

Blockchain Based e-Tendering System

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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.

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.

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

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. 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 pre-contract 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.

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.

1. PURPOSE

As per survey the current e-tendering processes are not open to everybody 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.

EXISTING SYSTEM

As per the survey e-offering processes aren't 'absurd and open,' and that implies that data isn't imparted to all gatherings included. At the point when an organization is picked as the victor of an agreement, for instance, the data is spread 'as they wish. Associations

that bid on an equivalent delicate aren't explained why their proposition was dismissed or why one organization was picked as the victor. An organization can demand this data, however getting it is a tedious cycle. Notwithstanding the way that actually taking a look at these papers is conceivable, surveying them takes time. A side from not being straightforward, the security of these entrances is a significant concern, as it can prompt extortion and information control in a focal data set. 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.

OBJECTIVE OF SYSTEM

- To implement the fair system for tender allocations.
- To provide user friendly system for tender allocation.
- To allocate the tenders securely.
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LITERATURE SURVEY:

“Advancing the e-tendering information system to counter corruption by proposing anti-corruption smart tools” a paper of Putri Mirah Delima. A paper state that the number of corruptions can reduce by corruption prevention initiative. This research aims to improve the e-tendering electronic procurement system (EPS) to be more transparent, accountable, and effective in preventing corruption and support the corruption eradication commission (CEC). Management information system and business process reengineering methods are used in this study. The information system design proposed in this research made with a structured system development method consists of 4 stages; the creation of entity-relationship diagrams (ERD), relational database, use case diagram, and dataflow diagram (DFD). This research provides three choices of scenarios that are modeled and simulated by igrafx software. The most realistic scenario to be implemented right now is the first scenario with database integration for government agencies' administrative documents. The first scenario's benefit is reducing average cycle time by 34.20%, faster bid evaluation process, and eliminating face-to-face processes to prevent collusion. Scenario 3 is the ideal scenario to be implemented in a long-term project. The third scenario's benefit is reducing average cycle time by 18.34%, a faster bid evaluation process, eliminating face-to-face processes to prevent collusion, strengthening e-tendering supervision with self-monitoring, analysis, reporting technology (smart), and increase information transparency.

“E-tendering tendering process within construction: AUK perspective” is paper of authors Geoff Tindsley, Paul Stephenson. This paper presents E-tendering can be defined as the issue and receipt of tender documentation through electronic means which facilitates the procurement of construction work and the award of contracts. The current paper-based method of tendering has been commonplace within the industry for a significant number of years, but with recent technological advancements, this traditional process is rapidly becoming outdated. Several major projects within the UK are now being procured through the e-tendering process which includes the multibillion-pound development for the Olympic Games in London 2012. However, while these prestigious projects are embracing e-tendering technology, it is not certain as to what extent e-tendering is used across the construction sector generally. This research is primarily concerned with establishing the current status, practicalities and resource effectiveness of e-tendering within UK construction. Results are provided from an industry survey which includes both quantitative and qualitative data. A case study implementation is also included which assesses the utilisation of e-tendering software in practice. The research findings indicated that e-tendering can provide substantial resource savings to a major part of the supply chain, with the key benefits being enhanced communication, time savings and reduced costs. However, a considerable proportion of the industry remains uncertain about embracing new technologies, with reluctance to change being perceived as the greatest barrier. The findings suggest that many professionals within the UK construction industry recognize a requirement for increased implementation of e-tendering, but feel that training, education and support from senior management are essential requirements for e-tendering to become widely accepted in the future.

“Advancing the E-Tendering information system to counter corruption by proposing anti-corruption smart tools” is a paper of M. Dachyar, this paper explains that the quantity surveyor, in summation of the tender process, responded. “Looking back, it probably took longer to carry out than if we had sent it traditionally in the post. However, we are now comfortable with the software and in a better position the next time we use it, drawing on the experience we have gained. If we, did it again, I am confident it could be done a lot more efficiently”. This statement highlights the significance of overcoming the initial challenges and skepticism associated with the first use of new technologies. This project has shown that resistance to change is still the largest barrier to widespread implementation of tendering. The tendering contractors were extremely hesitant about tendering in this format. The lack of training and understanding could have proved costly to the contractors' tender submissions. With reference to the parties involved in this project, it appears that the future use of e-tendering is dependent upon the optimism and open-mindedness of the companies involved. Once an organization has been involved with one tendering project, it is likely that they will do so again in the future.

“A new E-Tendering model for fully automated tendering process” is paper of Abdallah Qusef. This paper states that, along with the revolution in information technology solutions and the wide replacement of the legacy manual procedures with the automated and digital workflow procedures, many electronic solutions have been developed and used to digitize the supply chain processes and as one of the main processes in the supply chain, it is highly demanded nowadays to perform the procurement processes in the enterprises using e-procurement system. As part of e-procurement, this paper emphasizes the importance of leveraging the tendering process in an enterprise to be fully electronic by adopting the e-tendering approach. This research proposes a new model for e-tendering which enables an enterprise to conduct a fully automated web-based tendering process. The proposed model is a new conceptual model of fully automated, digital and web-based tendering solution that is covering all steps of the tendering process and involving all related departmental computer system modules and stakeholders. It also proposes a new mechanism for bidders' engagement into the e-tendering system which results in full digital cycle for complete tendering process as this is one of the main challenges in e-tendering solutions which is still lagging behind the digital environment and being done via paperwork and entered manually in

almost all tendering systems that are available nowadays. The model can be considered as a base for building a new framework for the development of an applicable e-tendering system that is fully automating the tendering process in any enterprise's tendering management system.

SYSTEM ARCHITECTURE

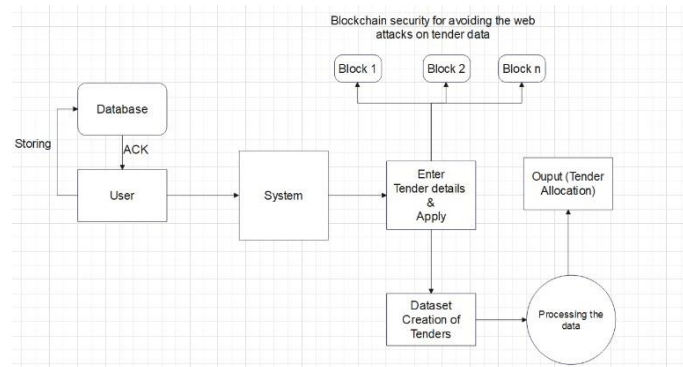


Fig -1: System Architecture Diagram

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.

PROPOSED SYSTEM:

The main and basic goal of our application is to allocate the tender with the fair allocation which is secured by the use of the blockchain of hashed values.

The system consists of the bidders and tenders. The tender authority will generate the tender. The bidders which are registered on the application can apply for the tender within the proposed tender regulations. The bidders will fill the informatory data on the tender about the given tender. Based on the best suited bidder which will provide the efficient working proposal will get selected as the winner within the all the bidders.

In the system we are using machine learning algorithm for prediction of best bidder classification, here we will use Support Vector Machine (SVM) Algorithm for the prediction purpose and we are going to use the various datasets over the internet and also making own datasets, to enhance the accuracy of the system the model will be trained properly.

Blockchain is based on the concept of decentralization. Hence, it can be viewed as a distributed database. In this case, the distributed database employs the concept of full replication, which means that each node has a full copy of a blockchain. Whenever the blockchain needs to be updated because of a transaction, a process called mining takes place. A block consists of many transactions. A consensus protocol is used and the mined block is broadcasted to all other nodes. These blocks will have a cryptographic hash in the header that relates to the previous block in the chain. If a block is manipulated the hash associated with this block changes and as a result, all the proceeding locks should be re-mined which is not possible. In this way, blockchain makes use of the immutability attribute. We will use SHA-256 cryptographic algorithm to encrypt confidential contents.

ADVANTAGES:

- To improving efficiency and widening the bandwidth, E-tendering helps businesses lower their procurement overhead as time moves forward, leading to increased savings.
- This is a reliable e-tendering system will guarantee financial stability when implementing a solid procurement process.

APPLICATION

- Government
- Organization
- Company

ALGORITHM/TECHNOLOGY

SVM

Support Vector Machine (SVM) is a supervised machine learning algorithm used for both classification and regression. Though we say regression problems as well its best suited for classification. The objective of SVM algorithm is to find a hyperplane in an N-dimensional space that distinctly classifies the data points.

Blockchain

A blockchain is a type of Digital Ledger Technology (DLT) that consists of growing list of records, called blocks, that are securely linked together using cryptography. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction

data (generally represented as aMerkle tree, where data nodes are represented by leaves). The timestamp proves that the transaction data existed when the block was created. Since each block contains information aboutthe block previous to it, they effectively form a chain (comparelinked list data structure), with each additional block linking to the ones before it. Consequently, blockchain transactions are irreversible in that, once they are recorded, the data in any givenblock cannot be altered retroactively without altering all subsequent blocks.

SYSTEM REQUIREMENTS

- **Software Used:**

1. Language: Python 3.4 or above
2. Windows: Windows 8 or above
3. IDE: Pycharm, Anaconda 2
4. Text Editor: Notepad++
5. Web Server: Xampp

- **Hardware Used:**

1. CPU: i3 or above
2. RAM : 4GB or above
3. Hard Disk : 80 GB or above

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 improveprocess efficiency and stage automation. ML and its derived bidding framework offer the promise and hope to improvesuppliers' bidding performance while helping buyers ensure ano optimum value-for-money across procurement.

This project has successfully used a combination of Machine learning methods by proposing SMART 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 a better solution in low cost as compare to existing system Hence, we are overcoming the drawback of exiting system and provide better solution in low cost.

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