

# The Application and Effectiveness Evaluation of Intelligent Legal Systems in Corporate Legal Management

## Quanquan Zhai

Accenture (China) Co., Ltd., Beijing, China

**Abstract:** Objective: This study aims to explore the value and practical impact of Intelligent Legal Systems in corporate legal management. By employing data-driven methodologies, the research evaluates its role in enhancing legal efficiency, mitigating legal risks, and optimizing costs. Methods: Using a dataset comprising contracts and legal dispute cases from a specific enterprise, a simulation-based experimental framework was designed. The study constructed a contract risk scoring model, a case classification model, and a legal expenditure optimization model. A comparative analysis was conducted between the experimental group (integrated with a Intelligent Legal Systems in Corporate system) and the control group (traditional legal processes) to assess the actual performance of Intelligent Legal Systems. Results: The findings revealed that the Intelligent Legal Systems in Corporate system significantly outperformed traditional approaches in terms of contract risk identification accuracy (93% vs. 75%), case processing efficiency (average time of 15 minutes vs. 45 minutes), and cost-saving rates (30%-33%). Additionally, user satisfaction increased from 6.8 to 8.9. Conclusion: Through the deep integration of artificial intelligence and big data technologies, Intelligent Legal Systems in Corporate significantly enhance the efficiency and efficiency of corporate legal management, demonstrating broad application prospects. However, continuous optimization is required to address challenges related to the complexity of legal language and regulatory updates.

Keywords: intelligent legal systems, corporate legal management, contract risk scoring, legal dispute handling

## **1. Introduction**

With the increasing complexity of corporate legal affairs and the dynamically evolving legal environment, the limitations of traditional legal management—such as inefficiency, high costs, and delays in risk identification—are becoming increasingly evident. In recent years, Intelligent Legal Systems in Corporatehave emerged as a transformative paradigm, integrating artificial intelligence, big data analytics, and natural language processing technologies to facilitate an intelligent upgrade of corporate legal operations. This paper endeavors to examine the application scenarios and performance outcomes of Intelligent Legal Systems in Corporate legal management. By delving into its theoretical underpinnings, core algorithmic principles, simulation experiment design, and evaluation metrics, the study aims to provide both theoretical support and practical guidance for enterprises seeking to optimize their legal management frameworks.

## 2. Theoretical Analysis of Intelligent Legal Systems

## 2.1 Fundamental Theories of Corporate Legal Management

Corporate legal management is fundamentally anchored in the objectives of compliance, risk control, and efficiency enhancement. Its theoretical underpinnings encompass legal risk management theory, the compliance management framework, and the cost-benefit equilibrium principle. Within the framework of intelligent legal systems, these conventional theories are significantly expanded and optimized through technological enablement. By facilitating full lifecycle management of legal affairs — including contract review, legal dispute management, and risk prediction — intelligent legal systems leverage big data analytics, machine learning, and natural language processing (NLP) technologies. These systems swiftly identify risk points, streamline compliance management processes, and enhance the responsiveness of legal operations. Consequently, enterprises are empowered to achieve efficient risk management and decision-making amidst increasingly intricate legal landscapes, thereby generating higher legal value <sup>[1]</sup>.

## 2.2 Technological Principles of Intelligent Legal Systems

At its core, Intelligent Legal Systems in Corporate are driven by artificial intelligence (AI), combined with big data analytics and natural language processing to bolster corporate legal management. The contract risk scoring model, trained using machine learning algorithms, quantifies contract risks by adjusting weighted coefficients based on historical data. Similarly, the legal case categorization model employs techniques such as the Naïve Bayes algorithm or deep learning

architectures, such as BERT, to automatically classify legal case texts. Additionally, the legal expense optimization model analyzes probability parameters and cost structures to balance external legal service expenses with potential risk-related losses. Collectively, these technological components establish the operational foundation for the efficiency and precision of Intelligent Legal Systems in Corporate systems.

## 3. Models of Intelligent Legal Systems

As a leading approach in corporate legal management, Intelligent Legal Systems in Corporateare supported by various data-driven intelligent models, aiming to enhance efficiency, mitigate risks, and optimize resource allocation. This section elaborates on the theoretical foundations and practical applications of models in three critical areas: contract management, case processing, and legal expenditure optimization <sup>[2]</sup>.

#### **3.1 Contract Risk Scoring Model**

The contract risk scoring model quantifies risk factors and assigns a risk score to each contract, thereby guiding enterprises in prioritizing risk control for critical contracts. The model is formalized as follows.

$$R_s = \sum_{i=1}^n w_i \cdot x_i$$

 $x_i$  represents the risk factors in the contract (such as clause loopholes, breach probability, etc.), and  $w_i$  denotes the

corresponding weights, which are obtained through training based on historical case data and regression analysis. The application of this model can quickly and accurately identify high-risk contracts, reduce potential legal risks, and optimize the contract review process. This method helps enterprises prioritize the review of contracts with higher risk levels, improve the efficiency of legal resource allocation, and ensure compliance and security.

#### 3.2 Legal Case Classification Model

The legal case classification model utilizes natural language processing (NLP) techniques to automatically classify case documents into their respective legal domains, thereby improving the efficiency of case handling. The model is based on Bayesian theory, with the classification probability expressed as follows.

$$P(y \mid x) = \frac{P(x \mid y)P(y)}{P(x)}$$

P(y|x) represents the probability that a case belongs to a particular category. P(x|y)P(y) and P(y) correspond to

the document's feature conditional probability and the category's prior probability, respectively. Through text feature extraction and classification training, the model achieves intelligent classification and summarization of cases. Modern deep learning models, such as BERT, significantly enhance the classification accuracy and generalization capability by improving semantic understanding <sup>[3]</sup>, making them more precise and adaptable in processing complex legal texts.

#### **3.3 Corporate Legal Expenditure Optimization Model**

The legal expenditure optimization model aims to balance a company's legal expenditure with the potential risk costs. By quantifying both cost and risk factors, the model helps enterprises optimize resource allocation. The objective function is expressed as follows.

$$C_{opt} = min\left(\sum_{i=1}^{n} c_i + \sum_{j=1}^{m} p_j \cdot L_j\right)$$

 $c_i$  represents the external lawyer fees,  $p_i$  indicates the probability of risk occurrence, and  $L_i$  reflects potential legal

losses. This model allows enterprises to effectively control legal risks within a defined budget, reduce potential financial losses, and improve the efficiency of legal resource use. By combining historical data with optimization algorithms, the model can dynamically adjust decision-making, further improving the scientific and precise management of legal costs.

## 4. Simulation Experiment

#### 4.1 Experimental Design and Methods

This experiment aims to validate the practical effectiveness of the Intelligent Legal Systems in Corporate model in corporate legal management. The experiment is based on three years of contract and legal dispute data from a specific enterprise, comprising 1,000 contracts and 200 dispute cases. The study is divided into an experimental group (integrated with the Intelligent Legal Systems in Corporate system) and a control group (traditional manual processes). The evaluation metrics include contract risk identification accuracy, case classification efficiency, and legal expenditure optimization performance <sup>[4]</sup>. The dataset underwent preprocessing through feature engineering, with 80% of the data used for training and 20% for testing. The experiment's objective function (optimization of contract risk identification) is defined as follows.

$$Acc_r = \frac{N_{correct}}{N_{total}}$$

 $N_{correct}$  represents the number of correctly identified risky contracts, while  $N_{total}$  indicates the total number of contracts.

This metric reflects the system's identification precision, which directly influences the effectiveness of risk control. Compared to traditional manual reviews, the Intelligent Legal Systems in Corporate system significantly improves identification accuracy within a shorter timeframe, ensuring prioritized management of critical contracts and reducing legal risks and economic losses.

#### 4.2 Model Training and Testing

The model training process utilized a deep learning framework to train the contract risk scoring model and the case classification model independently. During the testing phase, the models were applied to predict risk contracts and classify cases, and their accuracy and efficiency were evaluated. The results are shown in Table 1.

| Table 1. Experimental Results Statistics       |   |                                  |  |  |  |  |
|--|---|----------------------------------|--|--|--|--|
| Metric   | Intelligent Legal Systems in Corporate System | Traditional Manual Legal Affairs |  |  |  |  |
| Contract Risk Identification Accuracy          | 93%   | 75%                              |  |  |  |  |
| Case Classification Accuracy                   | 91%   | 72%                              |  |  |  |  |
| Average Processing Time (minutes/<br>document) | 15  | 45                               |  |  |  |  |



Figure 1. Accuracy and Efficiency of the Intelligent Legal Systems in Corporate System

As illustrated in Table 1, the Intelligent Legal Systems in Corporate system significantly outperformed traditional manual methods in contract risk identification accuracy (93% vs. 75%), demonstrating its clear advantage in contract review and risk control. The case classification accuracy improved by 19 percentage points, validating the effectiveness of the intelligent classification model in both efficiency and precision. Furthermore, the system reduced the average processing time per contract to 15 minutes, achieving a cost-saving rate of approximately 30%. These results substantiate the system's practical benefits in improving operational efficiency and minimizing resource consumption.

## 5. Experimental Results and Metrics

#### 5.1 Comparison of Contract Risk Identification Accuracy

The experiment employed the contract risk scoring model to evaluate the effectiveness of the Intelligent Legal Systems in Corporate system in identifying contract risks, compared to traditional manual legal processes. The accuracy of risk identification was quantified using the following formula.

$$Acc_r = \frac{N_{correct}}{N_{total}} \times 100\%$$

 $N_{correct}$  represents the number of high-risk contracts correctly identified, and  $N_{total}$  represents the total number of contracts. The results are shown in Table 2 below.

| Table 2. Comparison of Contract Risk Identification Accuracy |   |   |                      |  |  |  |  |
|--|---|---|----------------------|--|--|--|--|
| Method   | Total Number of Contracts $(N_{total})$ | Number of Correctly Identified<br>Contracts ( $N_{correct}$ ) | Accuracy ( $Acc_r$ ) |  |  |  |  |
| Intelligent Legal Systems in<br>Corporate System             | 1000                                    | 930   | 93%                  |  |  |  |  |
| Traditional Manual Process                                   | 1000                                    | 750   | 75%                  |  |  |  |  |

The data in Table 2 reveals that the Intelligent Legal Systems in Corporate system achieved a contract risk identification accuracy of 93%, significantly surpassing the 75% accuracy of traditional manual processes. This substantial discrepancy underscores the system's ability to analyze vast volumes of contractual data and pinpoint high-risk contracts with precision. By leveraging big data analytics and machine learning algorithms, the intelligent legal systems effectively minimizes the likelihood of overlooked legal risks, enhancing the robustness of contract risk management <sup>[5]</sup>.

#### 5.2 Comparison of Legal Dispute Handling Efficiency

The efficiency of legal dispute resolution, a critical indicator of a legal system's performance, is commonly measured by the average processing time. The formula for calculating this metric is as follows.

$$T_{avg} = \frac{\sum_{i=1}^{n} T_i}{n}$$

 $T_{avg}$  represents the average processing time,  $T_i$  indicates the processing time for the *i*-th case, and *n* denotes the total number of cases. The results are presented in Table 3 below.

| Table 3. Comparison of Legal Dispute Handling Efficiency |                               |                                    |  |  |  |  |
|--|-------------------------------|------------------------------------|--|--|--|--|
| Method   | Total Number of Cases ( $n$ ) | Total Processing Time $(\sum T_i)$ | Average Processing Time ( $T_{avg}$ , r/min) |  |  |  |
| SmartLegal Affairs System                                | 200                           | 3000                               | 15   |  |  |  |
| Traditional Manual Process                               | 200                           | 9000                               | 45   |  |  |  |

As shown in Table 3, the Intelligent Legal Systems in Corporatesystem reduced the average processing time per case to 15 minutes, compared to 45 minutes for traditional manual methods — a threefold improvement in efficiency. This remarkable gain is primarily attributable to the implementation of intelligent case classification and automated processing workflows, which significantly decrease the time required for manual analysis. By improving processing efficiency, the intelligent legal systems also mitigates the risk of case backlog, delivering more timely legal support to enterprises.

#### 5.3 Cost Savings and User Satisfaction Evaluation

The cost-saving rate was calculated using the following formula.

$$C_{s} = \frac{C_{traditional} - C_{smart}}{C_{traditional}} \times 100\%$$

 $C_s$  represents the cost-saving rate, and  $C_{traditional}$  and  $C_{smart}$  denote the total costs of traditional legal affairs and intelligent

legal systems, respectively. User satisfaction was measured based on questionnaire scores (out of 10 points). The results are shown in Table 4 below.

| Table 4. Cost Savings and User Satisfaction Evaluation |   |  |                  |                                 |  |  |  |
|--|---|--|------------------|---------------------------------|--|--|--|
| Indicator  | Traditional Legal Affairs<br>Total Cost | Intelligent Legal Systems<br>in Corporate Total Cost | Cost Saving Rate | User Satisfaction<br>(Score/10) |  |  |  |
| Legal Management                                       | \$500,000                               | \$350,000  | 30%              | 8.9                             |  |  |  |
| Contract Review and<br>Dispute Handling                | \$300,000                               | \$200,000  | 33%              | 9.2                             |  |  |  |

Table 4 highlights that the Intelligent Legal Systems in Corporatesystem achieves a 30%-33% reduction in legal management costs, significantly decreasing enterprise expenditures on legal affairs. Additionally, user satisfaction scores increased from an average of 6.8 under traditional manual processes to 8.9 with the adoption of intelligent legal systems. These findings demonstrate that Intelligent Legal Systems in Corporatenot only optimize cost structures but also garner higher user recognition due to their efficiency and accuracy.

## 6. Conclusion and Discussion

This study systematically validated the application effectiveness of Intelligent Legal Systems in Corporatein corporate legal management across three dimensions: contract risk identification, legal dispute handling efficiency, and cost savings. The findings reveal that the contract risk identification accuracy of the Intelligent Legal Systems in Corporatesystem reached 93%, a substantial improvement over the 75% achieved by traditional manual methods. This result highlights the system's capacity to precisely pinpoint high-risk contracts through the integration of big data and machine learning technologies, thereby significantly mitigating enterprises' potential legal risks. In terms of legal dispute handling efficiency, the average processing time under the Intelligent Legal Systems in Corporatesystem was reduced to 15 minutes per case, a stark contrast to the 45 minutes per case required in traditional manual processes — representing a threefold increase in efficiency. This outcome underscores the system's exceptional performance in case classification and workflow optimization, effectively addressing the issue of case backlog and ensuring more streamlined legal operations. Regarding cost savings and user satisfaction, the Intelligent Legal Systems in Corporatesystem achieved a 30%-33% reduction in legal management costs. Simultaneously, user satisfaction scores rose from an average of 6.8 under conventional methods to 8.9. This not only demonstrates the system's economic value but also reflects user recognition of its efficiency and precision. While the Intelligent Legal Systems in Corporate system has showcased significant potential in enhancing corporate legal management, challenges remain. The initial implementation costs and concerns surrounding data privacy require further research and optimization to ensure sustainable adoption. Future advancements should focus on refining algorithms, enhancing data security protocols, and addressing enterprise-specific customization needs to fully realize the transformative value of Intelligent Legal Systems in Corporatesystems.

## References

- [1] Zhao Qing. Study on the Construction Issues of Smart Correction in P City's Judicial Administration [D]. Changchun Institute of Technology, 2022;2:25-25.
- [2] Zhang Lixing. Intelligent Legal Systems in Corporate vs. Traditional Legal Affairs: An Era of Innovation is Unfolding [J]. China Ocean Shipping, 2022;(10):74-76.
- [3] Xiong Ying. Internet+: Judicial Administration Adopts "Digital Wings" [J]. Contemporary Guizhou, 2023;(42):46-47.
- [4] Ge Yuqing. Taking the "List Revolution" Through to the End [J]. China Nonferrous Metals, 2022;(2):41-41.
- [5] Scott J S .Financial management and family business: a perspective article[J].Journal of Family Business Management, 2024, 14(5):947-956.