-commerce industry and an improving infrastructure is unavailable. In these cases, the system should allocate an appropriate reputation to the new supplier, which will enhance its visibility and allow them to interact with established suppliers. As a result, the system is capable of resolving the cold start issue [2].

We are aware of only few researchers which tried to deal with the problem of entrepreneurial credibility setting instead of using a predetermined primary value. The main concept of reputational model modularizing is that relationships between service quality (QoS) characteristics and the maintenance of individual suppliers are initially acquired by samples and then expanded to obtain new vendors' reputational values [2], [3].

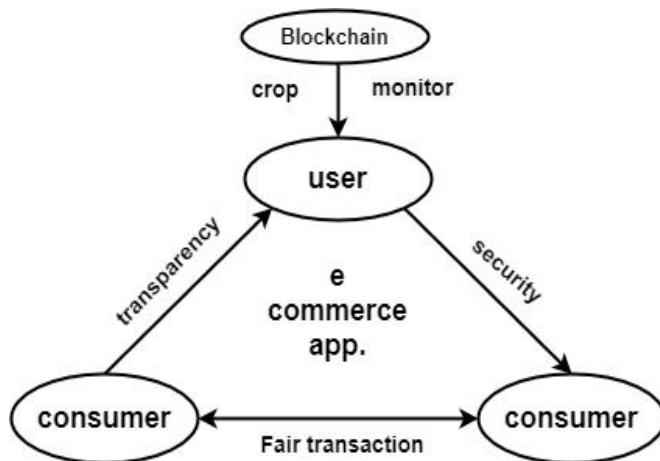
Chinese e-commerce innovation capabilities have progressively changed the economic trend and the way in which commodities are circulated and network products, technology and services' innovation capabilities have increased steadily. As the Internet develops quickly, online marketing has come into being, in particular in an environment that widely uses and develops e-commerce [4].

Whether it's traditional online marketing, forums, video retailing, or event marketing, it can be a powerful driving force. Traditional e-commerce becomes tradition due to mobile e-commerce. Traditional e-commerce is primarily based on wired terminal computers, whereas mobile e-commerce is based mainly on intelligent devices such as mobile telephones [5]. It is not confined to the space and the time that the computer terminal can achieve synchronous control and also offer a forum for B2B, B2C, O2O etc.

Consideration will therefore be given to data mining technology. The calculation of the collection's similarity is an important element in the recovery of similarity. However, it is extremely difficult and tedious to accurately calculate similarity of the set. Estimation of similarities like set, compared to the accurate calculations, is faster, less costly and reaches a compromise between efficiency and precision [6],

[7]. The asymmetric particle filtering process can significantly increase the accessibility precision of hierarchical clustering by estimating the target location of the hierarchical clustering in the hybrid database as figure 1 shows.

The best option is the block-chain. Due to the dispersed variety of the Internet, researchers combine blockchain technologies with the key elements of cross-domain authentication techniques, such as distributing, consensus techniques, peer to peer (P2P) and encrypting strategies [8].



**Figure 1:** E-commerce Network Process

Power systems, sensors, robots, detectors, automation personnel and equipment, movement sensors, cameras, and wearable tools are key components of farm management. Monitoring data is crucial for improving the performance and efficiency of all components. The ability of nature to predict the production output that enables better production distribution [9].

We develop a re-examination mechanism in a classified learning process to address the imbalance between high-credible user and common user training data. In real-world datasets, we conduct extensive experiments. Experimental results demonstrated the efficiency and progress of our approach.

## 2. REVIEW OF LITERATURE

The reputation management of many fields, e-commerce, multi-agent, peer-to-peer and social media platforms, has been studied. Reputation superintendence can help companies in selecting a confident and appropriate collaborator so that the likelihood of future defective transactions can be minimized. The provider's reputation is given to freshly installed utilities in the proposed framework. The writers evaluated provider credibility based on previous experience. The system, on the other hand, is unable to cope

with the fact that the provider is a beginner during the credibility assessment phase.

In [10], authors presented the stereotype concept based on partners' observable characteristics and behaviors. Then, the unknown partners were evaluated with these stereotypes. This is suitable for multi-agent dynamic framework and reliant on agent coordination. The idea of the modest reputation utilitarian was launched for the first time in combination with theory of game to assure the reputation curtailment and resolve the reputation bootstrapping problem.

Group of researchers [11], using model regression, incorporated QoS attributes along identical service reputation utilities to predict newcomer's service reputation worth. A reputation bootstrapping approach in which artificial neural networks acquire associations between QoS and reputation of established services before generalizing them to assess the reputation of new and unknown services. Nevertheless, the above literature does not discuss the determination of relevant credibility factors affecting the core of the issue and the analysis of their inner relations.

In [12], the product review network and user behavior features were combined, and spammers were detected using MRF. A bipartite diagram was constructed and a modified MRF was proposed for spammers named "Fraud Eagle." The main inconvenience of network-based analytical techniques is the need to update the entire model every time a new node is added.

The authors of [13] introduced agriculture paper based on blockchain IoT which is proposed to help farmers to make transactions easier by using an intelligent transaction instead of just a separate token. Farmers will be able to make accurate decisions in the future due to the preservation of IoT sensor information in a Blockchain. The hardware consists of a Raspberry Pi with IoT sensors, Ethereum running in the background, HTML, and JS angular front. The locking and confirmation of intelligent contracts on both sides release ethers which eliminate intermediate involvement.

In [14], Sensitizes the sustainable green IoT and its important function in diminishing emissions, as well as the role of green nanotechnology in achieving acute, organic farming and renewable energy harvesting. Different energy demand and power demand reduction methodologies are being researched. The authors used the greenhouse concept, which included IoT concepts, embedded systems to automate it. The greenhouse environment model is automated along the assistance of Enduing 3, which has many connected detecting sensor devices.

### 3. PROPOSED METHODOLOGY

In terms of temperatures, humidity, and other sensors, a robotics-based sustainable agriculture system is seen as an IoT system committed to monitoring the process of the adjacent agriculture details. This device implements the 'plug and sense' principle, allowing producers to introduce advanced farming by installing the arrangement on the farm and easily sharing live and in actual environments data about variables such as their cell phone and the data produced by the sensors with agriculture professionals using Google Firebase technology [15].

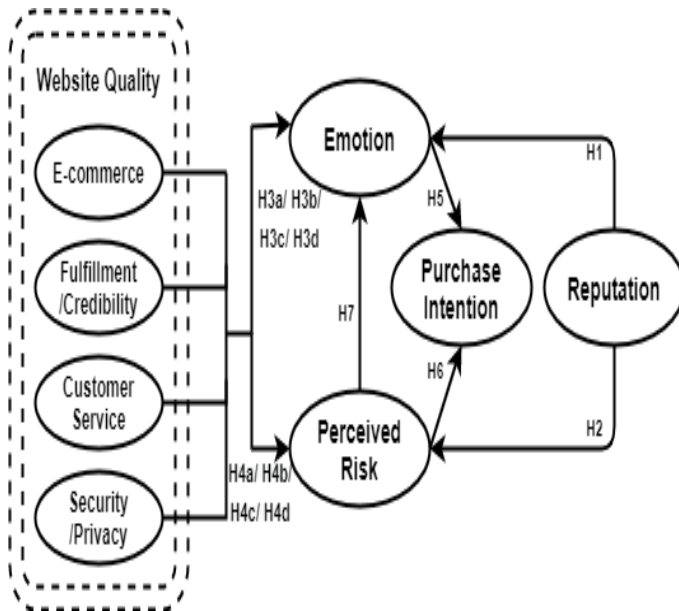


Figure 2: The Sample Credibility Modelling

Figure 2 shows that the embedded platform's integrity is not secured, and that the logic of platform execution can be changed, as well as the execution of sensitive data such as trojans or viruses. Computer ter technology that is trusted and has unique features is commonly used. Its first feature is safety. This can only happen if people are permitted and certified on a trustworthy computer platform. Nobody can normally operate without certification [11], [13], [15].

Trusted computing technology is a modern kind of information network privacy technology. The safety chip framework is incorporated into the mobile device hardware framework in Android mobile smart devices so that protection and stability of Android interfaces can boost the opening of Android devices.

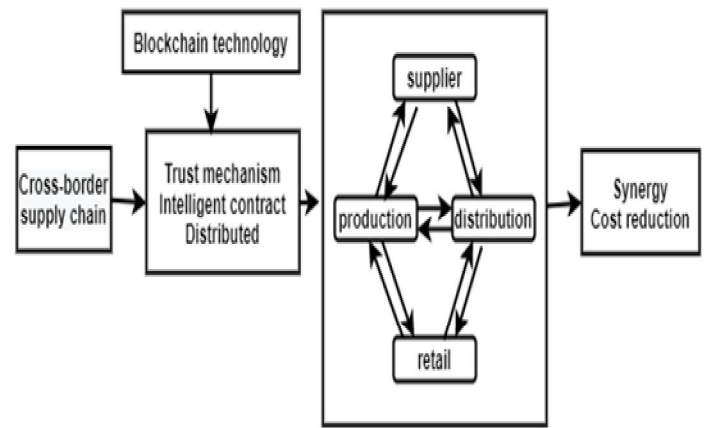


Figure 3: Structure under Blockchain Technology

Figure 3 shows the productivity and worth of the transboundary logistics network is improved, and the operations costs are reduced, and the efficient movement of goods is of special importance. Smart warehouses play an extremely important role in business logistics management as part of the across the board logistics system. In particular, inventory management, commodity scheduling and cooperative business play a great role, particularly in overseas warehouses, borders, overseas post offices, secured stores, and other business logistics modes.

#### 3.1 Working Principle

Machines and algorithms assess transaction trust, and therefore all respondents do not require to create assurance relationships; instead, they must assert their legitimacy using cryptography standards and consensus algorithms. The trading process removes all human interventions and enables the Parties to automatically perform the agreement as per trading circumstances through a smart contract created by the system. Trading actions and data can be engaged in by multiple parties, registered by various parties, recorded by different parties, and managed together using distributed storage, which could only be read and written and cannot be corrupted with.

**Step 1:** Establish a Linux test environment. The verification node's plan of the network environment indicates that the docker is used to install a virtual machine test environment.

**Step 2:** Create a network for testing. Install several dockers on several personal computers to communicate among dockers and extend the network size to carry several verification nodes. Multiple dockers can be mounted on a single PC.

**Step 3:** Consider the Consensus module, Source code analysis. Analyze the convenient Byzantine IPBF source code

for popular code writing standardized way to discover the corresponding event framework.

**Step 4:** Search for the consensus interface function; track all parameters and related consensus algorithm functions in the framework by following the consensus case process function. Find the consensus algorithm interface function.

### 3.2 Proposed Algorithm

The blockchain converts the multi-agent transaction rules of the e-commerce system into acute compact cipher, documentation the protocol and process repute along with blockchain, and implements the blockchain cipher of the project. The intelligent contractual can be promptly concluded the monitoring and transferring of funds ensures not only that the transaction is authentic, trusted and compulsory; it also ensures that the transaction is evidence-based and significantly improves the reliability of the e-commerce multi-agent approach.

#### Improved Practical Byzantine IPBF

Input: Message signature  $x+p$  Message number  $h$

Begin

$(x+p, n) \longrightarrow$  Leader

Leader  $\longrightarrow$  (Verificationn)( $x+p, n$ )

Leader copied to follower.

Leader > Verify from follower.

If leader is bad

Leader Candidate

Follower Candidate

Voting > (follower) New leader

End

We have so far extracted three sets of features to measure a user's credibility, i.e. user activity features, user reliability and text quality features. All functions have been built into a 9-component vector. Each vector component is equivalent to one function. Samples are all represented as vectors in training and test sets, which are considered as the input of model classification. We test the performance of three different classificatory, including SVM and Random Forest, in our experiments (RF). Be aware that the number of users of low credibility is generally considerably higher than the number of users of high credibility. They can cause a disruption of the training data in both categories and thus affect the performance of the evaluation of user credibility. We use a resampling mechanism in a classifier's education process to tackle this problem.

## 4. RESULTS AND DISCUSSION

This outcome is because our model takes into account all credibility variables (vendors, customers, platforms, and external influences) before exploring the CSFs with QoS factors. According to the comparison outcomes, our

suggested model has smaller MAE and RMSE values and better accuracy than other approaches. According to the figure 4 and 5, the QoS and REM approaches are very reliable for the maximum number of vendors in the training data, but have a significant estimation variability for the remaining retailers.

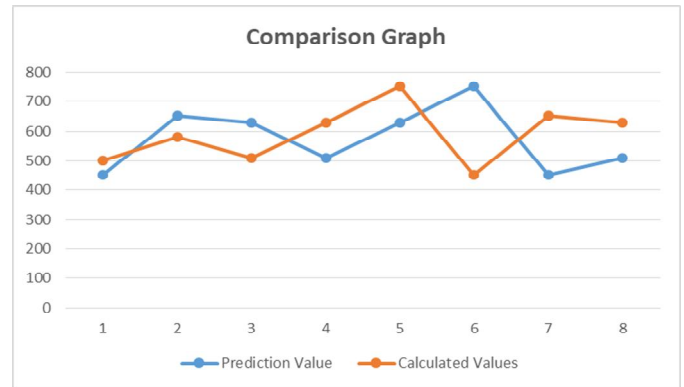


Figure 4: Comparison Graph

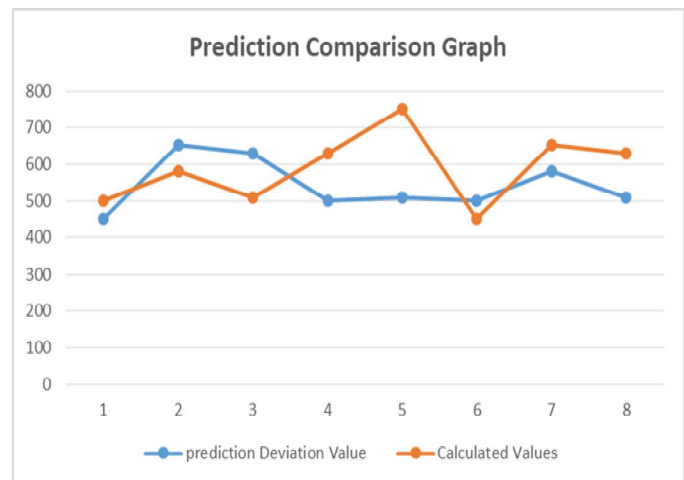


Figure 5: Prediction Comparison Graph

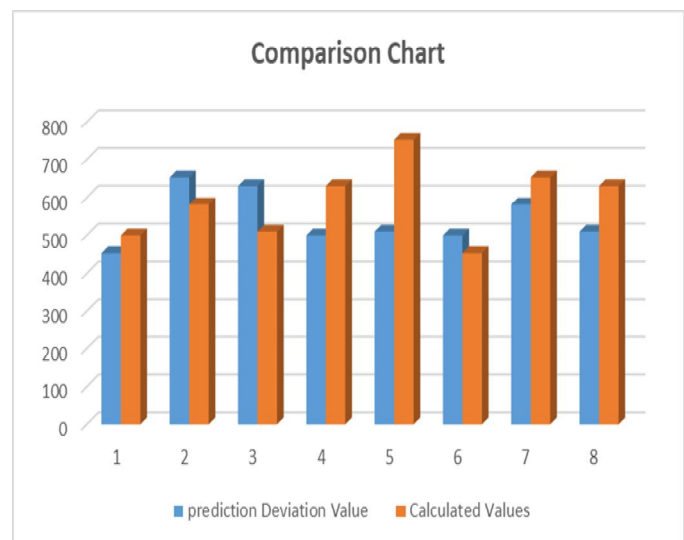


Figure 6: Comparison Chart

Figure 6 shows that the experiment's aim is to validate the viability of our presented model and to establish its effectiveness and precision in estimating the reputations of fresh sellers. In this framework assessment, we weigh up the predicted reputation utilities and the measured reputation utilities via response ranking in the testing data. To equate the output of our model to other models, root mean squared error (RMSE) and mean absolute error (MAE) metrics are used by us. Particularly, the comparisons are carried out in the same environments.

**Table 1:** Comparison of MAE and RMSE

Comparison of MAE and RMSE			
Metrics	IPBF	QoS	REM
MAE	0.1691	0.0717	0.0511
RMSE	0.1904	0.0812	0.0598

The Merkle Trees data model is used to store data in the blockchain. Binary Merkle Trees are perhaps the most effective and common type of Merkle tree. Table 1 shows that all data blocks in the Merkle tree hash-based data structure are classified in two categories, and these frames of data are the nodes with in the tree. The hash pointer leading to each frame of data is preserved with in the upper layer's parent node, and the hash pointers of these referring nodes are clustered by two again. Loop till we have a lone block of data, the Merkle Root. Eventually, Hash of the Merkle Root is computed using the algorithm of Merkle Tree and retained in the Block Header as a description of the transaction list. Table 2 shows the levels of entrepreneur.

**Table 2:** Levels of Entrepreneur

First Level	Second Level	Third Level
“Character category” entrepreneurship’s course	“Skill category” entrepreneurship’s course	“Synthesizing category” entrepreneurship’s course
<ul style="list-style-type: none"> <li>• Introduction to Innovation and Entrepreneurship</li> <li>• Entrepreneurial psychology</li> <li>• Entrepreneurship law</li> </ul>	<ul style="list-style-type: none"> <li>• Network image processing and animation</li> <li>• New media marketing</li> <li>• E-commerce website construction and maintenance</li> </ul>	<ul style="list-style-type: none"> <li>• E-commerce innovation and entrepreneurship practice</li> <li>• C2C e-commerce entrepreneurs</li> </ul>

**5. CONCLUSION**

The above literature review, data analysis, and graphical chart more perceptually demonstrate that there is a cross, convergence of multiple systems in the domain of e-commerce and business intelligence. To summarize, our

findings will help future researchers to better investigate the frontier domains in relevant areas, direct the development of e-commerce and enterprise analytics, and recognize technological change and sustainable growth. Obtain a general understanding of the current study methodology, subject fields, and innovation growth, as well as a better understanding of the growth of similar industries and upcoming trends.

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