Design and Application of Entrusted Judicial Expertise System Under the Background of "internet plus Public Judicial Service"

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Abstract. According to the problems of low expertise efficiency, opaque expertise situation and lack of effective supervision in the judicial expertise procedure under the current background, the author of this paper developed a commissioned judicial appraisal system under the background of "internet plus Public Judicial Service" based on ASP.NET framework and combining database technology with web technology. The system carries out the judicial expertise procedure through Internet technology, provides an effective way for the court, the parties and the judicial expertise institutions to link up information, realizes information sharing, improves the efficiency and quality of handling cases and offices, and then provides technical support for the society to provide efficient, pragmatic, transparent and fair judicial expertise public services.

Keywords: public judicial services · entrusted judicial expertise · Internet · ASP.NET

1 Introduction

Judicial **e**xpertise is a very important link in China's judicial authentication system. Most public security organs and units need professional theoretical support in the process of investigating cases, and judicial expertise is responsible for this task. With the continuous advancement of law popularization in China, it is more and more common for people to take legal weapons to safeguard their own interests, which leads to the increasing number of all kinds of litigation cases. However, the judicial expertise department can just use the opinions of relevant experts to help the public security organs solve all kinds of difficult litigation professional problems, and the service quality of judicial expertise greatly affects the promotion of cases [1]. According to the data, compared with more than 2.23 million pieces of forensic business in 2020, it will increase by more than 25% in 2021, reaching more than 2.8 million pieces, which will keep a continuous growth trend. By the end of 2021, there were only more than 2,900 judicial expertise institutions and more than 37,000 judicial authenticators in the country. The number of judicial expertise institutions is difficult to handle a large number of judicial expertise cases with such a rapid growth rate, which leads to a long time for judicial expertise

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cases, and some cases are difficult to be closed easily, which will cause damage to the legitimate rights and interests of the parties, resulting in inadequate public judicial services. In addition to the huge number, there are also problems that cannot be ignored in the implementation of judicial expertise. The process of judicial expertise is divided into four major steps: entrustment, evidence collection, cross-examination and acceptance. However, in many places, the procuratorial departments are prone to lack of supervision over judicial expertise management. The client of the court doesn't even know the specific situation of the appraisal institution, and doesn't know whether the practice certificate of the institution and the qualification of the appraiser are in doubt, which leads to the situation of black-box operation. And in this process, if the relevant personnel neglect their duties, resulting in the serious consequences of losing, damaging or even falsifying the identification materials, the legitimate rights and interests of the parties will be seriously damaged, which will make the judicial expertise work lose the original principle of maintaining fairness and justice. Moreover, the process of circulation of evidence documents among all parties is slow, and there is a lack of effective connection. Moreover, in the process of dealing with forensic cases, only the relevant departments of forensic science will be exposed to the specific progress information of the cases, and most of the parties are not clear about the specific process and situation of forensic science cases, which leads to the dissatisfaction of the parties, which affects the credibility of judicial work in China and damages the authority of forensic science [2]. In order to further deepen the reform of China's judicial system, we need to constantly improve and unify the judicial expertise management system. Therefore, it is imperative to carry out work to solve various problems in the current judicial expertise management, and the advantages of the Internet can just put forward effective solutions to these problems. "Internet plus" is a new development model. This model is to give full play to the rapid and integrated role of the Internet, and constantly combine information technology with the achievements of various trades and industries such as economy and culture, so as to promote the development of productivity and social innovation in the whole society, so that all people can enjoy the fruits brought by the advantages of the Internet. With the development of "internet plus", all walks of life have made innovations. Judicial work is no exception. The combination of judicial services and the Internet can make some judicial expertise services that can only be completed in court windows become activities that the public can participate in by using various online network platforms, which will be more conducive to the public's convenient, quick and timely viewing and play an effective supervisory role. Taking data running more errands and people running less as the starting point, we should speed up the work efficiency of judicial expertise related departments, break through the inherent judicial expertise service mode and improve the "one-stop" service of judicial expertise [3].

According to the above analysis of the current situation of judicial expertise environment, the author of this paper thinks that developing a commissioned judicial expertise system under the background of "internet plus Public Judicial Service" can effectively solve the above problems. This system is developed based on ASP.NET technology and C# language using SQL server database technology. The system realizes the dynamic unified management of the whole process of entrusting, obtaining evidence,

cross-examination and accepting letters in judicial expertise activities, improves judicial services in judicial expertise, speeds up the innovation of "internet plus" judicial services, improves the working efficiency of judicial organs, speeds up the process of protecting the legitimate rights and interests of the parties, and then promotes the rule of law construction of socialism with Chinese characteristics.

2 Key Technologies

2.1 ASP.NET

ASP.NET is a mature technology of Microsoft Company, which is used to create server-side Web applications. As a unified Web development model, ASP.NET provides developers with various services necessary to generate enterprise-level Web applications with as little code as possible. ASP.NET is provided as a part of the. NET Framework. When developers write the code of ASP.NET applications, they can access the classes in the. NET Framework. Developers can use any language compatible with the Common Language Runtime (CLR) to write application code, including MicrosoftVisual Basic, C#, and JScript.NET. Using these languages, they can develop ASP.NET applications that take advantage of the common language runtime, type safety, inheritance, and so on. The architecture of ASP.NET is shown in Fig. 1 [4].

2.2 MVC

MVC is an inherent mode that facilitates developers to design software systems, where M refers to model, V refers to View, and C refers to controller. MVC pattern is to separate business logic layer from data. All application components are divided into three parts, namely business logic, interface and data. You can make the same program use different forms of expression. If the data fed back to the model by the controller changes, the model will inform the relevant views in time, and the views will refresh their displayed contents accordingly. Because the model is independent of the view, the model can be reused, and the model can be independently transplanted to other places for further use. The separation of front and back codes makes the division of labor in project development clearer, the testing of programs easier, and the development efficiency higher. In fact,

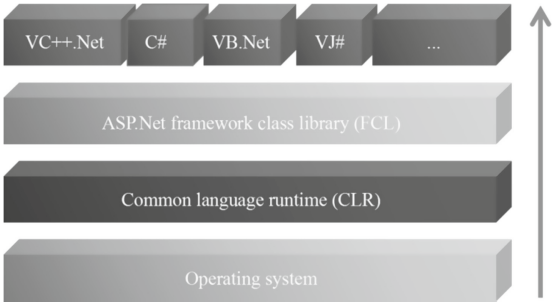

Fig. 1. ASP.NET architecture diagram

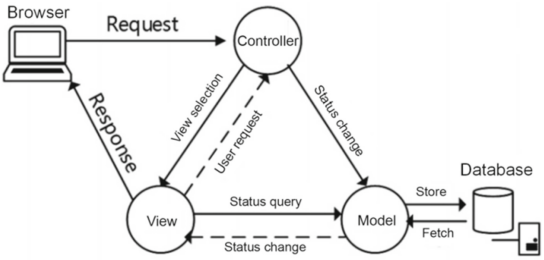

Fig. 2. MVC mode architecture diagram

the function of the controller is similar to a relay station, which will decide which model to call to handle user requests and which view to call to present to users [5].

The browser makes requests to the controller and receives responses from the view layer. The responsible view layer of the controller tries to select and receive the user request returned by the view layer and change the state of the model layer. The view layer can query the status of the model layer, and the model layer can change the status of the view layer. The above process is shown in Fig. 2.

Coupling: The low view layer is separated from the business layer, so that the code of the view layer can be changed without recompiling the model and controller code. Similarly, the change of an application's business process or business rules only needs to change the model layer of MVC. Because the model is separated from the controller and view, it is easy to change the data layer and business rules of the application.

High reusability: A model can be shared by multiple views, which means that the data returned from the model can be displayed in various ways, without writing specific codes for each display way, thus greatly reducing the amount of codes.

Fast deployment: Using MVC pattern can shorten the development time considerably. The back-end programmers concentrate on business logic, while the front-end programmers concentrate on presentation.

High maintainability: The separation of view layer and business logic layer also makes WEB applications easier to maintain and modify. Conducive to software engineering management. Because different layers perform their duties, different applications of each layer have some same characteristics, which is beneficial to manage program codes through engineering and materialization.

2.3 Visual C#

C# is a safe and stable programming language introduced by Microsoft in Visual Studio.NET, which is component-oriented, powerful and flexible. # C language is very similar to C++ and Java, with clear style, strong readability and easy to master.

C is developed from the C/C++ language. The C/C++ programming language is powerful, but it is more complex, which requires more time and energy. While languages such as Visual Basic have high programming efficiency, their underlying development functions are poor. In contrast, C# can better balance the relationship between function and efficiency. On the one hand, C# has an inheritance relationship with C/C++, which

keeps and expands the functions of C/C++, and C++ developers are easy to be familiar with. On the other hand, using C# can quickly write various applications based on Microft.NET platform. Because Microsoft.NET provides a series of tools and services, C# program development has higher efficiency [6].

2.4 Development Environment

Under the background of "internet plus Public Judicial Service", the hardware operating system of the entrusted judicial expertise system is Windows 10, and the integrated development environment is Visual Studio 2019 Chinese version, and the Web server is IIS8.5. In the framework of ASP.NET based on. NET Framework 5.0, we use MVC pattern, C# language and NHibernate as a database persistent connection tool for web development. The system uses SQL Server 2019 to create a database. In view technology, it mainly includes static page HTML, style file CSS, scripting language JS, dynamic interactive technology AJAX, front-end component library BootStrap. Through the introduction of the above key technical theories, we have determined the overall environment of the system development, the configuration of related software and tools, and the technical feasibility of entrusting the judicial expertise system to build the overall project under the background of "internet plus Public Judicial Service".

3 Requirements Analysis

3.1 Functional Requirements

In order to ensure the rapid progress of judicial services, the entrusted judicial expertise system needs to make an effective functional demand analysis of the whole process of judicial expertise, including entrustment, evidence collection, cross-examination and acceptance. The system roles are divided into three categories: appraisers, parties and court clients. Different users can control the corresponding resources according to their different roles, use the response mechanism of the interface provided by the controller, and inform the authentication management system model to perform tasks, so as to realize the interaction between different users and the process control of the actual authentication information. The client port needs the function of submitting an electronic application for judicial expertise to the court in the system, selecting the function of judicial expertise institutions, and having the main function of checking the progress of judicial authentication at any time. The court client needs to have access to the practice of the judicial expertise institution, and also need to realize the process of electronic document handover with the judicial expertise institution. The system needs to provide appraisers with the main functions of submitting appraisal results and reporting the appraisal process. At the same time, it can adapt to the changes of forensic management requirements in forensic management. When new functions are introduced, it is necessary to ensure good scalability.

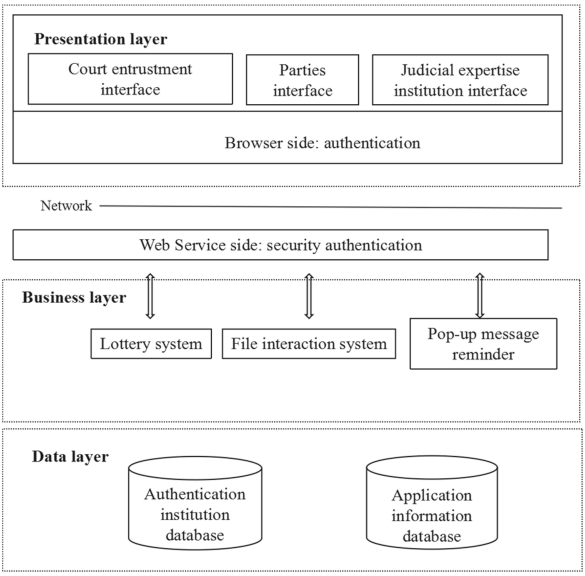

Fig. 3. System overall framework diagram

3.2 Global Design

The entrusted judicial expertise system based on ASP.NET framework adopts browser/server (B/S) architecture, which is divided into three layers: presentation layer, business layer and data layer. The overall architecture of the system is shown in Fig. 3. In the original application mode of ASP.NET, there is usually the problem that the view layer and the business logic layer are too coupled. In order to solve this problem, this system chooses MVC mode, so that all applications can be divided into several parts and developed separately. Each part runs as a single logical component. This will greatly improve the development efficiency, form a reusable basic functional unit, and effectively improve the reusability of software code. The presentation layer is provided with three user port interfaces: court entrustment, parties and judicial expertise institutions. The system is authenticated through the web service of the network. The main functions of the business layer include the lottery subsystem, the file interaction subsystem and the pop-up message reminding subsystem. The data layer mainly includes authentication institution database and authentication file database [7].

4 Functional Implementation

4.1 Parties Client

After registering and logging in the system through ID card information, the parties can see four functional modules: application for appraisal, selection of appraisal institutions, appraisal progress and online communication. The parties need to apply for judicial expertise within the specified time. The parties concerned click into the judicial

expertise application module, download the judicial expertise application in standard format provided by the system, fill in and submits it, submit the electronic version of relevant materials at the same time, and click to pay the authentication fee to complete the judicial expertise application. The file upload process of the system needs to call the handleFileUpload () method of the file upload class of FileUploadController, and the parameter is FileUploadEvent object. First, declare the method, @ ManagedBean (name = "FileUploadController"), @RequestScoped, and the specific code is shown in Fig. 4. Whether it can be specifically approved or not still needs to be examined by the court. After the parties apply for appraisal and the court agrees, the court will issue a notice of application for approval to the parties through the online communication module of the system. The parties users click into the Select Authentication Institution module, and can see the list of authentication institutions sorted by the type of authentication quantity and the type of acceptance rate. The parties can accurately find the authentication institution by inputting keywords. After that, with the help of the court, the plaintiff and the defendant in the case jointly select the appraisal institution. If they disagree, they can click the random lottery function of the system to screen again. The random lottery function subsystem needs to determine the lottery range to start lottery, and the parties choose the final main selection and alternative appraisal institutions according to the lottery result. After the judicial appraisal process starts, users can click to enter the appraisal progress module, where they can see the transportation of appraisal materials, the appraisal progress of appraisal institutions, and the court review progress to know the progress [8].

4.2 Court Client

The users of the personnel of the judicial expertise department of the people's court are responsible for unified external entrustment and organization of judicial expertise. The main function of the court is to approve and authenticate the judicial expertise process, initiate entrustment, manage cases, and review the authentication results. The client clicks into the approval authentication function module to see the pending and processed judicial expertise applications. Click "to be processed" to review the application submitted by the parties and related materials, and deal with the passing and failing. After the parties' application for judicial expertise is passed, after the parties have chosen the judicial expertise institution, the court initiates the authentication commission on the system. Before the court initiates the appraisal entrustment, the court entrusting party can check the information about the institution's acceptance rate, appraisal quantity, qualification certificate, address, the person in charge of the appraisal institution, instruments, equipment and laboratories, and the business scope of judicial appraisal through the institutional information of the system. The client's right to know can be well guaranteed by the court's understanding of the practice of appraisal institutions and appraisers. The court will issue the electronic version of the judicial expertise power of attorney to the client of the judicial expertise institution by initiating the entrustment function module after verifying the information of the judicial expertise institution. When the court user receives the pop-up reminder of the acceptance notice issued by the judicial expertise user, the user can see the authentication progress information of the case in the case management module. When the users of the judicial expertise institutions upload

```
public class FileUploadController
  private boolean isrendered=false;
  private String filename;
  private StreamedContent uploadImage;
  public void handleFileUpload(FileUploadEvent event) throws IOException {
  UploadedFile uploadedFile = event.getFile();
HttpServletRequest request
=FacesContext.getCurrentInstance().getContext().getRequest();
  String path
  =request.getSession().getServletContext().getRealPath("/")+"uploadfile";
  path=path.replace("/", "\\");
  System.out.prnumberln("path: "+path);
  String
uploadfilename=FilenameUtils.getName(uploadedFile.getFileName());
  InputStream input = uploadedFile.getInputstream();
  OutputStream output = new FileOutputStream(new File(path,
uploadfilename));
  try { IOUtils.copy(input, output);
  } finally {
  IOUtils.closeQuietly(input); IOUtils.closeQuietly(output);}
  filename="/uploadfile/"+uploadfilename;
  System.out.prnumberln("upload filename: "+filename);
FacesMessage msg = new FacesMessage("Succesful", filename + " is uploaded.");
```

Fig. 4. File upload function implementation code

the authentication opinion files on the platform, the court client will receive a pop-up reminder of "No.**** judicial expertise procedure has been completed". At this time, the users click to enter the function module of reviewing the authentication results, and the case can be found in the chronological list of cases that have been reviewed by the judicial expertise institutions. Click to view the appraisal opinions returned by the appraisal institution, and the court users need to confirm in time whether the technical methods adopted in the appraisal opinions are consistent with the requirements of the judicial appraisal standards, strictly examine the appraisal documents and technical evidence materials submitted for trial, put forward opinions, and finally decide whether to adopt them [9].

4.3 Judicial Expertise Institution Client

The user of the judicial expertise client is the person in charge of the judicial expertise institution. After logging in to the system, users of judicial expertise institutions can see the three sub-functional systems of the client, including receiving judicial expertise entrustment, reporting the judicial expertise process and submitting judicial expertise opinions. Click on the judicial expertise entrustment interface, and the user can see the list of judicial expertise entrustment received by the judicial expertise institution, which can be divided into two categories: unreceived and received. Click on the list in the column not received, and the user selects the case to view the details of entrustment. Details include the identity information of the entrusting party's undertaker, the power

of attorney for judicial expertise, the type, quantity, characteristics and preservation information of the materials submitted for authentication, etc. According to the detailed information of the case, the user puts forward opinions on whether to accept the case. If the acceptance conditions are met, the person in charge will fill in and submit the "judicial expertise Case Acceptance Approval Form" provided by the system and send it to the court entrusting party to complete the acceptance of judicial expertise entrustment. After the appraisal institution receives the appraisal materials, the user needs to click Confirm Start in the judicial appraisal process report module on the system to start the appraisal, and the progress of the appraisal process needs to be updated by the person in charge in time. After the appraisal work is completed, appraisers need to issue appraisal opinions through the system's opinion submission module, upload appraisal opinion documents on the platform and send them to the entrusting court to complete the appraisal [10].

5 Conclusion

The continuous development of the Internet has both advantages and disadvantages for judicial expertise. Under this background, the relevant departments and institutions of judicial authentication should keep pace with the development of the information age, constantly combine judicial authentication with Internet technology, and realize the modernization of judicial authentication. In this way, the efficiency and accuracy of forensic services can be improved by improving the scientificity and stability of forensic services.

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