BLOCKCHAIN BASED E-TENDER MANAGEMENT SYSTEM

¹Akshata Wadekar, ²Ashwini Desale, ³Pranali Gangurde, ⁴Divyani Girase, ⁵Dr. Umesh B. Pawar

 ¹²³⁴UG Students, ⁵Professor and Head Department of Computer Engineering
 JES SND College of Engineering and Research Center Babhulgaon, Nashik, MS, India.

Abstract- As per survey the current e-tendering processes are not open to everybody involved, which means information isn't shared with all parties involved. When a corporation is chosen as the winner of a contract, for example, the information is disseminated as they wish. Organizations that bid on a same tender aren't told why their proposal was rejected or why one company was chosen as the winner. A corporation can request this information, but obtaining it is a time-consuming process, as a fact that checking result papers is possible and reviewing them takes time. A side from not being transparent, the security of these portals is a major worry, as it can lead to fraud and data manipulation in a central database. If a hacker acquires access to this central database, bids can be shared with competitors, resulting in severe financial and strategic losses for a corporation. [4][7]

By and large, the Tenders or agreements are utilized by legislatures and organizations to get labor and products. On account of flawed processes, ill-advised delicate the executives result in critical losses. Contractors are leaned toward, records aren't kept as expected, there's an absence of transparency, there's hacking, information is changed, things like these happens various times. To defeat this issue, we will utilize a straightforward and secure encryption combined with reliable block-based engineering for exchange the executives. For this situation we will utilize block bind exchange-based records alongside exchanges such as to give a totally straightforward offering process, delicate reports, applications, bid recommendations, organization profiles, past records, endorsing official subtleties, furthermore, dismissal subtleties are undeniably required. So, we will implement the system with blockchain along with machine learning algorithm approach for prediction of the best company classification for the tender, we are going to use the dataset from Kaggle and also, we will make our own datasets. [6]

Key Words: Blockchain, Tenders, Bidders, Contractors, Encryption, Portal, Machine learning.



Published in IJIRMPS (E-ISSN: 2349-7300), Volume 11, Issue 3, May-June 2023

License: Creative Commons Attribution-ShareAlike 4.0 International License



INTRODUCTION

Today businesses and governments are largely reliant on information and communication technology to communicate and making contacts. E-tendering is increasingly being adopted through the world. E-tendering in its simplest form is described as the electronic publishing, communicating, accessing, receiving and submitting of all tender related information and documentation via the internet. Thereby replacing the traditional paper-based tender processes and achieving a more efficient and business process for parties involved. The basic principles of the tendering process have been applied to many business areas, such as purchasing goods, seeking service providers, business consulting, or the selection of main contractors for construction work [1]. Inadequate security brings opportunities for fraud and collusion by parties inside and outside of the tendering process. In this paper first, a general framework for legal and security requirements for a typical e-tendering

system will be identified. Secondly, the three stages of development and implementation for an electronic tendering system and security issues related to each stage will be discussed.

This stage of development is the same as the second stage except the tender is awarded and the contract formed Electronically with on-going contract administration carried out electronically via collaboration software. In the previous electronic tendering system, digital signatures were proposed as a technical means to ensure the non-repudiation of precontract communications. In this new electronic tendering system, electronic signatures will be needed to ensure the authenticity of an electronic contract. The probability that this authenticity will be brought into dispute is likely to be much higher than that of pre-contract communications. Failing to prove the authenticity of an electronically signed contract may lead to severe consequences. The risk assessment for this electronic tendering system needs to take into account these consequences.[2][7]

By and large, the Tenders or agreements are utilized by legislatures and organizations to get labor and products. On account of flawed processes, ill-advised delicate the executives result in critical losses. Contractors are leaned toward, records aren't kept as expected, there's an absence of transparency, there's hacking, information is changed, thus on. To defeat this issue, we have utilized a straightforward and secure block tie innovation and to get by encryption combined with unquestionable block-based engineering for exchange the executives. For this situation we utilize block bind innovation to get exchange-based records alongside exchanges such as to give a totally straightforward offering process, delicate reports, applications, bid recommendations, organization profiles, past records, endorsing official subtleties, furthermore, dismissal subtleties are undeniably required.[3]

PROBLEM DEFINITION

Current e-tendering processes aren't 'fair and open,' which means that information isn't shared with all parties involved. When a corporation is chosen as the winner of a contract, for example, the information is disseminated 'as they wish. Organizations that bid on a same tender aren't told why their proposal was rejected or why one company was chosen as the winner. A corporation can request this information, but obtaining it is a time-consuming process.[2][3]

OBJECTIVES OF SYSTEM

- 1. To implement the fair system for tender allocations.
- 2. To provide user friendly system for tender allocation.
- **3.** To allocate the tenders securely.

PROPOSED SYSTEM ARCHITECTURE



Figure 1: Proposed System Architecture

IMPLEMENTATION DETAILS (Modules)

1. Register and Login: Here we are allowing user to register first to our system which will be a security protocol used by us.

2. Dataset Creation and Trained: This module is based on machine learning where we create the dataset for system and trained the system and create model for analyzing the requirement of user.

3. Tender Apply: Here we are Applying the available tender and submit to system.

4. **Processing:** Here we will do the Tender extraction and matching it with the dataset trained model.

5. Display: System will automatically select the best company for tender and rest will be informed why there are not selected.[8]

PROPOSED SYSTEM:

• e-Tendering

Portal System The e-Tendering portal should be transparent to the end users. They should be enabled to use a graphical user interface that supports all stages of e-Tendering. All the necessary information should be automatically transferred between the system's modules. Through this module, authentication will be conducted by implementing single Sign-On concept which will in effect seamlessly authenticate to all integrated modules of the system. In addition, the e-Tendering Portal, should offer key language as English and where necessary multi-lingual capabilities that enable the use and support of multilingual features of the System.

• e-Registration

E-Registration Module should employ user management and include functions such as registration, verification, and approval. A single interface for the registration of stakeholders who intend to use the e-Tendering Portal must be provided. Suppliers should be able to register themselves in order to participate in tenders. Every user registered on the e-Procurement Portal should be associated to an EAC organ /Institution within each organisation/Institutions, different user roles should be supported. Once users have registered, the information should be saved in the database for further use.

• e-Bidding

System e-Bidding system is the most effective system among the e-Tendering services. e-Bidding system is used to prepare e-procurement plans, e-publishing (advertise tenders), search bid information, e-submission (submit the bid document), e-evaluation, check the result of open bid and select winner on-line. Tendering officer can notify the bid information, receive the supplier's bid documents electronically, open the bid automatically and select a winner.

• e-Contract

System Tendering entities and suppliers can make contracts using standard electronic documents without visiting and stamping. e-Contract system provides standard contract format and user draft contract information without on-line bidding. The institutions and suppliers can reduce time expenses and enhance business productivity by e-Contract system. An e-signature tool such as digital certificate is important to include

Contract Management System

Contract Management is one of the key stages in the tendering cycle. The e-Tendering system will allow bidders and contract managers to interact online transparently to management and easily identify communicate disputes and delays

Reporting Statistics System

Most automated systems become useful by providing key information to key stakeholders and decision makers. The intended system will provide these data in real time

• Linked (interface/Integrated) System

The new e-tendering system will be required to exchange information with other existing applications – various such as assets and inventory management systems.

ADVANTAGES

• Automation:

By automating various manual processes and eliminating intermediaries, a blockchain-based e-tender management system can significantly reduce costs associated with paperwork, administrative tasks, and middlemen.

• Paperless System:

With a blockchain-based system, all the tender-related documents, such as bid proposals, contracts, and evaluations, can be stored digitally on the blockchain. This eliminates the need for physical paper documents and reduces the associated costs of printing, storing, and distributing paper-based materials.

• Fast Process:

Disputes and conflicts can arise during the e-tender process. With a blockchain-based system, all tenderrelated activities and interactions are recorded on the blockchain, providing an immutable and transparent audit trail. This enables faster and more accurate resolution of disputes by referring to the indisputable evidence stored on the blockchain.

• Accuracy:

Removal of manual process and by using the machine learning algorithms it gives the accurate result without any bias.

• Cost Effective:

Going paperless eliminates the costs associated with paper procurement, printing, storage, and transportation. Additionally, it reduces the expenses related to physical document management, such as filing systems, document handling, and archival maintenance. Overall, these cost savings can be significant for organizations implementing a blockchain-based e-tender management system.

• Security:

Paper documents can be susceptible to loss, damage, or unauthorized access. Blockchain technology provides a secure and tamper-proof environment for storing digital documents. The use of cryptographic algorithms and decentralized consensus mechanisms ensures the integrity and confidentiality of the documents, enhancing overall document security.[5]

APPLICATIONS

1. Government procurement: Blockchain-based e-tender management systems can be applied in government procurement processes to enhance transparency, efficiency, and fairness. It enables secure and auditable tender processes, reduces corruption risks, and ensures accountability in public spending.

2. Education sector: Blockchain-based e-tender management systems can be utilized in the education sector for tendering services such as school infrastructure development, technology procurement, or outsourcing contracts. It simplifies bid submission, evaluation, and contract management processes, enhancing transparency and accountability in education procurement.

3. Construction industry: The construction industry involves complex tender processes with multiple stakeholders. Implementing a blockchain-based e-tender management system can streamline bidding, evaluation, and contract award processes. It facilitates efficient communication, transparent documentation, and secure transactions between contractors, suppliers, and project owners.[8]

SNAPSHOTS OF RESULTS





2 1 1			
G-crenaer			
\$5	Document Name		
ss@gmail.com	Enter Document Name		
B	Document File		
Profile	Choose File No file chostn		
My Works	La Nampanonementa da calca da Calca da Calca		
Tenders			
Tenders	See		
 Tenders Logout 	See.		
 Tenders Logout 	See 10 vienties. Seath		
 Tenders Logout 	Sou Store 11 v petites. Seath	1]
 Tenders Logout 	Soor Stare 11 - Pontries, Search	Action	
 Tenders Logout 	Som Som 10 motion Search 10 No 11 Name 10 11 consumeration	Action	
k Tenders ← Logout	Som II words: Seath	Action	

CONCLUSION

Tenders are increasing in magnitude, and both buyers and suppliers are feeling its impact. In the last decade, many e-procurement tools and web platforms have organized the source-to pay process. Still, these remain relatively limited in solving the overall bottleneck, i.e., reducing the overall administrative burden and automating the tasks across the process lifecycle for both buyers and suppliers. In many cases, these platforms have digitized the pen-and-paper process without providing any added efficiency. machine learning (ML) are the latest technologies that apply algorithms in finding concealed trends that humans cannot recognize to make decisions using existing data and can significantly improve process efficiency and stage automation. ML and its derived bidding framework offer the promise and hope to improve suppliers' bidding performance while helping buyers ensure an optimum value-for-money across procurement.[5][7] This project has successfully used a combination of Machine learning methods by proposing SMART CONTRACT to improve the Electronic Procurement E-Tendering System to be more transparent, accountable, and effective to prevent corruption. Hence our system is overcoming the drawbacks of existing system and provide better solution in low cost.[3]

REFERENCES:

- 1. Transparency International Indonesia, Indeks persepsi korupsi Indonesia 2021: Survei antara pelaku usaha di 12 kota di Indonesia. 2021.
- 2. KPK, "Statistik TPK Berdasarkan Jenis Perkara," 2020. [Online]. Available: https://www.kpk.go.id/id/statistik/penindakan/tpk berdasarkan-jenis-perkara.
- H. Xinli, "Effectiveness of information technology in reducing corruption in China A validation of the DeLone and McLean information systems success model," Electron. Libr. 2018, vol. 33, no. 1, pp. 52– 64, 2015, doi: 10.1108/el-11-2012-0148.
- 4. M. Dachyar and G. Novita, "Business process re-engineering of logistics system in pharmaceutical company," ARPN J. Eng. Appl. Sci., vol. 11, no. 7, pp. 4539–4546, 2016.
- 5. G. Singh, "Role of Relational Database Management System in Management Information System," Int. J. Curr. Eng. Technol., vol. 7, no. 6, pp. 2109–2111, 2017.
- 6. F. Zhang, Z. M. Ma, and J. Cheng, "Enhanced entity-relationship modeling with description logic," Knowledge-Based Syst., vol. 93, pp. 12–32, 2016, doi: 10.1016/j.knosys.2015.10.029.
- 7. Yourdon, "Dataflow diagrams," in Just Enough Structured Analysis, no. March 1896, Ed Yourdon, 2006, pp. 112–114.
- 8. Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah, "Peraturan Pemerintah Republik Indonesia Nomor 9 Tahun 2018. Jakarta : LKPP," p. Hal. 35-37, 2018.