

# Development of Key Technologies of Legal Case Management Information System Considering QoS Optimization

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**Abstract**— This paper conducts the development of the key technologies of the legal case management information system considering QoS optimization. The designed system administrator can carry out that the all-round management of the system, including account management, database management, security setting management, core data entry management, and data statistics management. With this help, the QoS optimization model is then integrated to improve the systematic performance of the system as the key technology. Similar to the layering in the data source, the data set is composed of the fields of the data set, and contains the relevant information of the attribute fields of various entity element categories. Furthermore, the designed system is analyzed and implemented on the public data sets to show the results.

**Keywords**— *QoS Optimization; Key Technologies; Legal Case Management; Information System*

## I. INTRODUCTION

The development of the system is inseparable from the support of the back-end database. Database design plays a very important role in system development [1, 2, 3, 4]. SQL Server is a relational database management system developed.

It has the advantages of integration with the Internet, scalability and availability, enterprise-level database functions, easy installation, deployment and use, etc. It also has XML support, user-defined functions and the new data types, index views, sorting rules, index enhancements, and the distribution Query, backup and restore features. System management, data backup, and the system security, are effectively guaranteed thereby realizing distributed storage and also then centralized management of spatial data. It can meet the needs of large-scale spatial database application system construction [5, 6].

At the same time, the core three-dimensional management information system will adopt three levels of metadata: data source, data set, and field-level metadata information. These three levels of metadata. The data source represents the data file or spatial database; and the data set constitutes the data source. Similar to the layering in the data source: the data set is composed of the fields of the data set, and contains the relevant information of the attribute fields of various entity element categories. Each level of metadata is stored in a flat structure, and each record in the flat structure is called a "metadata item\_metadata item has corresponding attributes to meet different needs [7, 8, 9, 10]. The attribute content of

different levels of metadata items has its own specialty. In the figure 1, the core framework is defined.

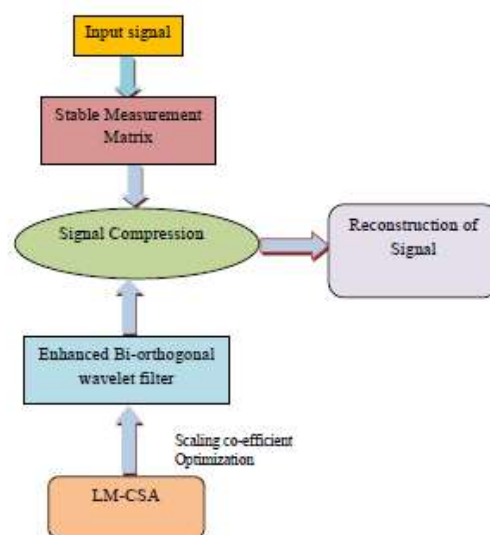


Fig. 1. The Management Information System Framework

The protection of copyright law obviously cannot satisfy the comprehensive protection of the software. There are blank areas in the scope of rights that software right holders should have. For example, the unique ideas and technical solutions embodied in software cannot obtain exclusive and exclusive rights. The purpose of constructing the legal knowledge base prototype system is to then explore the ontology knowledge representation ability and related reasoning functions, so as to construct an experimental platform that can be used in future research. For the convenience, the system uses a stand-alone program to connect to the database mode. In the next parts, the proposed model will be designed and simulated.

## II. THE PROPOSED METHODOLOGY

### A. The Management Information System Details

MES system is mainly composed of MES software, MES database server, general MES dispatching console, workshop information display screen, etc., which is connected by the industrial Ethernet with star topology; The network connection is concentrated on the central node, which is convenient for network maintenance and resource allocation. When a node in

the network fails, it is easy to isolate, detect and maintain, will not have a great impact on other nodes, and will not lead to the collapse of the whole network [11, 12, 13].

At the same time, the wiring mode of network nodes is also convenient for system monitoring and management.

$$H = \begin{bmatrix} H_{11} & H_{12} & \dots & H_{1m} \\ H_{21} & H_{22} & \dots & H_{2m} \\ \vdots & \vdots & \ddots & \vdots \\ H_{n1} & H_{n2} & \dots & H_{nm} \end{bmatrix} \quad (1)$$

In the equation 1, the calculation matrix is defined. In addition, role-based authority management makes the system's security mechanism very flexible. When defining a database role for each job in the organization, the role has the operating authority of the corresponding job, and then grant these roles to each user with that the job as needed, even if the authority corresponding to the job changes, it only needs to be simple Modify the permissions of the role without having to modify the permissions of each user of the job; or if the job of a user is then changed, it is only needed to reimburse the user's original role and re-grant the role corresponding to the new job. In the figure 2, the detailed topology is defined [14, 15].

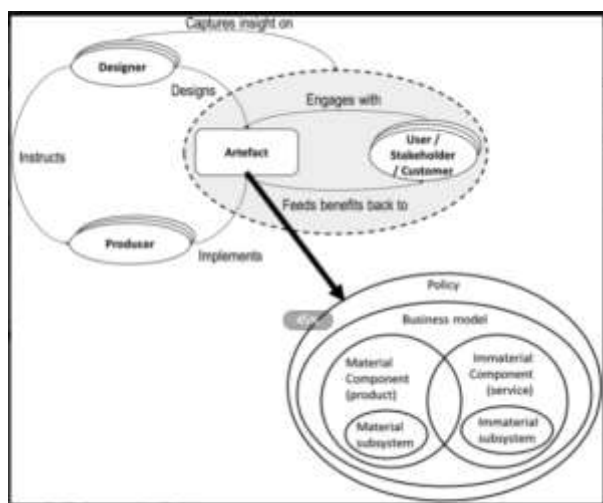


Fig. 2. The Detailed Topology of the Management Information System

The system administrator can carry out that the all-round management of the system, including account management, database management, security setting management, core data entry management, and data statistics management. Ordinary users: the branch can query and count all the information of the hospital; teachers can only query and the count their own information. The equipment condition monitoring sub-module communicates with the PLC terminal of the system control layer, and is used to monitor the running status of the main machine tools in the production system online [21-25].

Automatic alarm when the monitored equipment fails. The production process monitoring sub-module communicates with the Windows terminal of the monitoring layer to monitor the processing process of each task in the production system online. In the formula 2, the ideas are presented.

$$\hat{P}(e^{j\omega}) = \frac{1}{\sum_{i=p+1}^M E_i(z) E_i^*(z)} \Big|_{z=e^{j\omega}} \quad (2)$$

Use information technology to realize the management of the weighing system. On the basis of following the weighing management, optimize the decomposition process, transform from traditional human management to process management of the computer network mode, and form a set of universal, applicable and practical weighing management system. In the figure 3, the enhance structure is presented [16-20].

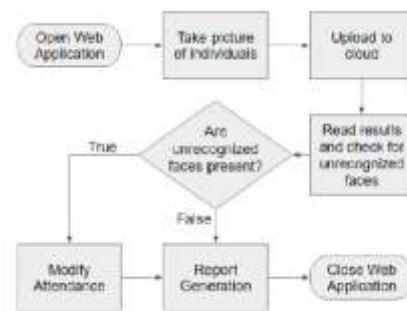


Fig. 3. The Enhanced System Structure

## B. The Key Technologies of Legal Case Management with Computer Sciences

A case-oriented computer-assisted legal analysis and the interpretation system can analyze and explain based on the existing legal knowledge in the system (including the legal provisions and cases and actual cases, and then put forward constructive legal suggestions or conclusions for the people's reference. Compared with the computer-assisted legal article query system, general computer-assisted legal analysis and interpretation system needs to use the legal knowledge to only reason, and is actually an expert consulting system.

Establishing a reasonable and effective legal knowledge expression method and reasoning mechanism is to construct a legal expert as the key to the counseling system is that this task is very difficult. The core of the application system is the OWL ontology model and rules [26-27].

The ontology model constructs the knowledge framework of the legal knowledge base, and the rules infer the results required by the core user based on this framework structure. Sharing is an important feature of the OWL ontology model. Since different users can develop different OWL ontology conceptual structures, these structures should be allowed to merge with fewer conflicts, so as to obtain a larger and more complete ontology knowledge base as follows.

$$\text{Minimize } F(\bar{x}) = \sum_{i=1}^n a_i f_i(\bar{x}), \quad a_i > 0, \quad i = 1, 2, \dots, n \quad (3)$$

$$\langle \phi_j(x), \tilde{\phi}_k(x) \rangle = \delta_{jk} = \begin{cases} 0, & j \neq k \\ 1, & j = k \end{cases} \quad (4)$$

The maintenance subsystem is provided to the knowledge engineers as a tool for acquiring, editing, and updating legal knowledge to facilitate the maintenance of the legal inquiry database and the legal knowledge base. The maintenance of the expert system can help it then grow rapidly, so that the knowledge is then constantly supplemented and refined, and it becomes more accurate and effective, so that the performance of expert consultation is getting higher and higher. In the figure 4, the structure is defined.

0 - 1<sup>st</sup> 2 MSB's - 00xxxxxx  
1 - 1<sup>st</sup> 2 MSB's - 01xxxxxx  
2 - 1<sup>st</sup> 2 MSB's - 10xxxxxx  
3 - 1<sup>st</sup> 2 MSB's - 11xxxxxx

Fig. 4. The General Structure Details

In the system, both reverse reasoning and also forward reasoning have been applied. Users may often need to reason about certain goals, but some of the variables have different values. These goals can be listed on the shortcut menu and use reverse reasoning to solve them. For goals that do not exist in the shortcut menu or that are not clear to the core user, only forward reasoning can be used to use the keywords entered by the user and the concept library of the system to then confirm which laws are related to the target, and then start from the basic facts and repeatedly ask the user until the user believes that the target has been found. In the figure 5, the enhanced structure is defined and implemented.

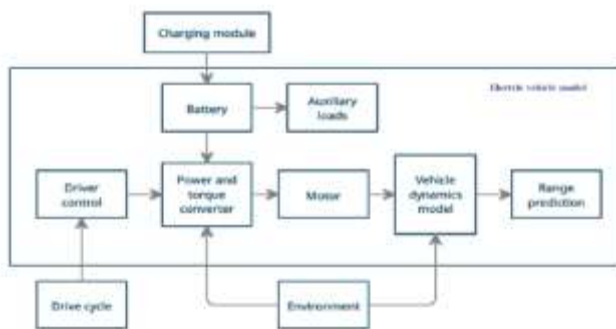


Fig. 5. The Enhanced Structure Model

### C. The Legal Case with QoS Intelligence

Priority of law, also known as superiority of the law or superiority of the law, means that the administration should be bound by the existing laws and must not take any measures that violate the law. Because the priority of law only requires that administrative actions do not contravene the law, and does not require all administrative actions to have a legal basis, it is a negative principle of administration according to law.

The principle of priority of law indicates that, except for the constitution, laws are superior to any other legal norms in effect, and the rank of law is higher than that of any other legal norms. Argument tree can also describe a core counter-argument of an argument. Since deductive arguments are not repealable, what needs to be constructed is a counter-argument that weakens an argument. This kind of counter-argument is an argument that attacks major or minor premises. Attacking

the major premises can point out that there are differences in the interpretation of the major premises, or that there may be exceptions to the rules expressed by the major premises, so as to show that the legal norms cited are inappropriate. Attacking the minor premise can point out that the facts of the case stated by the minor premise are controversial, thus showing that the facts cited by the minor premise are still uncertain. The deductive argument framework cannot express arguments that include practical reasoning and repealable reasoning, but it can then clearly express deductive argument and its counter-argument, and at the same time, it can avoid the deficiencies of the core repealable argument framework that prohibits the introduction of transpositional reasoning. In the next sections, the implementations will be conducted.

### III. THE SIMULATION

In the process of constructing legal argumentation, as the legal interpretation applied to the case is updated, the rules are constantly being revised, and also with the addition of new evidence, the legal facts of the case will also change, thus making the original legal conclusion the verdict was changed and even refuted. Therefore, legal reasoning is inherently non-monotonic, and legal reasoning based on legal reasoning is repealable.

This repeatability is embodied in that an argument can be defeated by a stronger argument, that is, through the premise, conclusion, or rebuttal of inference relationship continuously introduces new counterarguments, and thereby abolishing the original argument. In the figure 6, with the combination of the primary models, the performance is presented

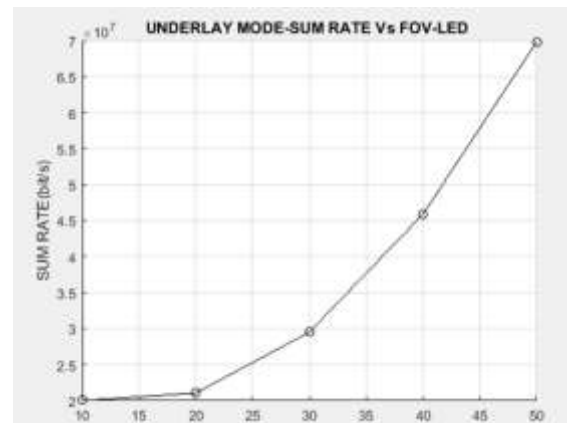


Fig. 6. The Systematic Performance of the Designed Model

### IV. CONCLUSION

This paper conduct development of the key technologies of the legal case management information system considering the QoS optimization. The system administrator can carry out that the all-round management of the system, including the account management, database management, general security setting management, core data entry management, and data statistics management. The designed methodology combines the novel structure of the data to process the general information and the experimental results have provided the solutions. In the future study, some novel application methods may be considered.

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