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Cross Border E-Commerce Uses Blockchain Technology to Solve Payment Risks

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Abstract: The exponential expansion of addressing payment risks through E-Commerce Apps is mostly attributable to technical developments in this area. Although the blockchain was first created to support Bitcoin, its potential applications outside that digital currency are currently being explored. The adoption of blockchain technology may reduce the time it takes to complete a transaction, provide a more secure platform, and eliminate payment risk. Before this change, businesses were forced to go outside their borders for a satisfactory answer to the problem of payment risks. Blockchain technology has allowed us to overcome this obstacle. DTA-KNN is used as a cross-border model in this study. To do this, KNN is used to analyse data from neighbouring nations, and DTA is used to choose the most appropriate international payment gateway. To evaluate the efficacy of the suggested model, it is put up against well-established algorithms like DTA and KNN. The findings demonstrate that the hybrid model is more accurate than the other two separately.

Keywords: DTA, E-Commerce,Hybrid DTA-KNN algorithm, Cross-Border, K-Nearest Neighbor (KNN).

I. Introduction

E-commerce's level of adoption and integration with the physical economy makes it the most promising path toward the disruption of the status quo for the conventional business model. The food service, fashion, and other service sectors have all made strides in the new e-commerce mode as the idea of market consumption has been gradually opened up [1]. Postal bank transfers exemplified the oldest semi-automated type of payment; internet banking differentiated manual mode from payment; and the researcher's electronic wallet exemplified the most recent kind. The convenience of making payments online is always evolving and bettering. Presently, e-wallets serve a wide variety of purposes. There seems to be a never-ending flood of new internet services, such as online investing, online bill paying, online payment, and online financing. It is reasonable to anticipate that the online payment tool will evolve into a full-featured personal financial service platform in the near future. The term "cross-border e-commerce" is used to describe an international business activity in which subjects of a transaction from different customs territories engage in a transaction via an e-commerce platform, complete the transaction with electronic settlement and payment, deliver the goods via cross-border e-commerce logistics and remote storage [2]. The growth of international online business is a direct result of the internet. Because of its global and decentralized nature, the network may be thought of as a media entity without borders. Therefore, the features of globalization and decentralization may be seen in the international e-commerce that is embedded in the network.

The researchers formulate a comprehensive, all-encompassing definition of e-commerce [3]. Essentially, it is the use of information and data processing technologies to commercial and mercantile contexts in order to address issues with the flow of information. It shows the evolution of a company's production procedure in all its aspects, such as the allocation of resources, the introduction of cutting-edge production technologies, and the virtualization of management. The researchers propose a knowledge management approach to the issue at hand, which entails formalizing the process of turning data collected from numerous sources into actionable intelligence by building networks of knowledgeable individuals. There was a unanimous agreement that the foundation of e-commerce is electronic knowledge, both the practice and the infrastructure for managing information [4]. The study state that e-organizations may benefit from a knowledge-oriented e-commerce viewpoint since it allows for knowledge-based e-commerce. In order to build an analytical model, the authors of this paper delved into the literature surrounding block chain finance and looked at how it may be used to

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improve the security of cross-border e-commerce transactions [5].

Cross border ecommerce:

China's cross-border e-commerce has benefited greatly from the country's recent fast expansion of domestic e-commerce and the steady refinement of its business model, which have propelled China to the forefront of global e-commerce. As a result, it is crucial to establish a system for international online trade that is both stable and fair [6]. In contrast, the current e-commerce architecture, particularly the centralized e-commerce model, is unable to support the long-term growth of cross-border e-commerce. There are significant obstacles, particularly in the areas of accountability, coordination, finances, and legal agreements. Coincidentally, there has been great alarm in the academic community about the advent of digital currencies like bitcoin, and particularly the Blockchain technology on which bitcoin depends [7]. Considered another disruptive revolution in technology after the Internet, blockchain is making its way into sectors as diverse as international e-commerce, financial networks, IoT, and more. The Internet economy is now dominated by application-driven innovation, but its tremendous growth momentum is predicted to usher in a shift toward innovation that is driven by technologies [8].

To put it simply, cross-border e-commerce is a kind of economic activity in which customers and sellers from different countries use an online marketplace to negotiate terms of a transaction, make financial arrangements, and arrange for the shipment of items across international borders. Recent years have seen sluggish product circulation due to the gradual flattening of the growth rate of the global economy and commerce. Fixing this issue will need ongoing efforts to quicken the flow of commodities, expand access to foreign markets, and boost economic and commercial development. More and more businesses are cutting down on travel time to international customers in order to boost commodities sales. Exporting cross-border e-commerce is necessary in the current economic climate, and it is still expanding fast, with ripple effects on the global economy. Cross-border e-commerce has substantially facilitated international trade by lowering transaction costs, streamlining the transaction process, increasing the velocity of money flow, and opening up new markets throughout the globe [9].

Credit ratings for international online transactions are not standardised because of economic, social, and cultural variances across countries. Since there is currently no international, open enterprise credit-sharing platform, companies from different countries cannot accurately assess the creditworthiness of each other when conducting cross-border transactions, leading to unfavourable selection outcomes and slowing the growth of cross-border e-commerce [10]. Although the concept of traceability in logistics is now a reality, its implementation in cross-border e-commerce has been less than successful. For instance, the Middle East is a world leader in oil production, while Europe is a powerhouse in manufacturing and Asia is a powerhouse in the food and agricultural industries. Because of informational disparities between the nations doing the importing and the exporting, adverse selection is a common phenomenon in the trade of such goods [11]. Moreover, some domestic criminal enterprises convert local phony and poor products into foreign products by forging logistical information. These not only undermine consumers' most basic rights but also slow the growth of international online trade and may even spark wars between countries.

Cross border e-commerce in payment process:

Current cross-border payment methods generally cannot achieve real-time arrival, and the risk of exchange rate fluctuation due to the enterprise's foreign exchange exposure during the payment process is exacerbated by the rapid change of exchange rates, both of which are problems for cross-border e-commerce because of the different countries involved and their varying foreign exchange control policies [12]. In addition, the majority of today's international online purchases are made via a dedicated platform, and the corresponding records of such purchases are likewise kept in a digital location. The present framework for international online trade means that the international payment platform cannot effectively limit international online trade. In addition, effective supervision of cross-border payment is complicated by the global lack of uniformity in financial rules and regulations. Due to the absence of oversight, enterprise self-discipline has to be implemented, which inevitably raises credit risk and transaction costs for businesses. Cross-border e-commerce is more difficult to navigate than domestic e-commerce because of the inherent intricacy of trading between countries. Therefore, businesses engaging in cross-border e-commerce not only face the challenges of cross-border logistics, currency rate, and other unknown variables, but also face the additional time and money costs associated with multiple intermediaries [13].

Blockchain was initially defined in 2008 by the same researcher who invented Bitcoin as a decentralized electronic currency system. The authors remark that the majority of the technologies described in the article predate the publication by decades, but that it was only via a new combination of these technologies that the double-spending issue, where the same digital asset is spent more than once, was solved [14]. Particularly noteworthy is the researcher's

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1983 proposal of a "blind signature" approach for an anonymous payment system (in which the content of a message is masked before being signed). Even so, there was a need for a governing body to keep an eye on things to make sure everything was running well. While blockchain and similar technologies were widely debated in computer science and cryptography academic circles after Bitcoin's first release, they failed to have any discernible effect on the larger economy, industry, or public awareness. This is evocative of the ARPANET, a TCP/IP-based packet switching network established at the end of the 1960s and used primarily by academic and military groups to exchange data and communicate, from which the Internet sprang [15]. There was a significant increase in public awareness of blockchain in 2015, when the Bitcoin price began to rise and more media focused on practitioners and explicitly detailed the potential economic implications of the technology. Several writers have constructed frameworks that demarcate between different levels of analysis and proposed blockchain-based research agendas for a wide range of fields, including governance, supply chain management, and the sharing economy [16]. The industry's quick adoption of blockchain led to inflated expectations during the euphoria, but interest in investigating blockchain's potential for commercial applications has persisted. IBM, Maersk, Carrefour, and Walmart, to name a few, are all investigating the potential of blockchain technology to improve supply chain solutions by increasing visibility, speeding up processing, and doing away with paperwork in an industry plagued by fraud and massive inefficiencies [17]. Amazon has just submitted a patent application for an authenticator built on the blockchain, which would be used to confirm the legitimacy of products purchased by customers. To further the development of blockchain technology, Overstock.com established a subsidiary called Medici Ventures. In particular, they want to make it easier for individuals to deal with one another without the need for a central clearinghouse or bank. Dubai hopes to employ blockchain technology to boost governmental efficiency, encourage the growth of new companies, and establish itself as a worldwide leader, all of which will help it achieve its vision of being the "happiest city on earth." Project Dubai CommerCity is expected to cost about $870 million [18]. As a result, they anticipate the retail and online commerce sectors to have the fastest growth of any sector. The COVID-19 epidemic has contributed to this trend by increasing the use of bitcoin payments in the midst of the crisis.

Recent studies show that despite blockchain's potential significance for the future of e-commerce, this area of study has received very little attention thus far. Purchasing, selling, and advertising through the World Wide Web is a concise definition of electronic commerce (also known as "e-commerce"). The term "e-commerce" refers to transactions conducted via electronic systems such as the Internet [19]. As block chain technologies continue to develop, they may have significant implications for businesses and consumers alike. This brings up several problems associated with e-commerce in many industries. Such applications include blockchain's potential impacts, virtual assets, the development of new academic specialties, and the introduction of groundbreaking technologies [21]. As blockchain technology may facilitate the transmission of valuable virtual assets as digital information between peers, it has the potential to influence numerous intra- and inter-organizational operations relevant to e-commerce [22].

II. Literature Review

Distributed ledger, consensus mechanism, asymmetric encryption, smart contracts, and tokens are just a few of the blockchain's features that can reduce transaction costs, improve consumer and merchant trust, and solve problems like false payments and consumer data leakage that are prevalent in today's cross-border E-Commerce payment systems. This report examined two payment methods using blockchain technology based on current research, including digital cash payments and the use of third-party payment platforms. Following that, the paper by LIAO Qian et al. (2021) examined the mechanism of blockchain in cross-border e-commerce payment platforms and offered an innovative blockchain cross-border e-commerce payment platform, which can be used as a guide for the future of blockchain technology in international trade[23].

Additionally evolving and changing is cross-border trade. Modern cross-border e-commerce now relies primarily on electronic payments. Although businesses and daily life have benefited from electronic payments' efficiency and ease, there are still several issues with the security of transactional information. These issues not only impede the advancement of electronic payments but also pose concealed risks to the safety of people's property. As a result, a suggested e-commerce encryption algorithm's security and risk management mode were further investigated using case analysis, empirical analysis, and comparison analysis [24]. Experimental data demonstrate the innovation of blockchain technology. In order to bring the new e-payment mode in line with worldwide standards, Tung-Chun Chen et al study 's from 2021 aims to explore its applicability in particular situations.

Various document recording and authorisation procedures are time-consuming in the existing cross-border electronic commerce (e-commerce) system, and record sharing

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effectiveness is low. Identity verification is also challenging. It is suggested to use asymmetric encryption technology that combines cryptography and blockchain technology. The benefits of asymmetric encrypted communications include high security and simplicity of multiparty communication collaboration, application to a peer-to-peer network created by blockchain technology, and making cross-border e-commerce record cross-domain sharing traceable, data immutable, and identity verification easier. First, file synchronization contracts and authorisation contracts are created using asymmetric encryption technology and Blockchain technology's immutable modification. The benefits of dispersed storage ensure that cross-border e-commerce user data is kept private. Second, without the aid of a third-party notary institution, unauthorized users can be safely filtered thanks to the design of the cross-domain acquisition contract, which successfully verifies the identity and data-sharing efficiency of both sides. The findings of the simulation experiment demonstrate that the solution suggested in this work by Zhao Hongmei (2021) has clear advantages over conventional cloud computing approaches in terms of data antitheft, multiparty authentication, and reducing system overhead [25]. It offers a guide for how to use the decentralization and auditability of Blockchain to solve security issues in the data sharing process. It also offers ideas for how to address issues with data sharing and cross-domain authentication.

When used to e-commerce, blockchain-based technologies have the potential to drastically alter many existing business applications and operations. In light of the fact that blockchain and related technologies can create so-called "trustless systems" with idiosyncratic properties, the various business models and established procedures that have evolved over time to ensure trust, reliability, and enforceability in B2C, B2B, B2G, and C2C relations need to be questioned and, if necessary, revised. Blockchain technology has the ability to radically alter the e-commerce landscape by facilitating decentralised, centrally authorised, and trustless trade linkages. Giving everyone in the supply chain access to immutable data has the potential to drastically impact the flow of data and the value exchanged between companies and customers. In this publication, Horst Treiblmaier et al. (2021) provides a framework and 19 high-level research topics to encourage more study into blockchain's possible impact on electronic commerce. The four main types of problems may be broken down into four subcategories: technological, legal, organizational, and consumer. In this study, we explore the potential impact of blockchain technology on many aspects of online commerce in these contexts[26].

In addition to addressing some of the problems with established industries, blockchain, a new technology with decentralization, immutability, and traceability, encourages the transition of business models and reshapes trust. The size of cross-border payments is growing at the moment. Traditional cross-border trade has a number of drawbacks, though, and new technology developments are desperately needed. Cross-border payments and blockchain technology are a natural fit, and the former can address the latter. This paper by Deng, Qing (2020) analyzes the application modes and benefits of cross-border payment based on blockchain technology, then further proposes the application of blockchain technology to cross-border payment constraints based on a summary of the cross-border payment models and their drawbacks [27].

Banks have been talking a lot about "distributed ledger blockchain" as the blockchain technology has been in the news for a while. Many banks and financial institutions have established innovation laboratories to carry out proof of concept experiments so they may take advantage of current technology centered around "blockchain" and "distributed ledger." Industry studies have shown that the two major elements believed to lead to internal opposition to blockchain adoption are regulatory and compliance difficulties, and these must be properly addressed. An effort has been made to address this pain point from the standpoint of introducing an additional DATA Layer along the payment process chain via the blockchain. The regulatory and compliance requirements around the transaction details for proper transaction monitoring or validating the originator and beneficiary details for FATF or "sanction screening" can be properly implemented using the DATA Layer. Transparency inside the network would reduce the number of suspicious transactions for AML and the transactions through "high risk countries." Additionally, it has been suggested that the easiest way to get started is to take baby steps and start using Blockchain for intra-group payments first [28]. The implementation would instantly assist banks and other financial institutions with the costs associated with the creation and processing of messages like MT202, MT199, MT999, etc. Given the daily quantities, it would be a step toward cost savings, a quicker turnaround, and an opportunity to profit from blockchain and distributed ledger technology. Additionally, because the focus is on intra-group transfers, banks will feel more secure because they are aware of the limits of the payments.

A blockchain-based theoretical framework for cross-border e-commerce ecosystems is proposed in the paper of Xiang-Dong Shen et al., published in 2020. The ecosystem consists of five systems: a cross-border logistics system, a cross-border payment system, a cross-border system for tracking

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the quality of products, and a cross-border system for monitoring customs. Through past research and expert interviews on cross-border e-commerce, this study first determined the key improvement criteria for the new ecosystem built on blockchain [29]. The usage of blockchain's fundamental features, such as decentralization, anti-counterfeiting traceability, consensus mechanisms, smart contracts, and others, were then investigated in order to remove the obstacle preventing the development of cross-border e-commerce between Korea, China, and Japan. Finally, useful implications that can be seen from both theoretical and practical angles were given. As a result, this study suggests a blockchain-based solution to the issues with cross-border e-commerce among Korea, China, and Japan. Based on this, it creates an ecosystem for cross-border e-commerce between these three nations that consists of five systems. The fundamental issues with the current blockchain are also covered, including the poor transaction concurrency, security flaws, and inconsistent standards. Corresponding solutions are suggested at the technological, security, and industry standards levels.

Globally, cross-border transactions are becoming more and more common. However, there are still risks and difficulties associated with the current cross-border transactions, such as disparities in regulation policies and imbalanced bank profits. We build a new framework for the transaction system with the aid of blockchain technology in order to address this important problem. To secure the execution of cross-border transactions, Z Fu (2021) suggest a new consortium blockchain technology, dubbed asymmetric consortium blockchain (ACB), in this study [30]. The new blockchain system could support the supernode to timely control all transactions, in contrast to traditional consortium blockchains. The new smart contract is also intended to increase fairness in the profits allocation scheme and decrease opportunity loss for each node. Finally, the transactions from Shenzhen and Hong Kong were used as the basis for the numerical experiments. The findings demonstrate the effectiveness of the proposed ACB system in improving participant fairness in profit distribution while maintaining intelligence for the new cross-border transaction system.

III. Materials and Method

Cross-Border ecommerce payment risks is occurred in all part of the financial system. This plays an important role in the development of the financial perspectives of any nation. It will also aid in the growth of the country in the international export system. The challenging task in this payment process is identifying the right gateway over the country.

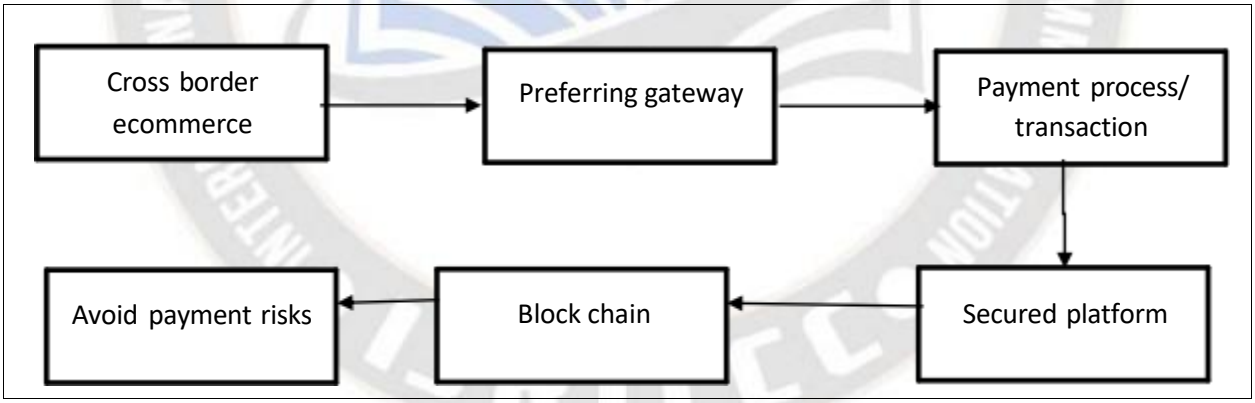

Figure 1: Architecture of the Proposed Cross-Border ecommerce payment process

To overcome this challenge an intelligent system is designed to identify the payment platform which are on huge demand across the globe and increase the productivity on the ecommerce. The data is collected through the blockchain technology and the intelligent system will perform the analysis of the requirement. This will aid in the effective selection of the payment gateway by the new clients and these processes are represented in Figure 1.

Hackers can compromise the mobile payment system due to security flaws in mobile networks, and customers can lose money if they do not properly save their user ID, account password, and smartphone.

Payment risks

False payments can be mitigated through technological techniques, but they cannot be eliminated. It is possible that neither party in the transaction knows the other's identity or credit standing. The lack of familiarity with local customs among international customers raises the stakes, particularly in cross-border transactions. Given the international nature

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of the commerce, the fact that each country has its own set of laws and regulations governing online payments, and often tiny amounts involved in mobile payments, any problems that may arise will be difficult to overcome.

Regulation risk

Existing laws governing mobile payments are insufficient to support the industry's rapid growth. Mobile payments are not completely covered by commercial banking laws and regulations. To completely safeguard customer rights, most third-party payment processors fall short. When consumers suffer losses due to security flaws in products, they are in no position of strength because they lack the tools to ensure their possessions are safe and to assign blame where it belongs.

Credit risks

There is a connection between the growth of international trade and each country's credit system. Financial intermediaries in different nations cannot collaborate on a system for sharing data on the creditworthiness of international transactions. Credit risks in cross-border mobile payment can affect both customers and financial organisations engaged in international trade and payments. Cross-border financial institutions are vulnerable to platform flaws that could be exploited by hackers or cause network infections or other issues. Moreover, a degree of credit risk may also be included.

Possible loss of money

A lack of ability on the part of banks to authenticate cross-border transactions may make it simple for criminals to make fraudulent withdrawals using techniques like false pricing reporting and online payment followed by cash withdrawals. It can be challenging for merchants and payment processors to verify the identities of their international customers and their financial standing, as well as to tell whether the money they are dealing with is dirty, or to trace its whereabouts in a timely manner, when conducting business across borders. It might be used in illegal activities. Criminals can commit money laundering and other forms of fraud by taking advantage of the network's virtual space.

Hybrid DTA-KNN:

In this research a hybrid of Decision Tree Algorithm (DTA) with K-Nearest Neighbor is proposed. According to DTA, is implemented to split the results based on the specific parameter. Later to this selection, the services are provided based on either the managing services or metric prediction. In any given country the demand for the product may vary from another country. If any new country is seeking to meet the demand, then they will try to seek the support from K-Nearest countries for support or guidance. According to the suggestion received, the new country will analyze the price for placing the order. Once the prices are finalized, the order will be finalized to the organization of the other country. The organization will make a self-analysis about the expenses and arrange the logistics for exporting the ordered product. With these processes, it can be seen that the hybrid of Decision Tree Algorithm (DTA) with K-Nearest Neighbor (KNN) is termed as DTA-KNN is implemented in this research.

In this proposed work, artificial intelligence based on knowledge representation to selecting the e-commerce products.

Let us consider two attributes P (e-commerce payment risk) and Q (characteristic of payment risk) and also P divided into α subclasses $P_1, P_2, \dots, P_\alpha$ and Q divided into β subclasses $Q_1, Q_2, \dots, Q_\beta$. Then this classification can be form in the $\alpha \times \beta$ contingency table. By using X^2 to the test of independent attributes: Under the null hypothesis H_0 the attributes of P and Q are independent. Then the expected frequency of α^{th} e-commerce product and β^{th} characteristic of the product as in the Equation (1).

$$e_t(P_\alpha\, Q_\beta) = \frac{(P_\alpha)(Q_\beta)}{T_{\alpha+\beta}} \quad (1)$$

In general, for all $\theta = 1,2, \dots, \alpha$ and $\eta = 1,2, \dots, \beta$ defined as in the Equation (2).

$$e_t(P_\theta\, Q_\eta) = \frac{(P_\theta)(Q_\eta)}{T_{\theta+\eta}} \quad (2)$$

where the attributes of P_α is the (row) sum of the observed frequency of the α^{th} e-commerce product and $Q_1, Q_2, \dots, Q_\beta$ characteristic of the e-commerce products. That is represented in the Equation (3)

$$(P_\alpha) = ob(P_\alpha\, Q_1) + ob(P_\alpha\, Q_2) + \cdots + ob(P_\alpha Q_\beta). \quad (3)$$

In general, for all $\theta = 1,2, \dots, \alpha$ and is given in Equation (4).

$$(P_\theta) = ob(P_\theta\, Q_1) + ob(P_\theta\, Q_2) + \cdots + ob(P_\theta Q_\beta). \quad (4)$$

Also the attributes of Q_β is the (column) sum of the observed frequency of the β^{th} characteristic of e-commerce product and $P_1, P_2, \dots, P_\alpha$ characteristic e-commerce products as in the following Equation (5).

$$(Q_\beta) = ob(P_1\, Q_\beta) + ob(P_2\, Q_\beta) + \cdots + ob(P_\alpha Q_\beta). \quad (5)$$

In general, for all $\eta = 1,2, \dots, \beta$ Equation (5) is modified as in Equation (6).

$$(Q_\eta) = ob(P_1\, Q_\eta) + ob(P_2\, Q_\eta) + \cdots + ob(P_\alpha Q_\eta). \quad (6)$$

In Equation (1) and Equation (2), the variable $T_{\alpha+\beta}$ is the row sum of the attributes of the e-commerce products $(P_1), (P_2), \dots, (P_\alpha)$ and also which is equal to the column sum of the attributes of the characteristic of e-commerce

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products $(Q_1), (Q_2), \dots, (Q_\beta)$. That is represented as in Equation (7).

$$(P_1), (P_2), \dots, (P_\alpha) = T_{\theta+\eta} = (Q_1), (Q_2), \dots, (Q_\beta). \quad (7)$$

$$X^2 = \sum_{\theta=1}^{\alpha}\sum_{\eta=1}^{\beta}\left[\frac{[ob(P_\theta Q_\eta) - e_t(P_\theta\, Q_\eta)]^2}{e_t(P_\theta\, Q_\eta)}\right| \quad (8)$$

In Equation (8), the X^2 variate with $(\alpha - 1)(\beta - 1)$ degrees of freedom and it can be tested at any required level of significance for $(\alpha - 1)(\beta - 1)$ degrees of freedom at 5% level of significance. In the blockchain, we used to find the detail of the customer to select our e-commerece products in a pariticular area and KNN algoritham used to find the nearest neighbours. Then the definition can be represented as in Equation (9).

$$L_{e\text{-}com} = \{(ec_t, b_t), t = 1,2, \dots, n\} \quad (9)$$

In Equation (9), $L_{e\text{-}com}$ is the training set of select the t^{th} customer e-commerce products and the sensor ec_t [in $(1, 2, \dots, \delta)$] is the membership of that class and the vector $b_t^l = (b_{i1}, \dots, b_{ip})$ represents the predictor values. Using sensor node the distance function d_f, to determine the nearest neighbours. Then the sensor (e_c, b) (in $L_{e\text{-}com}$) is the nearest neighbour of the sensor (ec_1, b_1) and its determined by the Equation (10).

$$d_f(b, b_1) = \min_i\{(b, b_i)\} \quad (10)$$

and $\hat{b} = b_1$, the class of the neighbour, is selected as prediction for b and also (ec_q, b_q) is the q^{th} nearest neighbour of b. Then the Euclidean distance as in the Equation (11).

$$d_f(b_t, b_q) = \left|\sum_{y=1}^{p}(b_{ty} - b_{qy})^2\right|^{1/2} \quad (11)$$

Then the absolute distance is caculated using Equation (12).

$$d_f(b_t, b_q) = \sum_{y=1}^{p}|b_{ty} - b_{qy}| \quad (12)$$

The Equation (11) and Equation (12), in the special cases of the Minkowski distance as follows:

$$d_f(b_t, b_q) = \left|\sum_{y=1}^{p}|b_{ty} - b_{qy}|^x\right|^{1/x} \quad (13)$$

In Equation (13), we get the aboslute distance if $x = 1$.

IV. Results and Discussion

The data collected in this research is a trans-national dataset, which contains all the transactions that are made in a year. The transactions are China-based and registered ecommerce, which mainly sells unique products. Many customers of the company are wholesalers. Figure 2 explains the number of payment failures occurred in year 2021. This figure depicts month wise data of payment failures occurred in cross border ecommerce during year 2021.

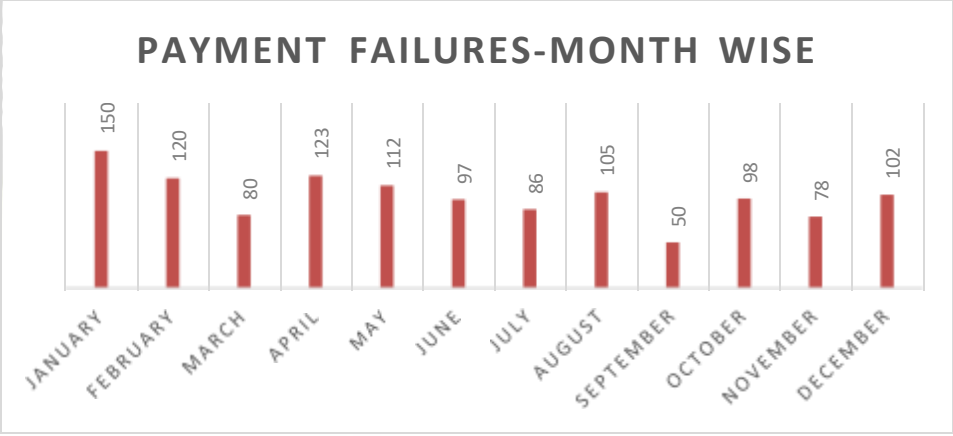

Figure 2: Number of payment failures

It is observed from the Figure 2 that the ecommerce faced high number of failures in the month of January in the considered year. The month of May have obtained 112 which is 38 less than the January month. Among this, the largest number of cross-border e-commerce payment failures was during the January month month and the least number of sales was during the September month. This graph shows that the sales was in its peak during the mid of the year and it gradually decreased through the end of the year. From this, we can say that, e-commerce sales are mostly done at the middle of the year with intelligent analysis of the collected data.

Table 1 explains about the total quantity of products exported in the specified duration along the average price of the products is presented. As the sales increases, the risks of payment method also increases in ecommerce.

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Table 1: Analysis based on Unit Price (in Millions)

Starting Range	Ending Range	Total Quantity Sold
0	99.99	494749
100	199.99	458
200	299.99	194
300	399.99	44
400	499.99	41
500	599.99	34
600	699.99	8
700	799.99	17
800	899.99	25
900	999.99	13
1000	40000	95

Table 2: Scoring table of satisfaction level

strongly dissatisfied	1
moderately dissatisfied	2
slightly dissatisfied	3
no preference for existing risk	4
moderately satisfied	5
very satisfied	6

Table 2 denotes the scoring table of satisfaction. By using these scores, they can validate their risks.

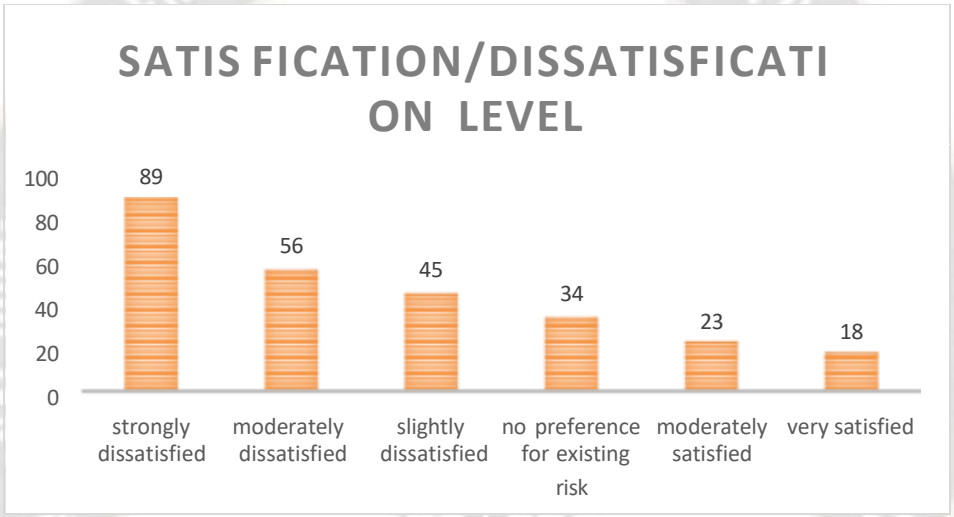

Figure 3: Satisfaction and dissatisfaction

Figure 3 depicts the satisfaction and dissatisfaction amount of customers with the risks. From this figure, it can be observed that 89% of the customers are completelty dissatisfied with the risks. It is significant to analyse what type of risks they are facing with.

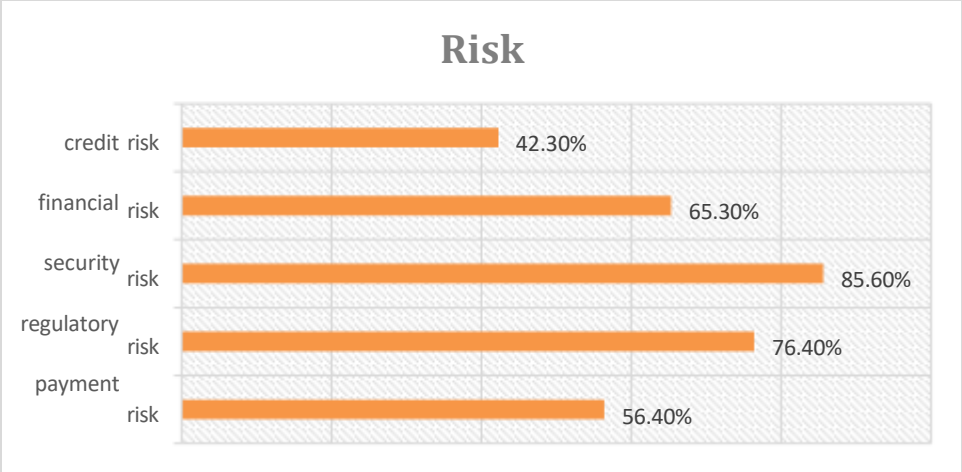

Figure 4: Risk types

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This study analyses the dangers of international mobile payments by grouping them into five categories: consumer risks (making mistakes during the checkout process), merchant risks (not trusting the store, not getting a refund), third-party payment platform risks (money lanudering), security risks (security and privacy issues) and regulatory risks (whether relevant laws, regulations, and oversight are in place or not). From figure 4, we can observe that most people experience security risk during their transactions.

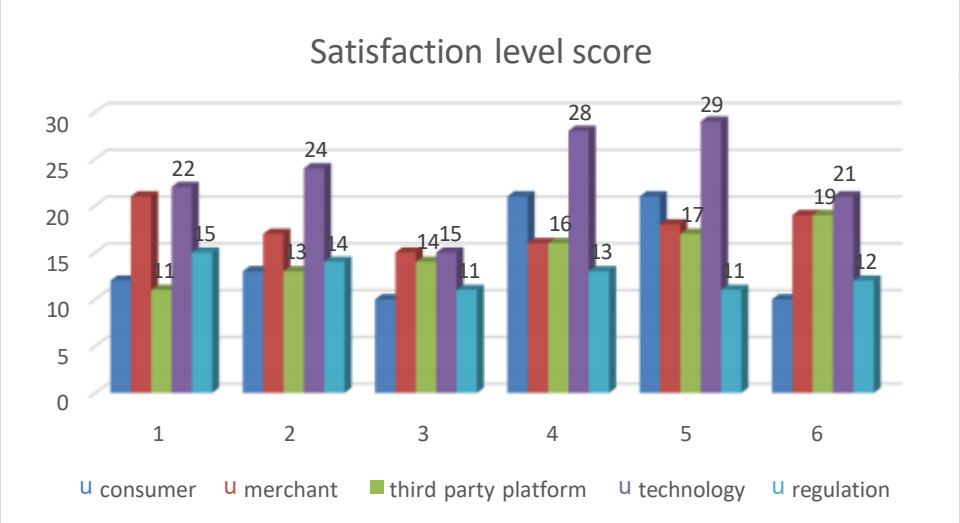

Figure 5 Satisfaction

From figure 5, we can observe that technology risk has the highest impact whereas regulation has the lowest impact. Due to lack of technology, the payment failures and risks have been occurred. Merchant risk is also need to be considered while making payment or at the time of transaction.

Table 3: Satisfaction level score

score level	consumer	merchant	third party platform	technology	regulation
1	12	21	11	22	15
2	13	17	13	24	14
3	10	15	14	15	11
4	21	16	16	28	13
5	21	18	17	29	11
6	10	19	19	21	12

As we observed in Table 3, the technology risks is one of the main thing noticed in cross border ecommerce. The implementation of blockchain reduces the payment risks as well as technology risks.

Blockchain is set to play a significant role in increasing transaction security. As the need for international money transfers grows, so does the possibility of theft of assets or private data. The ability of blockchain to detect anomalous patterns of behaviour across a payments network allows for the rapid identification of fraudulent conduct. With the aid of blockchain, banks and other financial institutions can protect their clients' money and personal information from fraud. From a safety standpoint, blockchain is also useful for AML checks. Banks and other financial institutions are working on automated transaction verification tools, which will eliminate human mistake and speed up the processing time of financial transactions by eliminating the need for manual checks.

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Table 4: Performance Analysis with the Proposed Hybrid Model

Algorithms	**Accuracy in Analysing the data and Product Delivery**
Decision Tree Algorithm (DTA)	96.2%
K-Nearest Neighbour (KNN)	94.5%
Hybrid Decision Tree Algorithm with K-Nearest Neighbour (DTA-KNN)	99.2%

For accuracy analysis in the data analysis, allocating resources, scheduling the product transportation and so on over the two existing models such as DTA and KNN were used with the proposed DTA-KNN model. From the results depicted in the Table 4, it is seen that the proposed DTA-KNN algorithm have achieved a higher accuracy of 99.98% which is greater than the existing algorithms.

V. Conclusion

Although blockchain-based mobile payment is a major driver of the rapid development of cross-border trade in the world today, there is currently no well-defined worldwide structure to coordinate the risk issues faced by governments during cross-border transactions. Important measures that can be taken to clean up the worldwide web and prevent international fraud and phone transactions include collecting user data before a cross-border payment is made and implementing a real-name system. In order to stop sensitive data from leaking out, payment-processing systems need to be made more secure, and the internet ecosystem needs to be improved so that everyone can use it with confidence. If you notice any problems with a foreign payment, you must inform the platform immediately. Payment verification and technical risks can be reduced by using digital signatures, fingerprint payments, face scanning verification, and iris verification in international mobile transactions. When compared to domestic expansion, going global brings particular difficulties for third-party payment institutions. It is urgent that the international community update the relevant laws and institute some internationally accepted regulatory structures and norms for international mobile payment.

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