

# Construction of Social Work Information System in Ethnic Areas Based on Web Technology

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## ABSTRACT

Based on Web technology, combined with MVC development mode, the social work information system in ethnic areas is constructed under J2EE specification. With the help of the application advantages of network information technology, combined with the current information service concept of social work, this paper puts forward comprehensive solutions to the problems of lagging development of social work, shortage of professionals and imperfect management in practical fields in ethnic areas. Based on the actual needs of social workers, social work service agencies and civil administration departments, and the actual business processes of users at all levels, the system starts from many aspects to improve the process, standardization and specialization of social work in ethnic areas, and effectively improve the current development status of social work in ethnic areas. It not only makes an important contribution to promoting the harmonious and stable development of ethnic areas and maintaining national unity, but also provides a necessary innovative attempt to build a social governance pattern of "co-construction, co-governance and sharing".

**Keywords:** *Web technology; MVC mode; ethnic areas; social work; informatization*

## 1. INTRODUCTION

As a multi-ethnic country, China has always taken "strengthening national unity and promoting economic development" as an important goal, as the focus of all work. Since the reform and opening up, the economy, society and culture in ethnic areas have achieved unprecedented leap-forward development, achieved brilliant achievements that attracted worldwide attention, and officially ushered in the best and fastest development period in history. However, China's ethnic areas are mostly distributed in the border areas such as northeast, northwest and southwest. The harsh natural environment, slow urbanization and lack of infrastructure and supporting facilities are still prominent problems that restrict the economic and social development of ethnic areas. In the development process of the new era and new stage, the contradiction between the opportunity of the times and the development problem is faced by the government and the society. How to use the professional ideas, working methods and service means of ethnic social work to promote the effective development of modernization in ethnic areas and achieve the overall goal of modernization of state

governance is the content that social workers in ethnic areas need to study and seriously discuss [4].

Social work has five elements: object, goal, subject, ethics and method, aiming at providing professional social services for many individuals, objects and groups in difficulty, solving social problems, promoting the implementation of social policies and safeguarding the legitimate rights and interests of recipients. Its core goal lies in promoting economic and social development, improving people's livelihood, promoting and innovating social construction and social management. Among them, its subjects are social work service agencies and social workers, and they advocate "helping others and helping themselves" as the basic working principle, that is, they expect "humanistic care" help to enhance the independence and autonomy of clients when they solve difficulties. In practical application, social work has been involved in the modernization of ethnic areas through service governance, and various social work practice activities have been carried out in ethnic areas one after another, which has played a positive role in establishing social relations of equality, unity and mutual assistance and maintaining the stable social development in ethnic areas [7]. But at present, the development of social work shows obvious

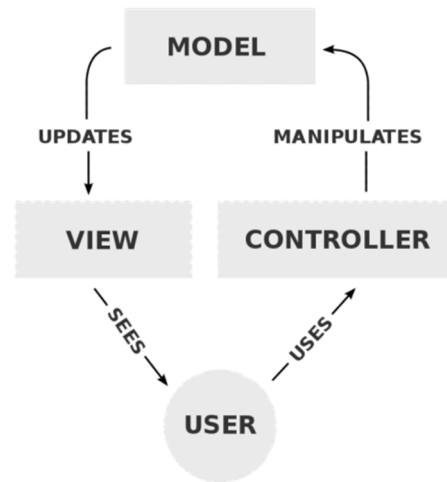
imbalance. This imbalance is not only reflected in the development gap between the eastern, central and western economic belts, but also in the obvious differences between urban and rural areas and within provinces. However, social work in ethnic areas in China is also influenced by regional policies and regulations, national consciousness mentality, cultural value orientation and other factors, resulting in problems such as low social work recognition, lack of professional talent resources, unbalanced social work development structure and insufficient management in practical fields [6]. In view of this, this paper holds that based on Web technology, J2EE application development specification and MVC pattern as the core requirement, a social work information system with perfect functions and convenient use can be built which meets the specific needs of social work in ethnic areas. According to the task structure and practice system of social work in ethnic areas, the system will focus on the real needs of three different users: social workers, social work service agencies and civil administration departments in ethnic areas, and realize the information processing and fine management of social work. It not only fundamentally solves various problems existing in social work in ethnic areas at present, but also avoids cultural awareness conflicts of some social work. It will also effectively improve the operational efficiency of social work, enhance the innovation and effectiveness of social work practice, make it more suitable for the actual needs of ethnic areas, effectively solve the problems in ethnic areas, and further promote the coordinated and synchronous development of the modernization of governance in ethnic areas and the modernization of state governance.

## 2. KEY TECHNOLOGY INTRODUCTION

### 2.1. MVC pattern

MVC(Model-View-Controller) pattern is a mature technology in information system research at present, which essentially belongs to the development pattern of software engineering. In MVC pattern, the Model refers to the functions that an application should have or a number of different algorithms to realize functions, as well as the objects that access data under data management. View is a graphical interface design by interface designers, aiming at visualizing the data contained in the model. The Controller is responsible for forwarding and processing the request. The controller mainly acts on models and views. It controls the data flow to model objects and updates views when data changes. The running process relationship of the three components is shown in Figure 1. When the user interacts in the View interface, all kinds of requests are screened by the Controller, and different types of requests are sent to the corresponding Model. The Model model interacts with the data service

according to this request, and selects the corresponding View view to display according to the corresponding business processing logic, so as to give the feedback information of the user's request and complete the "request-response" running mode [8].



**Figure 1:** Operation process of MVC pattern

The extensive application of MVC pattern provides great convenience for the development of application server, and further derives many MVC frameworks. The MVC framework contains the basic structure of MVC. In the process of application development, the design and construction of the application server framework can be realized only by extending the basic structure and placing the corresponding setting files in the corresponding directory address. At the same time, the MVC framework also includes many ready-made and fully tested functions for developers to use. Common MVC frameworks include Jsp+Servlet+JavaBean pattern, Struts1, Struts2, Spring MVC, ASP.NET MVC, etc. Different MVC frameworks have different development efficiency, running performance and application scope, which provide more flexibility and adaptability for application design and development.

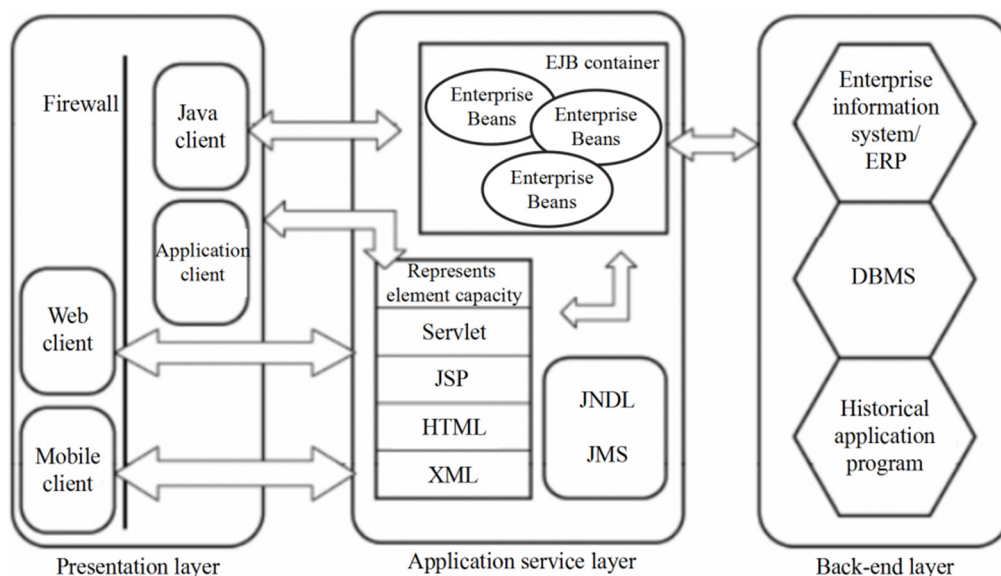
### 2.2. J2EE

J2EE is an architecture that uses Java 2 platform to simplify the development, deployment and management of enterprise solutions. J2EE is a new application development framework technology based on JavaSE, and it is also a set of specifications for Web Service, business objects, data access and news transmission in the process of application development [9]. As shown in Figure 2, it is a multi-tier distributed application model based on J2EE. Relying on this model, it can effectively reduce the pressure of applications in the running process and provide a comprehensive solution for large-scale application development at the enterprise level.

Under the J2EE presentation layer, it can support Web applications under B/S architecture and desktop applications under C/S architecture. In the application

service layer, J2EE contains a variety of key technologies that can complete the business logic processing of application programs. Among them, Java Servlets technology refers to a program that can expand the functions of the Web server, and can directly accept requests from the client, and generate responses to be returned to the user's client for display. JSP (JavaServer Page) is a mixture of HTML code and Java code. When a customer requests a page, the server will process the Java code and then return the HTML page to the browser. EJB is the abbreviation of (Enterprise Java Beans), and its specification defines three basic types of beans, including EntityBean, Session Bean and Message Driven Bean, all of which are under the responsibility of

EJB containers, and users can directly access EJB methods through various API interfaces. The main function of EJB is to complete the encapsulation of business logic, which greatly facilitates the whole call in the development process, and obviously reduces the development expansibility and the difficulty of designing and developing highly complex enterprise applications [2]. The back-end data layer is composed of databases to ensure the storage and call of system data information. The application of J2EE technology can provide necessary functional support for the development of Web applications, and it has obvious advantages such as strong scalability, stable usability, efficient development and easy maintenance.

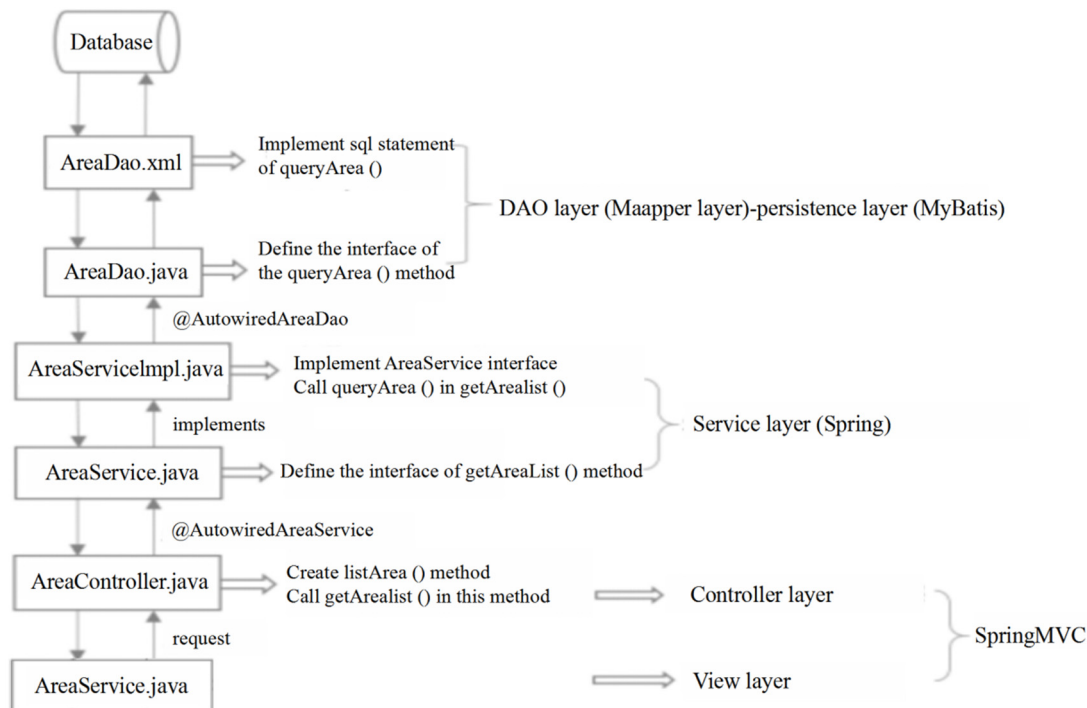


**Figure 2:** Distributed application model of J2EE

### 2.3. SSM framework

SSM is the abbreviation of Spring+ SpringMVC+ MyBatis. The overall framework set is the integration of Spring and MyBatis, which is the standard MVC application development mode. SSM framework is subordinate to J2EE development specification, which is suitable for the framework construction of Web projects with simple data sources. SSM framework divides the system into presentation layer, control layer, business layer and persistence layer. The relationship between the layers in SSM framework is shown in Figure 4, in which

Spring is applied to the business layer. It is a lightweight control inversion (IoC) and aspect-oriented (AOP) container framework, and usually uses basic JavaBean instead of the original EJB container to complete the corresponding business logic processing. SpringMVC acts on the presentation layer and the control layer, which represents the Model View Controller to receive, distribute and process external requests. Mybatis acts on the persistence layer and is a JDBC-based framework. It is mainly used to operate databases and connect business logic control entities with data tables [10].



**Figure 3:** Previous relationship of the layers in the SSM framework

## 2.4. Development environment

According to the system development requirements and the use requirements of the above key technologies, complete the configuration and deployment of the development environment. The overall development of the system is based on Windows 10.0 operating system, with Enterprise Edition as the version, Java as the basic development environment, 1.8.0\_131 as the development kit JDK, Apache Tomcat 8.5 as the Web server, Eclipse Java EE IDE for Web Developers Version: Neon.3 Release (4.6.3) as the Java integrated development tool, and MySql version 5.7 as the database. After the above software systems are installed and configured one by one, the system development environment is built.

The overall development of the system is divided into two parts. One is the front-end page design and development, which focuses on page presentation and art design. The key technologies involved are HTML, CSS and JavaScript, and there are many editing and development environments available, such as WebStorm, Sublime Text3 and Atom. The second is the design and development of the back-end server, including matching

the key functions of the system with the database system. Under Eclipse, Maven is used to complete the integration and construction of SSM framework. After setting up a new Webapp and adjusting Tomcat configuration, jar packages required by SSM framework are added, including Spring related packages, MyBatis related packages, MySQL related packages, log related packages and so on [5]. After that, add the configuration file for creating the project, and the key code is shown in Figure 5. Create mybatis-config.xml file, spring-mvc.xml file and spring-mybatis.xml file respectively to complete the integration and configuration of SSM framework of the system. Under the SSM framework, developers can complete the server-side design and development and the client-side design and development in turn according to the detailed system function requirements. Finally, they can use the code execution function under Maven attribute to observe whether the overall system design gives an error. Through the introduction of the above key technical theories, the overall environment of system development, the configuration of related software and tools are determined, and the technical feasibility of the overall project of social work information system in ethnic areas is also clarified.

```

<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/beans"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:context="http://www.springframework.org/schema/context"
xmlns:mvc="http://www.springframework.org/schema/mvc"
xsi:schemaLocation="
http://www.springframework.org/schema/beans
http://www.springframework.org/schema/beans/spring-beans.xsd
http://www.springframework.org/schema/context
http://www.springframework.org/schema/context/spring-context.xsd
http://www.springframework.org/schema/mvc
http://www.springframework.org/schema/mvc/spring-mvc.xsd">
<context:component-scan base-package="cn.temptation.*"/>
<mvc:annotation-driven />
<mvc:default-servlet-handler />
<bean id="viewResolver"
class="org.springframework.web.servlet.view.InternalResourceViewResolver">
<property name="prefix" value="/" />
<property name="suffix" value=".jsp" />
</bean>
</beans>

```

Figure 4: Key code for creating a spring-mvc.xml file

### 3. REQUIREMENTS ANALYSIS

#### 3.1. System requirements analysis

The information system of social work in ethnic areas takes the practical problems existing in current social work as the research object, integrates the practical needs of social workers, social service institutions and civil administration departments in ethnic areas, and takes convenient service and efficient management as the goal. It starts to realize the innovative reform of networking and informatization of social work in ethnic areas from the aspects of professional personnel training, service quality control, project process management and overall structure management.

The social work information system in ethnic areas has different application subsystems, namely, social worker subsystem, social work service organization subsystem, and civil administration subsystem, according to the rights distribution of different users. The system will support users with different roles to log in and use the system through corresponding accounts and passwords. Under the social worker subsystem, it supports social workers to apply for, register, re-register and change their professional level certificates, and also supports online learning of continuing teaching courses, as well as recording and statistical analysis of the implementation process of social work service projects.

Under the social work service agency subsystem, its main function is to manage the information and audit the operation of the social workers under this organization,

and to check the degree of completion of continuing study. It also includes comprehensive statistics and management of various social service projects completed or being carried out by this institution, and forwarding and transmitting relevant policies and notices to social workers.

Under the civil administration subsystem, it supports the examination, registration, issuance and management of social workers' professional level certificates. At the same time, it can count and manage all social work service agencies and all social workers in its jurisdiction. Finally, it also supports publishing the information of purchased social work service items, verifying the information of social work service items registered by social work service agencies in the region, and publishing notices and policies and regulations [3].

#### 3.2. Global design

The information system of social work in ethnic areas will adopt B/S architecture, under J2EE technical specification, based on JavaWeb application development technology, combined with SSM framework, to complete the overall design and development of the system according to MVC mode. SSM framework is a framework set that will be used in most software design processes, and it has become a common mode in modern J2EE development [1]. As shown in Figure 5, the overall architecture of the system is designed and divided by SSM framework, realizing the separation of data logic processing and business rule processing. The presentation layer is controlled by JSP



technology, JQuery class library and CSS hierarchical style, the control layer is realized by Spring MVC, the business service layer and object operation layer are

realized by Spring, and the object operation layer is realized by Mybatis.

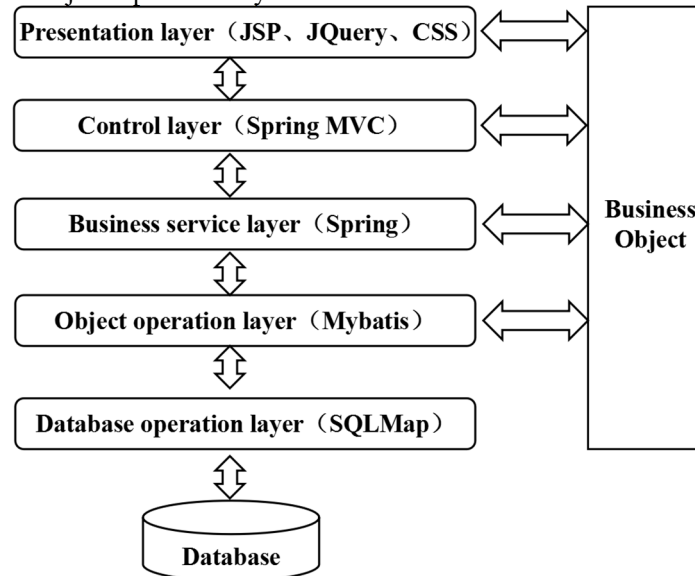


Figure 5: Overall architecture diagram of the system

## 4. DETAILED FUNCTION REALIZATION

### 4.1. Social worker subsystem

Social workers can open this system through any client browser connected to the Internet, and enter the personal account password to complete the system login. Under this system, there are functional modules such as personal information, certificate management, continuing education and service records. Among them, under the personal information module, social worker users need to fill in all contents of personal information according to the actual situation, such as household registration, marriage, educational background, professional level, service field, registration area, unit category, work history and personal honor. The integrity and authenticity of personal information are directly related to the application of social worker registration certificate. Users must fill in personal information, upload their recent photos and submit them for preservation after logging in for the first time. Under the certificate management module, social workers will apply for registration certificate after logging in the system for the first time. The system will automatically obtain the user's personal information, and upload it to the civil administration department of this jurisdiction, waiting for review. In addition, the registration period of social worker registration certificate is three years. Social worker users who have obtained the registration certificate will be re-registered under this module, and their personal information forms will be updated and added at the same time, especially their personal honor and work history. When the certificate is damaged or lost due to different reasons, social workers can change the certificate under this module and re-apply for a new

registration certificate. Under the continuing education module, social workers can choose online video courses in the form of online education according to the course catalogue to complete their learning tasks. After learning each part of the content, there are attached exercises to help users consolidate it in time. According to the completion degree of the course, the scoring standard is formulated to achieve the purpose of evaluating the learning effect of social workers. In addition, social workers can also feedback their needs, questions and thoughts in the process of study and work to the system in the form of words through the feedback function, which becomes the basis for follow-up work adjustment and practical development. Under the service record module, it is mainly used to record the social work projects that social workers participate in and the service content when they participate in social work projects. This part of data information will be synchronized with the social work service organization subsystem, which will facilitate the subsequent management and control of service projects.

### 4.2. Social work service agency subsystem

The user of this system is the administrator of social work service organization, and its main functional modules include social worker management, project management, comprehensive information management, etc. After the account registration is completed, the information form of social work organizations will be further improved, including basic information and social work service roles. The basic information requirements are true and accurate, especially the information in the field of party building and institutional services, which need to be focused on. The social work service role

mainly inputs the personal information of certified social workers who work in this institution. Under the social worker management module, the administrators of social work service organizations can obtain the personal information of their subordinate social workers through conditional retrieval. You can also review the changes proposed by social workers, and you can also conduct unified information collection and centralized deployment management for some social workers who have not obtained registration certificates. Under the project management module, the organization can view the project content, and know in advance what projects the government needs to buy and the bidding requirements of those projects are within the business scope of the organization. According to the requirements of related projects, the organization conducts bidding, and after successful bidding, the project information is entered into the system to complete the project registration. When the project is completed, the organization can upload the certification materials and publicize the project. Under the comprehensive information management module, the organization can obtain feedback from subordinate social workers, and can also feed back various problems or suggestions generated by the organization to the civil affairs department, and can also obtain various notices and announcements issued by the civil affairs department at a higher level. In addition, the organization can check the learning situation of subordinate social workers and urge them to complete their learning tasks in time, so as to improve the attention of professional talents training.

#### **4.3. Civil administration subsystem**

Under this system, administrators of civil administration departments will be able to complete five basic operations: social worker management, organization management, project management, continuing education management and comprehensive information management. Among them, social worker management includes preliminary registration, registration management, first registration management, re-registration management, undocumented social worker management, change management and so on. Organization management includes organization registration audit, organization details inquiry, organization registration feedback, etc. In terms of project management, the civil administration department will release various types of projects according to the actual needs of social work in ethnic areas, including information such as type, field, introduction, budget and requirements. Once the information is published, it will be automatically synchronized to the social work service subsystem. In addition, the administrator has the right to query, modify and delete the project, so as to improve the refinement of project management. Under the management of continuing education, the administrators of civil administration departments are responsible for

uploading and maintaining the content of online learning video courses, on the other hand, they can also score and review the learning effect of social workers according to the relevant scoring methods. Under the integrated information management function, administrators can respond to comments and suggestions put forward by social workers and institutions. It can also send and convey relevant notice announcements.

## **5. CONCLUSIONS**

The information system of social work in ethnic areas is a cross-level joint application solution to the specific problems of the implementation and development of social work in ethnic areas. The system covers three different user groups: social workers, social work service agencies and civil administration departments in ethnic areas. It fully takes into account the needs of practical work, and improves the process, standardization and specialization of social work in ethnic areas by means of networking and information technology, thus effectively improving the current development status of social work in ethnic areas. It not only makes an important contribution to promoting the harmonious and stable development of ethnic areas and maintaining national unity, but also provides a necessary innovative attempt to build a social governance pattern of "co-construction, co-governance and sharing".

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