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Design and Implementation of an Online Bidding System Based on Java Web

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ABSTRACT: *This design mainly uses java programming language to complete a javaweb based online bidding management system design, design using the development tool for database SQL Serve. First understand the requirements of the design system, implement the system to improve efficiency, and then describe the techniques and functions used. The system is mainly composed of user management, administrator management, news report, bidding document management, personal information management, five modules, each module do not affect each other but contact with each other. Through this design can realize the user login, view and modify personal information, as well as password security management and a series of related functions. It can be seen from the results of the actual test run that the system has the advantages of beautiful interface, perfect function, less memory occupation, convenient and quick use, and high security.*

Key words: *java; database SQLServe; Software engineering; system design*

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I. INTRODUCTION

In today's era, with the rapid development of the internet and the rapid development of the social economy, various industries are facing new challenges in the context of the pandemic. How can we reduce social interaction and complete bidding tasks for various companies. Better promote economic development. The traditional bidding method before could no longer meet the needs of today's information age. With the rapid development of computers, we need faster and faster bidding methods in the current era of information technology. Tendering and bidding is a fundamental task for a company, so online bidding systems are becoming increasingly important. It can enable more bidding projects to be obtained in a fiercely competitive market. Therefore, I have designed an online bidding management system that can meet this basic requirement.

In this era where the old and new are rapidly changing, more and more intelligent products are replacing traditional things. Life is becoming increasingly intelligent. The era of technology has also arrived. So companies need to seize this opportunity. Replacing manual labor with a network management system can reduce human errors on the one hand. More able to ensure the confidentiality of the bidding documents.

So it is crucial for a company to have an intelligent bidding management system. A qualified and perfect bidding management system. It is necessary to have device information sharing function, and also to be able to easily solve problems that arise during file management operation. Traditional bidding document management and manual saving may bring many uncertainties, which may lead to file damage and loss, and waste a lot of manpower, material resources, and financial resources. An excellent enterprise will have a mature management system to manage its bidding documents. Reduce waste of resources.

The bidding management system is an essential task for the development of all enterprises. For a modern enterprise to have its own future market, it is necessary to have a concise and clear bidding management system [1]. In enterprises, bidding documents are constantly changing, so the management of documents also requires small corresponding real-time updates. Previously, manual management was used, Using paper files may encounter many problems, such as the cumbersome and time-consuming process when searching and the inability to ensure the security and confidentiality of the files. Therefore, for an enterprise that wants to keep up with the times, traditional file management records will eventually be eliminated and replaced. Therefore, for an enterprise that wants to continuously develop and improve, this manual storage method will eventually be replaced.

In the prospect of rapid modern development, information technology has spread all over the world, and computers have appeared in every corner of our lives. The network has also brought me various conveniences. Computer storage and management can be quickly deleted and added, with high security and faster queries. Under the social and background mentioned above, this design system was studied. Developing this system not only ensures the correctness of bidding documents by correctly managing the retrieval and storage of documents, but also greatly reduces costs, reduces labor costs, becomes more efficient, and saves a lot of time. Isn't it the best of both worlds.

II. TOOLS FOR MANAGING ONLINE BIDDING SYSTEMS

Introduction to Development Tools

Database technology plays an important role in modern software development, and is widely used in various applications such as e-commerce, finance, healthcare, social networking, and other fields. For developers, mastering database technology can help them better manage and manipulate data, thereby developing more efficient.

SQL Server is a relational database management system (RDBMS) developed by Microsoft, which is based on Transact SQL. SQL Server provides efficient and reliable data storage and processing capabilities, supporting applications ranging from small to large servers, such as data warehouses, online transaction processing (OLTP), business intelligence, and web applications. SQL Server has the following characteristics:

1) High availability: SQL Server supports clustering technology and high availability features such as backup and recovery. Security: SQL Server provides rich security features, such as user and role management, data access permission control, and so on.
2) Scalability: SQL Server can run on a single computer or multiple servers, and can scale as business grows.
3) T-SQL language: SQLServer supports Transact SQL language, which is a general relational database language and can perform advanced query and data modification operations.
4) Ease of use: SQL Server provides a user-friendly graphical interface, making it easier for developers and administrators to use and manage databases.

In summary, SQL Server is an efficient, reliable, secure, and scalable database management system widely used in various enterprise applications and website systems.

Introduction to Development Language

Java is a widely used computer programming language with characteristics such as simplicity, object-oriented, and cross platform. The advantages of Java are as follows:

1) Cross platform: Java programs can run on different hardware and operating system platforms without the need to write different code for each platform, greatly reducing development and maintenance costs.
2) Object oriented: Java is an object-oriented programming language that supports features such as encapsulation [3], inheritance, and polymorphism, making code writing more flexible and extensible.
3) Security: Java provides security guarantees, including a security sandbox mechanism and built-in security detection tools, making Java applications more reliable and secure.
4) Balancing performance and development efficiency: Java has a good balance between performance and development efficiency, allowing developers to efficiently write robust and efficient applications.
5) Rich development tools and ecosystem: The Java ecosystem is very rich, with a large number of excellent development tools and frameworks, such as Eclipse, IntelliJIDEA, Spring, etc., which can greatly improve development efficiency and quality.

In short, Java is an excellent object-oriented programming language with characteristics such as cross platform, security, and excellent performance, suitable for the development and maintenance of various scale applications.

III. FUNCTIONAL MODULE ANALYSIS AND DESIGN

Requirement Analysis of an Online Bidding System Management System Based on Java Web

1) Functional Requirements Analysis: In order to ensure the security of the bidding documents, the identity authentication function will be implemented. If the username or password is incorrect, the overall security cannot be guaranteed; The registered administrator in the system has different permissions to manage users; Administrators can delete, view, and modify bidding documents; Users can view bidding information by viewing news; Change the user's own information; Review the bidding documents to participate in bidding.
2) Practical analysis: Analyze the feasibility of the design, meet larger needs with the least cost, and create greater economic benefits. Based on the needs of enterprise customers, design the system to find feasible and suitable methods for design. Thus, the management of bidding projects can be designed and implemented technically, technically, and legally. Reduce investment in manpower and resources.
3) Analysis: This system design mainly includes the development of front-end web page layout, the connection between backend data and backend database, as well as database maintenance and repair, in order to achieve fast, simple operation, wide applicability, and compatibility functions. Therefore, compared to the maintenance and management of databases, ensuring the security and stability of the database [4]. The focus of the design is on writing the front-end page, receiving and saving the back-end data, and detecting the system software. Java, big data, C language, etc. can help us design systems that are efficient and can create more benefits. We constantly learn and improve during development, so I believe that the system I designed can help us become more efficient.

Design and Implementation of an Online Bidding System Based on Java Web

Firstly, the main task of this program is that when a new user wants to register, there will be a form to fill out and submit with their real name information according to our designed system program. After the submission is completed, they will wait for review. At this time, the backend staff will receive the message and verify the message. When the review requirements are passed, Confirming the reliability of the registered user's information will return a successful registration prompt to the front-end page until the process is completed, and the generation of new users can be confirmed. The user can then proceed with the next steps. Next, once the new user has successfully registered, they can log in. After logging in, there will be a personal information modification session for themselves, where they can modify their bidding content in real time. They can also participate in bidding to view others' bidding projects and modify their content in real time. If other users select their own bidding content, they can learn more and upload their relevant content to let bidders know their relevant information, waiting for the bidding party to review and compare their content. When the review is approved by the bidding party, the bidding user and the bidding user can further discuss and sign the contract between Party A and Party B. If there is any privacy related content or amount discussed during the discussion, the agreed condition is that those with privacy function [6] can only be viewed by both parties, and other users cannot view them.

In the entire process of software system design, service developers will use decomposition and coordination methods to divide and develop modules and functional subsystems based on the relationship between service functions, in order to achieve the goals of software development. That is to say, developers will determine modules and functional subsystems according to the relationship between functions. Each module reduces coupling and has a clear hierarchy. It is an orderly system to avoid repeated coordination.

IV. DESIGN AND IMPLEMENTATION OF A NETWORK BIDDING SYSTEM

Implement functionality. It can be basically divided into four parts. First, the user registers and logs in. The second section views the bidding capacity, the third section adds and deletes bidding projects, and the fourth section conducts bidding. As shown in Fig. 1.

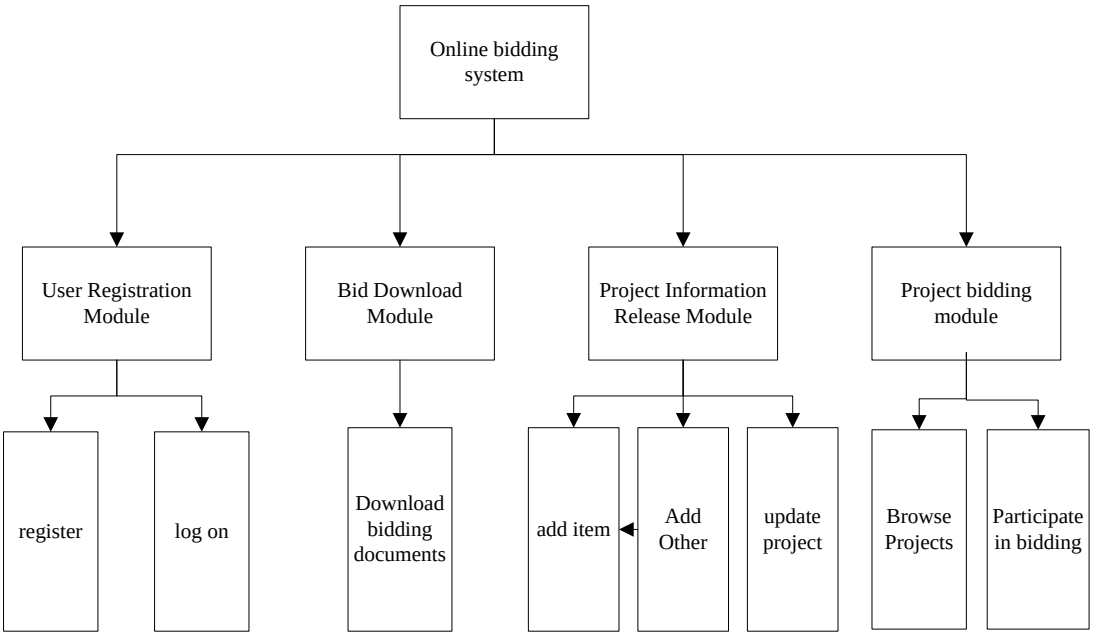

Fig. 1 Relationship Flowchart

User Registration

Write code through Java to achieve the basic structure of registration by binding events through JavaScript operations.

If the format required for regularization is met, the registration is completed through verification. If it does not meet the requirements, a corresponding prompt will pop up to remind the user. Please refer to Fig. 1 for the specific content of re registration.

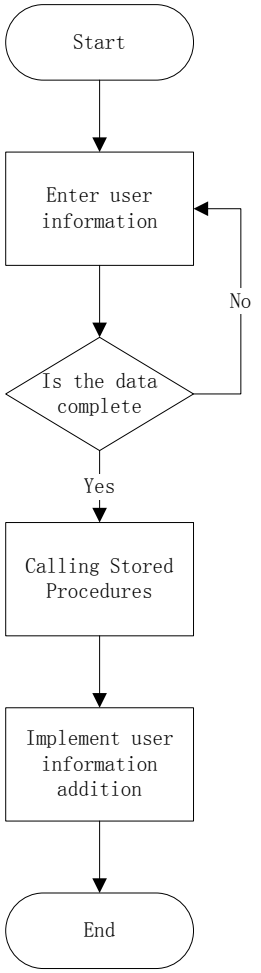

Fig. 2 Process Flow Chart

After writing the username and password during user registration, the table data will be transferred to the database, which compares the incoming data with the original data in the database.

User Backend

After the user completes registration, they can enter the user's management backend and change the information. After clicking on confirmation, the information will be uploaded to the database and overwritten with new data.

User Manager

In the system, different identities will have different permissions, which are used to maintain user information and functions. The two main entities in the system are users and user administrators, and different identities will use different permissions. Each user forms a vast user group, and the administrator will manage each user. When registering, there will be different levels of classification, and different levels of classification will also have different audit standards. For ordinary users, it is level one, for members, it is level two, and for super administrators, it is level three. Different levels will also undergo different audits. Having the same functions, when registering as a third level super administrator, the registration content will be more demanding. After being authenticated by the backend database, the super administrator will be recognized by the system to have more functions, such as modifying and deleting ordinary user information. And different users can be grouped and processed.

Bidding Process

When companies compete, there will be comparisons. Multiple users are bidding, and the one with a higher price will successfully bid. And those with lower prices will fail. The specific process is shown in Fig 5

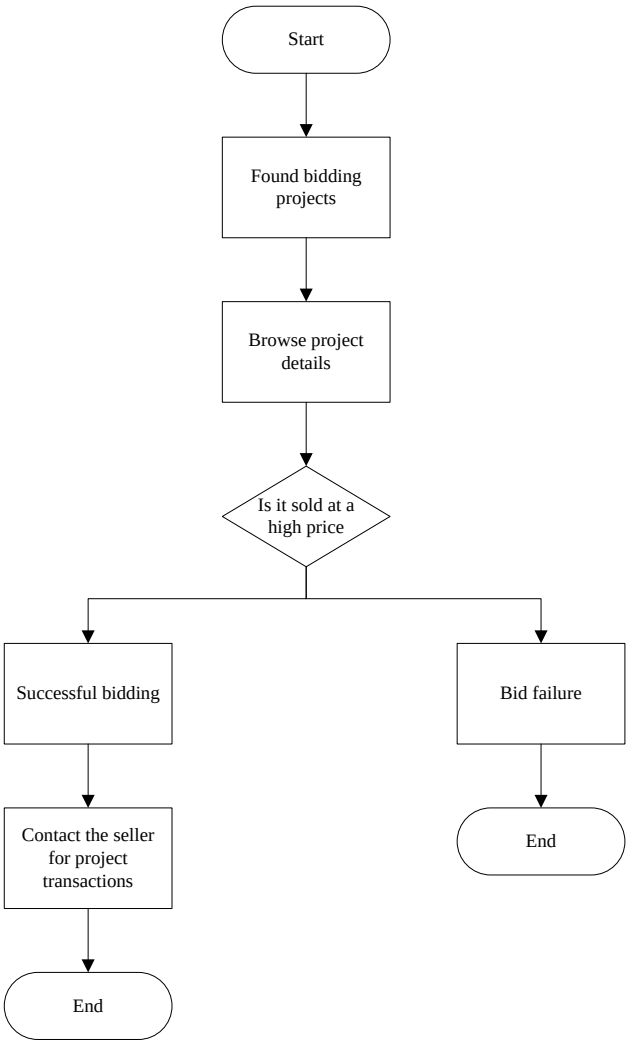

Fig. 5 Bidding Process Flowchart

When a user wants to bid, they first need to search for the project they want to bid on, compare the information with the user, and check whether the bidding content is what the user wants for information comparison. Users provide their own bidding prices, and the backend compares the prices provided by all users. Find the maximum value and provide feedback to the front-end. The bid is successful if the price is the highest. Contact the bidder, and the lower price is the failure of the bidding. End the process.

Message Board Function

In addition, this system also has a message board function, which is accessible to all users for feedback. When users write, personal information should also be filled out to facilitate the management of message information by administrators. The message board has been written and finally submitted. Submitting the backend database will receive it. And save it in the front-end page. The administrator can operate on Yonghui's messages and delete and modify any messages that do not meet the requirements. This feature not only allows system managers to discover user issues in real-time. Timely feedback is also possible. Provide users and management systems with a better experience. A good system is good at listening to user suggestions when constantly updating, and timely correction of problems can make the system more perfect.

V. SYSTEM TESTING

Software testing should include checking whether the code is complete, logical, correct, and standardized. The basic testing methods of software mainly include static page testing, dynamic system performance testing, functional testing, performance testing, black box testing, and white-box testing [14]. When testing the system, the main focus is on testing different testing environments and obtaining test results.

Environmental Testing

Firstly, conduct testing of the system environment. On the cmd and csdn platforms, jdk downloads the csdn according to the required steps. Then, configure the environment variables in the database to run the code [15]. This is very important. Then, write Java code and run it on the page. Use version software to view the jdk version. If there are no errors during the process, it indicates that the required environment configuration for the system has been successfully completed. If an error occurs during the operation and the dk file location required by the system cannot be found, it is found that the error is caused by multiple installations of the same point jdk. At this point, only one of them needs to be deleted to ensure the complete operation of the system. However, when configuring the client environment, only one folder's absolute path is duplicated. After solving these two basic problems, we can run the written Java programming, which indicates that the environment testing is successful and the next step can be taken.

The first step is to test the registration function of the system. We divide registration into three levels: first, second, and third. When users register, there will be different levels of registration. Users can register according to their own needs, and there will be different registration contents that need to be filled in for different users.

When the user registers, the page will also jump to the location shown in Figure 1-1. The system design requires the user name, password, name, and phone number to be filled in. Regular expressions in Javascript are used to determine whether the user name, password, name, and phone number of the required items have been filled in. Registration is only allowed when the user's registered content meets our specifications in Javascript. And the backend will also receive and save the front-end data to the backend database. In addition, when we complete registration and submit it to the backend, we will verify it. This function is to prevent unnecessary trouble caused by duplicate user names. When users submit their registration information, the backend will perform global matching in the database [16]. Check if there will be the same username, and if the username exists, a corresponding prompt will pop up.
Allow users to re register to prevent data errors and other issues.

If the username and password entered by the user cannot be found in the database, it indicates that the registration has not been completed, or if the username and password entered do not match, the login system will redirect to the page where the user enters the username and password to continue filling in.

After logging in, users can enter the backend and view and modify their personal information through logging in.

When a user logs in, they will have two identities: the bidding party and the bidding party [16]. When a user wants to bid, they can click on the website news to publish the news. Publish bidding content in the form of on-site news. When publishing, you need to fill in the title, type, and detailed content of the user's bidding, as well as the person who added it. After being checked and verified by the user, you can submit it. At this time, the user's bidding documents will be stored in the database or displayed on the page in the form of on-site news.

When users finish posting their bidding content, the database records it [19]. After completing this, users can still view the internal news or bidding documents they have published. When they discover errors in their bidding content during the viewing process, they can still make modifications. Even delete your own bidding content and republish it.

Users who want to view their bidding information and their bidding process share a similar process. They can click on the transaction record, and the subsequent database will mobilize data to make the content they want to view appear in the front-end for users to browse. Of course, users can also make actions on their own content. You can obtain the data you want and modify by connecting to the backend.

Analysis of Test Results

Firstly, conduct registration testing and strictly adhere to the required information during registration. If the information is not filled in according to the specifications, the system cannot accept it, and the backend will not record or provide feedback. At this time, the user will be reminded to redo the writing. After logging in, there will be more functions. Functions such as initiating bidding, bidding, and leaving messages.

When performing system detection functions, it is evident that a webpage not only requires front-end page beautification, but also requires the rigor of back-end data. Programming is a very rigorous task, and every

detail should be scrutinized during this process. A small mistake may lead to system crashes. To complete a perfect system, it is not only necessary to beautify the front-end image, but also to process the back-end data. It is very important to closely follow every link and storage of each data, and have clear logic. When data changes, data should be changed in a timely manner, and each data storage should be tested. Finally, database testing should be completed [17]. The final designed system can be preliminarily and completely implemented.

VI. CONCLUSION

This design mainly implements the design of a Javaweb based network management system [20]. After investigation and analysis, developers determined the main content to be completed. After determining the bidding management system to be completed, they investigated the style requirements and found that every excellent company would have a simple and clear bidding document management. Then they sorted out the functional modules, drew a simple structural framework, and then used databases and programming languages. Build an environment to meet functional requirements. After the design is completed, corresponding testing work should be carried out to meet the corresponding technical indicators. The designed network bidding management system should meet the following functions:

1) User login function: Register on the homepage, and after registration, log in to the backend management system to view personal information;
2) The bidding information publishing function of the bidding party: After logging in, users can publish the bidding information they need in their own backend management system by publishing news. This information can be displayed on the front-end homepage for viewing;
3) User bidding function: After logging in, users can directly click to view bidding information from the news section of the main interface for bidding. You can also directly query and bid on the backend;
4) Message function: It can be used to comment on the website after logging in, express one's own opinions to help improve the website, and express one's own ideas.

At present, the project has implemented functions such as static homepage recommendation, user login, publishing bidding information, and participating in bidding. The website system implemented has the characteristics of strong operability, comprehensive functionality, and strong scalability. However, due to the lack of a competitive backend database on pricing during bidding and the writing of related programs. So the system cannot conduct bidding and cannot compare users who are bidding, directly selecting users with higher prices. Therefore, I still need to continue learning to build corresponding databases and query relevant information to further improve the system.

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