

Leveraging Blockchain Technology to Enhance Transparency and Security in Engineering Project Bidding Systems

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Abstract: With the intensifying competition brought by economic globalization, the efficiency, fairness, and integrity of engineering project bidding systems have become critical factors influencing industry dynamics. Although electronic bidding platforms offer advantages such as enhanced transparency and reduced costs, they still face significant challenges, including fraud, illegal operations, information leakage, and limited data sharing. Blockchain technology, characterized by decentralization, immutability, transparency, and smart contracts, offers a promising solution to these issues. This study reviews the current state of engineering project bidding systems and analyzes how blockchain can address existing problems by enabling traceability, secure data sharing, and automated contract enforcement. Drawing on recent research, it proposes a blockchain-based bidding model that improves information reliability, ensures full-process supervision, and fosters trust among stakeholders. The findings suggest that integrating blockchain technology into bidding processes can fundamentally reshape project procurement practices, enhance governance, and promote the sustainable development of the engineering industry.

Keywords: Blockchain technology; engineering project bidding; transparency; information security; smart contracts; decentralized systems

1. Introduction

With the accelerating pace of economic globalization, the competitions in various industries are becoming increasingly fierce, among which the selection and application of the bidding mode of engineering projects plays an important role in the industry competition [1]. At present, the electronic bidding mode used in China has the advantages of higher transparency and lower cost, and can realize the efficient, fair, safe and low-cost bidding of engineering projects. However, it is not perfect, and the

technical support and other aspects need to be developed. There are still various illegal operations, fraud and other problems, as well as information security, leakage, sharing degree, which seriously affect the fairness and fairness of the project bidding activities [2].

As an emerging technology in the 21st century, blockchain technology has the characteristics of decentralization, tamper resistance, openness and transparency, and smart contracts. Its technological advantages are highly compatible with the problem solving in the implementation of engineering project bidding mode. Introducing it into the engineering project bidding mode for application has great advantages and can solve the current problems. Great potential will be unleashed in the reform and development of future engineering project bidding models [3]. The bidding process for engineering projects involves the game and collaboration of multiple stakeholders, and its business process is in line with the characteristics of blockchain. Therefore, the research on constructing a new bidding model for engineering projects based on blockchain technology has received increasing attention in recent years, but some of these issues still need further research.

2. Literature Review

Blockchain is characterized by decentralization, openness and transparency, tamper-proof mechanisms, encryption timestamps, and traceability, which can effectively address issues related to trust and consensus. It has gradually become a key technology for decentralized transactions and automated execution in finance [4], medicine [5], sports [6], agriculture [7], law [8], and other fields. With the successful application of blockchain technology in these domains, its potential application in engineering project bidding is expected to bring new development opportunities.

Meanwhile, with the rapid development of information technologies and intelligent modeling methods, scholars have increasingly explored data-driven and multi-scale analytical frameworks to enhance system reliability and risk identification. Relevant studies have proposed multi-scale deep learning and uncertainty estimation frameworks for anomaly detection in cloud environments [9], as well as graph neural network-based structural and temporal modeling methods for KPI time-series anomaly detection [10]. In addition, multi-level attention mechanisms and causal inference-based models have been introduced to improve decision accuracy and mitigate exposure bias in recommendation systems [11], [12]. In the medical domain, attention-based deep learning architectures have been applied to enhance segmentation performance and computational efficiency [13]. These studies indicate that advanced modeling techniques can effectively improve information transparency, system robustness, and process controllability, providing methodological references for the integration of blockchain and intelligent models in engineering project bidding.

The introduction of blockchain technology into the field of engineering project bidding has attracted extensive attention from scholars at home and abroad. Relevant studies have achieved openness, transparency, and traceability of the bidding process through blockchain integration [14], and have shown that blockchain adoption can significantly reduce communication costs [15]. Furthermore, blockchain-based bidding platforms have been found to facilitate privacy protection and public verifiability [16]. Other studies indicate that blockchain technology is expected to promote high-quality development and accelerate the transformation of engineering management [17], while also enhancing information processing capabilities and strengthening public trust in governmental supervision [18]. Moreover, blockchain has been shown to improve commitment enforcement, process transparency, and information security in project bidding processes [19].

From the existing literature, it can be observed that researchers have gradually recognized the importance of blockchain technology and intelligent modeling methods in engineering project bidding and have actively explored their application prospects. However, current problems in China's engineering project bidding system have not yet been comprehensively analyzed and effectively resolved through blockchain-based and data-driven approaches. Therefore, based on the perspectives of information flow and participant behavior, this study analyzes the deficiencies of the traditional bidding model. By examining the advantages of blockchain technology and intelligent analytical frameworks, targeted countermeasures are proposed to optimize the engineering project bidding process. The purpose is to provide systematic references for future research and practical applications, and to promote the standardized, transparent, and efficient completion of engineering project bidding activities.

3. Overview of the Blockchain Technology

In 2008, a research scholar named "Satoshi Nakamoto" published a foundation paper titled "Bitcoin: A Point-to-Point E-Cash System". The release of the Bitcoin White paper marked the generation of its underlying core technology--blockchain technology. Blockchain is divided into narrow blockchain and broad blockchain. The former refers to the chain data structure that combines data blocks in a certain way according to the time order and ensures data security. The latter refers to the new distributed infrastructure and computing paradigm of using blockchain data structure to test and store data, using consensus algorithm to generate and update data, using cryptography technology to ensure data transmission and sharing security, and using smart contract technology to program and process data. Its basic framework is composed of data layer, network layer, consensus layer, incentive layer, contract layer and application layer, as shown in Figure. 1 .

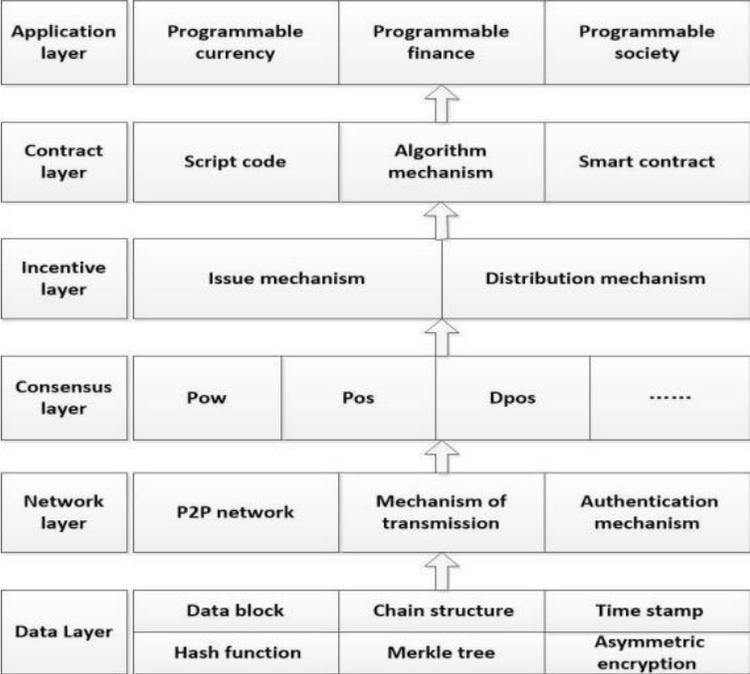


Figure. 1 Blockchain Foundation Framework

The development of blockchain technology mainly includes three stages, namely 1.0, 2.0 and 3.0. The 1.0 stage is mainly the application of digital currency, while the 2.0 stage is mainly the addition of the new technology of smart contract. At present, the blockchain 3.0 stage is programmable, and the emergence of blockchain technology will help the Internet to achieve from the transmission of information to the transmission of value. Blockchain technology has the characteristics of decentralization, openness, transparency and so on. By implementing decentralized features to prevent data from being tampered with, the problem of trust and consensus is solved. The feasibility of applying it to the bidding mode of engineering projects is precisely based on this characteristic.

4. Problems Existing in the Current Bidding Mode of Engineering Projects

The development of information technology and the popularization of the Internet have provided a good platform and foundation for the development of electronic engineering project bidding models in China. The electronic bidding model has the advantages of saving enterprise costs, facilitating supervision and management by regulatory agencies, and improving the overall bidding efficiency. Although the electronic bidding model has been widely used, there are some shortcomings in it. Below, the existing problems will be analyzed from the perspectives of information and participants.

4.1 From an Information Perspective

From this point of view, the main problems in the electronic bidding model are the issue of information security and information accuracy, the issue of low information utilization, and the issue of poor information storage capacity.

4.1.1 The Issue of Information Security and Information Accuracy

For the electronic bidding model, the technology of China's electronic bidding platform is not yet perfect. Although the information platform may set different permissions to ensure the confidentiality of information data during use, the confidentiality protection of information such as bidding documents uploaded to the information platform cannot be guaranteed. In order to win the bid, many unscrupulous enterprises may enter the bidding platform system by means of hacker technology, and maliciously tamper with or steal the bidding information in the system, resulting in issues of information security and accuracy. At the same time, due to the large number and wide range of personnel involved in the electronic bidding platform for engineering projects, there is a risk of account or password information leakage at any stage. Once leaked, it is easy for people to maliciously tamper with or steal information during the bidding process, which cannot guarantee the security and accuracy of the entire bidding process information, thereby affecting the normal progress of engineering project bidding.

4.1.2 The Issue of Low Information Utilization

At present, most regions in China have adopted the electronic bidding model, but in actual operation, most of them only utilize the platform's bidding information dissemination and publication function, without completely completing the entire engineering project bidding process through the electronic bidding platform. So, the information generated in the bidding process is unable to be shared and communicated with others, ultimately resulting in low utilization rate of the generated information and inability to fully utilize the original value of the information. This hinders the development and application of electronic bidding models.

On the other hand, due to the long-standing monopoly of engineering project bidding information resources and traditional confidentiality awareness, enterprises with information resources are subjectively unwilling to share information with other enterprises in the industry. The concept and awareness of information resource sharing have not yet formed. It is prone to the phenomenon of information silos, unable to achieve comprehensive interoperability, multi-party interaction, data sharing, resource disclosure and other functions, resulting in a low level of information and data sharing, a lack of unified standardized standards, and increasing the difficulty of participants in comprehensive and accurate analysis of information data in engineering project bidding. This leads to a low utilization rate of information generated in the bidding process of engineering projects, making it difficult to showcase the value of information.

4.1.3 The Issue of Poor Information Storage Capacity

With the improvement and improvement of the electronic bidding model, there are more and more engineering project bidding activities, and each engineering project bidding process will generate a lot of information, data, and other materials. These information and data need to be archived and preserved by the electronic bidding platform. Because the capacity of each bidding document is between 300-800MB, and the archives need to be kept for at least 15 years, the number of engineering project bidding archives accumulates over time, and the required storage capacity also increases. A large amount of data storage can lead to insufficient system storage capacity, ultimately seriously affecting the operational efficiency and stability of the electronic bidding platform.

4.2 From the Perspective of Participants

From this point of view, the main problems in the electronic bidding model are the issue of uneven levels of evaluation experts, the issue of being not familiar with computers of operators, and the issue of inadequate inspection of supervisory personnel.

4.2.1 The Issue of Uneven Levels of Evaluation Experts

In the bidding and evaluation process of engineering projects, it is difficult to ensure the fairness, scientificity, and objectivity of the evaluation process and results if the expert members of the evaluation committee have insufficient professional knowledge reserves and uneven levels, or if the experts of the evaluation committee lack independence. Due to the inadequate professional quality level of experts in the bid evaluation committee, they may sometimes score and evaluate based on their own subjective judgment or impression. When the bidding unit bribes the experts in the bid evaluation committee, it may affect the fairness of the bid evaluation results. At the same time, if the professional ethics level of experts in the bid evaluation committee is not high, they may be bribed by bidding personnel, have abnormal private dealings with bidding personnel, and are prone to collusion and cheating between bidders and experts in the bid evaluation committee, resulting in bid evaluation results that harm the interests of the project tenderer.

4.2.2 The Issue of Operators Being not Familiar with Computer

In the bidding and evaluation process of engineering projects, many evaluation committee experts are older and have limited knowledge of computer operation technology. At the same time, many personnel engaged in the bidding industry in China have transferred from traditional engineering cost, engineering management and other majors, and are not familiar with the professional operation knowledge of computer software. In the past decade, most major universities have trained single type

talents, and computer professionals are not familiar with the bidding process of engineering projects. Even worse, the salary and benefits of personnel working in the computer software industry are much higher than those engaged in engineering project bidding. Therefore, many people choose to work in the computer software industry, while few are willing to choose the job of engineering project bidding management.

Due to the current adoption of a new electronic bidding model in the bidding process of engineering projects, operators need to fill in and upload key information in the bidding documents according to the table format specified by the platform. Some bidding units may not provide detailed descriptions in the platform's operating guidelines or the operation process may be "cumbersome" during the filling process. Operators may not be familiar with the filling process during the filling process, which may result in a long filling time and even errors in the information filling in the bidding documents. Some unit staff are not yet proficient in the operation process of the electronic bidding platform. If errors are found and they want to make certain modifications to a certain content, the unit staff may be unable to modify the key information of the error due to unfamiliarity with the platform operation content. Therefore, if relevant operators are unable to proficiently master computer operations, it will ultimately seriously affect the bidding results.

4.2.3 The issue of Inadequate Inspection of Supervisory Personnels

The supervision mechanism of engineering project bidding has an important impact on the final bidding result. In the electronic bidding platform, it is necessary to complete the release of bidding documents, review of bidders' bidding qualifications, evaluation of bidders' bidding plans, formulation of the winning bidder, and final determination of the winning bidder. However, there is currently a lack of mature methods to complete these tasks, and the bidding process on this platform is prone to "dark box operations". In this mode, there is a lack of clear regulations on whether alternative bidding proposals and progress reports on the actual situation of bidding can be completed through the platform. At the same time, the written reporting channel for electronic bidding has not yet been opened, and there is a lack of clear operational steps and basis for how to implement it. These are all phenomena of weak supervision mechanisms in the electronic bidding mode.

The supervision information sources for engineering project bidding mainly include two types: one is the active filling of information by participants during the bidding process, another type is the various information collected by local public resource trading venues for bidding and tendering of engineering projects. Public resource trading venues all have their own independent bidding and trading system platforms. The main problem currently is that the information exchange and exchange between the public resource trading platform and the supervision platform under the electronic bidding mode of engineering projects are insufficient, mainly due to the lack of timely sharing. The two platforms cannot achieve timely communication, and cannot guarantee the accuracy of information submission. To a large extent, it restricts the supervision efficiency of the supervision platform and the accuracy of information extraction and inspection by the supervision department at any stage of the bidding process, resulting in inadequate supervision and inspection.

5. Analysis of the Advantages of Blockchain Technology in the Bidding Mode

5.1 Promoting Transparent Management and Full Process Supervision of Engineering Project Bidding Information Through Structural Decentralization

In the traditional bidding model, the release of bidding information for engineering projects is carried out uniformly by the release management center of the bidding enterprise. However, due to the consideration of local economic development by enterprises, the bidding information is often not fully released nationwide. Although the electronic bidding model solves the problem of limited scope of bidding information dissemination, there is an overly centralized problem in terms of information security and accuracy, as well as in the supervision of bidding activities. For engineering project bidding, the information involved is personally published by the bidding enterprise on the electronic bidding platform, and other participants can only understand relevant information through its publication channel. Some unscrupulous individuals are easily able to maliciously tamper with the information released by bidding companies through hacker means. At the same time, the supervision of engineering project bidding activities is carried out by relevant supervisory agencies that establish relevant supervision mechanisms. During the bidding process, other participating parties cannot participate in the supervision process, and the results of engineering project bidding may be controversial. The decentralized advantages of blockchain technology can effectively solve the above problems.

The essence of blockchain is a distributed structure composed of several highly autonomous nodes that are freely connected to each other in chronological and logical order. These nodes form their own system due to their independent functions and governance mechanisms. The decentralized advantage of blockchain structure can play a certain role in the bidding process of engineering projects, helping each participating entity in the bidding process achieve a point-to-point handover mechanism. Both parties can directly negotiate, implement, and supervise various matters, thus achieving the management of each task without relying on the bidding enterprise management center. Based on this advantage, blockchain technology can also enhance the information expansion function in the bidding process of engineering projects, making it possible to jointly build, share, and maintain information.

At the same time, the cryptographic encryption algorithm of blockchain technology will be deeply applied in the bidding mode of engineering projects, and the cost consumption data, business execution measures, and process supervision effect during the bidding process of engineering projects will be fully displayed to all participants in a partitioned and itemized visualization manner, achieving real-time and dynamic supervision from multiple parties. For the bidding party, these data can help them supervise the behavior of each participant. For bidders, these data can help them develop bidding plans that are more in line with engineering projects.

5.2 Breaking the "Data Island" and Violations of all Participants in Engineering Project Bidding Through Data Diversity and Openness

In the traditional bidding process of engineering projects, due to geographical and time constraints, bidding companies are unable to share bidding information related to the project simultaneously. Some illegal bidding companies collude with other companies in advance, resulting in illegal behaviors such as collusion and bidding, reducing the fairness and impartiality of the winning bid. Although the electronic bidding model has solved these problems in practical operation, many times it only utilizes the platform's bidding information dissemination and publication function, without completely completing the entire engineering project bidding process through the electronic network platform, resulting in other information generated in the bidding process being unable to be shared and communicated with others, ultimately resulting in low utilization of the generated information. The data diversity and openness advantage of blockchain technology can effectively solve these problems.

Essentially, blockchain is a public database with open, jointly utilized, and jointly supervised data. Therefore, in each stage of engineering project bidding, the data openness advantage of blockchain technology helps to achieve real-time transmission of information throughout the entire stage of engineering project bidding, sharing bidding data information across the network, joint supervision and management of various nodes, and deep mining of data information value, thereby formulating more suitable bidding plans for engineering projects, while ensuring the fairness and fairness of the final results, reducing the occurrence of various violations and laws during the bidding process.

5.3 Improving the Reliability of Engineering Project Bidding Information and Enterprise Qualification Examination Through Whole Process Encryption and Traceability

The traditional bidding model for engineering projects may generate a lot of information during the bidding process, and it may be necessary to refer to the information generated in previous stages at different stages. However, due to the shortcomings of the traditional bidding model, it may result in issues such as information leakage, tampering, or inability to access. Although the electronic bidding model can solve some of the above problems, it is still difficult for tendering enterprise to distinguish the authenticity of bidding companies' qualifications before the bidding starts, due to some illegal companies may falsify their qualifications. In addition, the electronic bidding model has the disadvantage of poor information storage. When too much information is generated during the bidding process, it becomes very difficult for the system to store this information, resulting in a decrease in the overall system operation speed. The full encryption and traceability advantages of blockchain technology can effectively solve these problems.

The full encryption operation of blockchain technology not only helps to trace the entire bidding process of engineering projects, but also promotes the generation of advantages such as structural decentralization and data diversity and openness. In the bidding process of engineering projects, its full encryption and traceability features have the following advantages. Firstly, the bidding party, bidders, evaluation experts, and other participating parties provide newly added block data information and ensure the authenticity and reliability of its data information source. Secondly, asymmetric encryption technology is used to encrypt the newly added block data information, and different levels of password protection are provided according to the temporal order, logical level, and confidentiality level of the data information to ensure the security of the data information. Thirdly, the alliance chain organization broadcasts the newly added block data information throughout the network, ensuring that all participants can access and review the data. After many nodes are confirmed, it can be recorded in the overall blockchain. Finally, each block in the blockchain is a complete and independent information block, which itself contains the input time, input information, and other contents of this information block. Based on this, the entire data of any block can be quickly accessed in chronological order, which is conducive to tracing and correcting problems in the bidding process of engineering projects.

5.4 Improving the Fairness and Efficiency of Engineering Project Bidding and Evaluation results Through Smart Contracts

In the electronic bidding mode, the evaluation relies on the evaluation experts. If the professional level of evaluation experts is not very high, there will be deviations when evaluating the proposals. Even if the respected experts may have the same problems as before for they are not very familiar with computer operations. The advantages of blockchain technology in smart contracts can effectively solve the above problems.

"Smart contracts are designed to facilitate the execution of contracts through computer protocols and users, so as to reduce accidents and reliance on third-party intermediaries." , pointed out by the computer scientist Nick Sabo. In the smart contract blockchain system, a computer protocol code can be prepared in advance according to the bidding rules of engineering projects, so that it must meet the conditions agreed upon by all participating parties in the bidding and reach a consensus; By triggering automatic execution conditions through specific transactions, the blockchain system will automatically execute code contracts based on rules previously agreed upon by each participant. Therefore, it can be considered that a smart contract is a computer protocol that automatically executes the contract content according to the conditions of each participant, similar to the mode of a computer program "if then". The fast transmission of information in smart contracts helps improve the efficiency of engineering project bidding. Currently, based on the advantage of blockchain technology smart contracts, the entire process of engineering project bidding is placed on a single platform in the system, eliminating the addition of third-party trust centers. All participating parties are open and transparent on this platform, avoiding the review and approval process of various documents in the process, reducing time and cost consumption, and improving the efficiency of bidding work.

At the same time, in the bidding process, the smart contract automatically opens the bidding documents based on the pre-set code, and then automatically evaluates the proposals submitted by the bidders based on the pre-set code. The optimal solution can be obtained by comparing the results of the system's automatic evaluation with the results of expert evaluation. The use of smart contracts not only achieves fairness and impartiality in the bidding and evaluation results of engineering projects, but also reduces unnecessary manual procedures, greatly improving the efficiency of the engineering project bidding process.

6. Countermeasures for Solving the Problems of Engineering Project Bidding Mode Based on Blockchain Technology

6.1 Establish an Information Alliance Chain System

In the blockchain operation system, a virtual information alliance chain based on consensus protocol is established to integrate information and data resources such as bidding and tendering for various tasks and activities throughout the bidding process of engineering projects, so as to make the resource allocation of engineering projects more reasonable and effective. Each node within the information alliance chain designs tasks for each stage in the bidding process of engineering projects, achieving a decentralized distributed structure. On the basis of consensus agreement, information such as management and supervision of engineering project bidding tasks, information review, information exchange, and information data traceability can be stored in a timeline database, and the dispersed relevant information can be connected to the timeline database. The privacy of participants in the bidding process of engineering projects can be protected through encryption algorithms. Therefore, it can effectively solve the problem of low information utilization in the electronic bidding model.

Using blockchain technology to develop the decentralized system for project bidding, it is helpful to build a more secure, effective and credible collaborative information alliance chain system. Using blockchain distributed technology and protocol to form an effective collaboration mechanism, the value of each participant in the project bidding system can be fully recognized and encouraged, and the information communication of the project bidding process is open and transparent. Realizing information data sharing and connection in the project helps to establish the dynamic information alliance in the whole project bidding process. It can be seen from the above that the establishment of information

alliance chain system can effectively solve the problems of information security and accuracy in the electronic bidding mode.

6.2 Use Smart Contracts to Automatically Execute Business

Contracts are the foundation of blockchain technology, and information flow is the core of actual tasks in the bidding process of engineering projects. The structure of contracts is used to deconstruct actual tasks, encode relevant task processes, rules, and other contents in the bidding process of engineering projects onto blockchain, and achieve information sharing among all parties. By pre-formulating rules, protocols, and other contents through smart contracts, engineering project bidding tasks are decomposed. Smart contract technology is used to code the activity rules and protocols of various bidding tasks into the blockchain system and achieve automatic execution, achieving the goal of reducing resource allocation costs. At the same time, smart contracts are used to encode and automatically execute task rules during the bidding process of engineering projects, ultimately determining the evaluation results. In this process, various information data in the blockchain system are used to carefully calculate and obtain the final evaluation results based on the evaluation criteria. Blockchain technology solidifies the authenticity and fairness of the evaluation results. This can avoid affecting the fairness and authenticity of the bidding and evaluation results of engineering projects due to the uneven level of evaluation experts or the unfamiliarity of operators with computers.

For the service commitments uploaded by bidders to the system during the bidding process of engineering projects, by using the smart contract function to compare with the actual situation, the unmet service commitments are converted into digital scores and recorded in the bidder's credit points, to avoid the situation where the bidding enterprise's qualification review fails.

Therefore, this strategy can effectively solve the problems of poor information storage capacity, uneven evaluation expert level, and unfamiliarity of operators with computers in the electronic bidding mode.

6.3 Upload File Information on the Chain

During the bidding process of engineering projects, the bidding party stores the bidding documents in the bidding system, which generates a unique corresponding hash value. The information alliance chain system automatically reviews it. If it passes the review, it indicates that the chain has been successfully uploaded, and the platform will automatically publish the bidding documents. Otherwise, it is necessary to modify the files and follow the above steps again. Through this online operation and the use of blockchain technology's timestamp function, it can ensure that the information in engineering project bidding documents cannot be falsified or tampered with by illegal elements, and also ensure the security of the file content throughout the entire engineering project bidding process (see Figure 2).

During this process, the bidder needs to complete the design of the bidding plan according to the content of the bidding documents released by the platform, encrypt important information in the bidding plan, and then upload it to the platform. After successfully uploading the scheme, the system utilizes blockchain technology to automatically timestamp each bidder's uploaded scheme and store the hash value generated by the bidding scheme to ensure the security and authenticity of important information in the scheme. At the same time, utilizing blockchain technology's overall distributed ledger function, any tampering with the bidding scheme will be recorded. In the subsequent system automatic verification, the bidding plan will be automatically judged invalid, ensuring the fairness of the final evaluation result. In addition, the use of blockchain technology helps to better maintain the bidding market environment.

Supervision units collect bidding information from past bidding enterprises, organize it and convert it into digital credit score tables, and publish them to the public through the platform, to avoid malicious phenomena such as collusion and bidding by bidders during the bidding process of engineering projects.

Therefore, the measure of linking file information can effectively solve the problem of inadequate supervision and inspection by supervisory departments in the electronic bidding model.

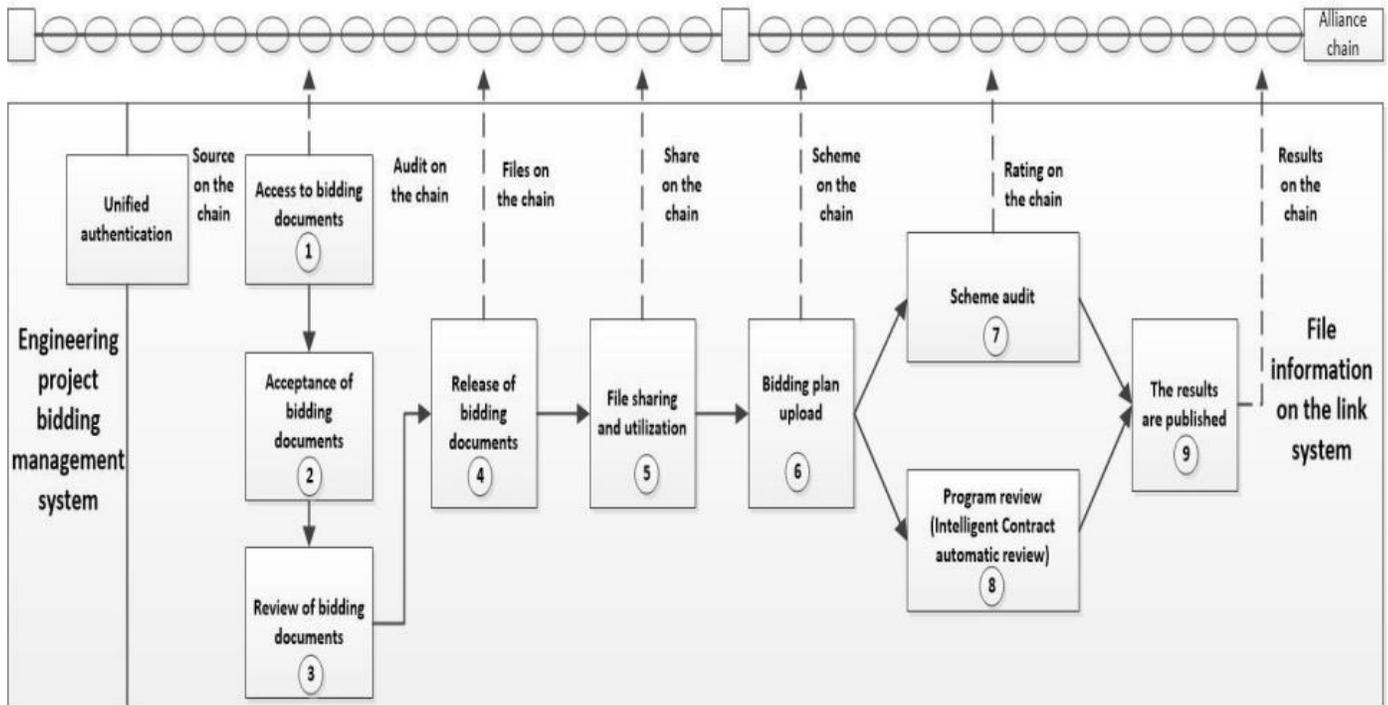


Figure. 2 The Process of Uploading File Information on the Chain

7. Conclusion

As an important component of China's new infrastructure, although there are still some technical and institutional deficiencies that need to be addressed, the potential of blockchain to solve the problem of engineering project bidding mode cannot be ignored. In response to the problems of difficult information traceability and low level of information sharing in the current engineering project bidding model, the engineering project bidding management model based on blockchain technology can create an information alliance system, achieve full process supervision, and fully leverage the traceability, information sharing, information tampering and leakage characteristics of blockchain technology to ensure the continuous, stable, and healthy development of the engineering project bidding field. Blockchain technology, as an emerging technology in the 21st century, is an inevitable trend to promote the healthy development of the entire industry by applying it to bidding activities. It is also an urgent requirement to solve prominent problems in the bidding field and respond to national calls. Blockchain technology will undoubtedly bring new opportunities and development to China's engineering project bidding model.

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