

Publication Date: 10 August 2024

Archs Sci. (2024) Volume 74, Issue S1 Pages 120-125, Paper ID 2024s117.
<https://doi.org/10.62227/as/74s117>

The Legal Construction of China's Civil Service using Data Fusion from the Perspective of Administrative Law and Reflections

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Abstract The construction of civil service legal system is an important element of civil service management, and strengthening the construction of civil service legal system is an objective requirement for maintaining the advanced nature of the Party. It is a practical need to consolidate the party's ruling base, is the problem of style itself stubborn and recurring requirements. It is the key to cope with the complex international competition and build a moderately prosperous society. In the new era, China's civil service legal system construction mainly takes measures in three aspects: First, strengthen the ideological education and lay a firm ideological foundation for the construction of the civil service legal system. The second is to improve the institutional mechanism to ensure the standard operation of the civil service legal construction of the fundamental; third is to strengthen supervision and inspection to ensure that the civil service legal construction of the key to achieve effective results. Based on this, this paper considers the strategies and directions of the legal construction of civil service based on data fusion under the perspective of administrative law, and combines case studies to demonstrate the effectiveness and superiority of the proposed scheme.

Index Terms civil servants, legal system construction, data integration, administrative law perspective

I. Introduction

Since the 18th Party Congress, the construction of the legal system has received unprecedented attention, our party rectification of the legal system "to leave a mark, grasp the iron", anti-corruption "no target, no ceiling", with a resolute attitude of zero tolerance, so that the legal system of China's civil service has made a series of achievements [1]. "Six provincial and ministerial-level cadres fell in one month, and 10.9 million people were investigated and punished for violating the spirit of the eight provisions", from controlling the hordes of food and drink to rectifying the chaos of clubs, from opposing the meeting to improving the window legal system. From the means of punishment must not be relaxed to iron discipline must be implemented, from the focus on the strict management of cadres to hold the key to the main responsibility and supervision responsibilities [2], [3]. There are some people in our civil service who are not liberated in their mindset. Every word and deed of civil servants is related to the stability of social order, because they hold important powers in their hands and bear the responsibility of providing government services to the general public. "All those who have power are prone to abuse it, and this is a lesson that is not easy to learn for all time. People who have the power to

use it have always encountered a boundary before resting", whether civil servants can manage public affairs scientifically and rationally and properly exercise the power in their own hands is inextricably linked to their own legal literacy [4]. The formation of a good legal culture in the whole society also requires the establishment of a team of civil servants with integrity. For the traditional, archaic and single personnel system, our current civil service system is more advanced, flexible and comprehensive, and the structure of the entire civil service talent team is quite scientific. Good institution building, especially legal system building, can effectively restrain the exercise of public power by civil servants on the one hand; on the other hand, the scientific and advanced management [5].

The personal legal cultivation of civil servants is the top priority of public administration [6]. Although public administration has the role of regulating and restraining the behavior of civil servants, it is far from enough to eliminate the phenomenon of abuse of power by civil servants by relying on such means [7]. To realize the integration of public management and civil service legal system, we must first establish a sound civil service legal system and introduce supporting laws. At the present stage, many civil servants in China have

made some acts against the legal system, such as malfeasance and abuse of law, using power for personal gain, misappropriation of public funds, accepting bribes, trading in power and sex, low political ability, lack of responsibility, etc [8], [9]. The reason for this is not only the deviation of individual thoughts and the impact of money worship, but also the unsoundness of the relevant system [10]. Many scholars in China are aware of the significance of studying the institutionalization of the civil service legal system, and have also made a lot of research results, but this, after all, only remains in the theoretical stage, and has not yet formed a sound system of legal norms for civil servants nationwide, coupled with the lack of effective legal education channels, the institutionalization of the civil service legal system in China is slow to develop.

Therefore, to improve the legal literacy of civil servants in an all-round way from the perspective of administrative law, and to strive to build and improve the legal system of civil servants, to enhance the trust of the government, and improve the overall legal level of the society, as well as a mechanism to guarantee the construction of a socialist harmonious society in China. It is believed that as the reform of China's political system continues to progress, all departments at all levels will actively participate in the great cause of institutionalizing the civil service legal system.

II. Methods

The construction of the institutionalization of the civil service legal system, and has invested a lot of human, material and financial resources. Since the state has given the power to provide public services for the people to civil servants, civil servants must take the fundamental interests of the state and the people as the starting point in everything, properly exercise the power in their hands and consciously resist the corrosion of bad ideas. However, in practice, influenced by many factors, many civil servants are inevitably tempted by both interests and discretionary power to do something [11], [12]. The abuse of power by civil servants, private authority, the sale of official positions, and the use of power for personal gain not only damage the image of our party and government, but also cause serious infringement on the interests of the state and the people. The fundamental reason behind the phenomenon of all kinds of legal misalignment of civil servants lies in the low level of institutionalization of the civil service legal system in China, and the institutionalization construction is not yet perfect [13]. Legislation is the top priority for the institutionalization of civil service legal system. According to the statistics of civil service legal system research, China has introduced more than thirty pieces of legislation and administrative regulations on civil service legal system construction since the 14th National Congress, and thousands of regional and departmental rules and regulations have been introduced all over the country. Nevertheless, compared with some western countries, the legal construction of civil servants in China is lagging behind and growing slowly, and there are obvious shortcomings. First of all, from the viewpoint of the content of the legal system construction, China has not set up a special code in the field

of civil service legal system [14], [15]. Secondly, from the viewpoint of the main body of legal construction, the role of China's legislature in the process of institutionalizing the civil service legal system is weak, making it difficult to make a breakthrough in the construction of the civil service legal system. Again, from the viewpoint of the legal construction process, the legal construction activities of civil servants are lagging behind and uncoordinated, making it difficult to form a closely structured and effective legal system. Based on this, this paper proposes a data fusion-based algorithm for selecting the legal construction strategy of civil service team.

In the traditional data synthesis algorithm, the data integration model is easy to understand and is defined as follows: if each node has the same capture sensitivity and each common node is running, the weighted average algorithm gives the following method.

$$\bar{X} = \frac{\sum_{j=1}^n X_i^j}{n}. \tag{1}$$

Therefore, the optimal weighting algorithm can be adopted: assign weighting factors 1, 2 and 3 to each of the three nodes, and integrate all weighting factor nodes into the data integration center. The overall model of the algorithm is shown in Figure 1. In the process of integrating data into the weighted value algorithm, the weight distribution is of great significance. The minimum deviation method is used to achieve the optimal distribution of weights under the optimal conditions, so as to minimize the overall average error. Assuming the actual value is t , then

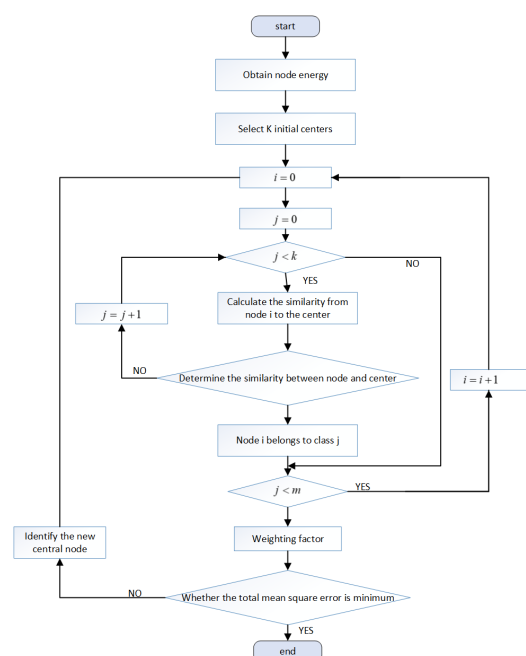


Figure 1: Flow chart of optimal weight data algorithm

$$\hat{T} = \sum_{j=1}^n W_j T_j, \tag{2}$$

where \hat{T} is the estimated value; W_j is the weight of the j th node, $j = 1, 2 \dots, n$, $\sum_{j=1}^n W_j = 1$; T_j is the monitoring data of the j -th node.

$$\sigma^2 = \exp(T - \hat{T})^2. \tag{3}$$

$$\sigma^2 = \exp \left[\sum_{j=1}^n (T - \hat{T})^2 + 2 \sum_{j=1, i=1}^n W_j W_i (T - T_j) \right]. \tag{4}$$

The constraint on the mean variance is

$$\sum_{j=1}^n W_j = 1. \tag{5}$$

According to the Lagrange's law, the law is obtained as

$$F(W_1, W_2, \dots, W_n, \lambda) = \sum_{j=1, i=1}^n W_j \sigma_i^2 - \lambda \left(\sum_{i=1}^n W_i - 1 \right). \tag{6}$$

$$\partial_{\min^2} = \frac{1}{\sum_{j=1}^n \sigma_j^{-2}}. \tag{7}$$

The paper is a fusion of the results obtained from different sensors or methods to make optimal decisions based on certain criteria and the confidence of the decision, so that the correct judgment can still be made when certain methods fail, and thus improve the decision accuracy, so it belongs to the decision-level fusion technique, which uses the idea of finding the main cause of the event to derive the probability assignment of different hypotheses, called the mass function. Based on the above methods, the mass function derived from traditional methods is mainly based on subjective judgments and is an empirical function. To improve the accuracy of the function, it can also be combined with some quantitative methods so as to obtain a more objective function to calculate the fusion probability. When the probability of an event occurring is maximum, that corresponding event is the verdict. The basic trustworthiness of each proposition is first assigned, and the basic trust functions of multiple sources are fused using fusion rules to obtain a new basic trust assignment function reflecting the fused information, and decisions are made accordingly. The steps to construct the algorithmic model are as follows.

For the legal event data detected by feature change, the data are fused using an evidence theory-based fusion algorithm to obtain the legal event set. The algorithm fusion is performed by evidence theory, whose proposition is to tell civil servants whether an event occurs, A_1 indicating an event occurs and $1 - A_2$ indicating no event occurs, using violation algorithm event

table A, violation event table B and disciplinary event table c data as evidence.

In evidence theory, a sample space is called a discriminative frame and is denoted by @.

The power set formed by all subsets in @ is denoted as 2^θ , and when the element in @ is 4, the number of power sets is 2^N . The representation of the power set in this algorithm is shown in Eq. (8).

$$2^\theta = \{ \{ \phi \}, \{ A_1 \}, \{ A_2 \}, \{ A_1, A_2 \} \}. \tag{8}$$

When data from the Violation Algorithm Event Table, the Violation Event Table, and the Disciplinary Event Table are fused, the following are required for a particular event. 1) A has this event, B has this event, c has this event. 2) A has this event, B has this event, c does not have this event. 3) A has this event, B does not have this event, c has this event. 4) A has this event, B does not have this event, C does not have this event. 5) A has this event, B has this event, c has this event. 6) A has this event, B has this event, C has this event. 7) A has this event, B has this event, c has this event. 8) A has this event, B has this event, c has this event. 9) A has this event, B has this event, c has this event. 10) A has this event, B has this event, c has this event. 11) A has this event, B has this event, c has this event.

The basic credibility of these 3 types of evidence is assigned to obtain the trust function before performing the fusion, and then the new trust function is obtained by using Dempster's synthesis rule, and then the decision is made according to the decision rule to determine whether a legal event has occurred, and the final decision is derived.

Before the fusion algorithm proceeds it is necessary to assign the basic trustworthiness of proposition 4, and to the three sources of trust, violation algorithm, violation and discipline. The commonly used methods for basic confidence assignment are as follows.

- 1) Determining the trust function based on the number of target types and environmental weighting coefficients.
- 2) Obtaining basic confidence assignment using statistical evidence.
- 3) Obtaining basic confidence assignment using target velocity and acceleration.
- 4) Obtaining basic confidence assignment using target identity.

Combining the actual data of this paper and the characteristics of event detection, the second method, i.e., the method of using statistical data to obtain the basic trustworthiness assignment. The specific method is shown in Table 1.

Matching the event data of disciplinary structured data, millimeter wave violation event data and event data derived from the violation algorithm with the real event table, the basic trustworthiness is assigned to obtain the basic trustworthiness assignment table.

The trust function of the combination is calculated based on the basic trustworthiness assignment table. When fusing the event information, due to the large amount of data, the

Basic credibility assignment	Source A Source B Source C/A ₁	Source A Source B Source C/A ₂
$m(A_1)$ The total number of events detected and actually occurred by the algorithm	The number of events not detected but actually occurred the algorithm detects the number of no events	
$m(A_2)$ Total number of events detected by the algorithm	The number of events not detected and not actually occurred.The algorithm detects the number of no events	

Table 1: Basic plausibility assignment methods

increase in the number of evidence may lead to a very large computational effort, so a two-by-two fusion method is used for fusing multiple evidence, and then the fusion of multiple evidence is completed recursively according to this method. The probability distribution function of 2 of the algorithms is fused using the synthesis rule, which is shown in (9).

$$m_{A,B}(A) = \left\{ \begin{array}{l} \frac{\sum_{A_i \cap B_j = A} m_1(A_i) \times m_2(B_j)}{1-K}, A \neq \phi \\ 0, A = \phi. \end{array} \right\} \quad (9)$$

$$K = \sum_{A \cap B_j = \phi} m_1(A_i) \times m_2(B_j), \quad (10)$$

where $K = \sum A_i$. The calculation procedure is shown in Table 2.

$m_B(\emptyset)$	$m_B(A_1)$	$m_B(A_2)$	$m_B(\Theta)$
$m_A(A_1)$	$m_{A,B}(A_1)$	K	$m_{A,B}(A_1)$
$m_A(A_2)$	K	$m_{A,B}(A_2)$	$m_{A,B}(A_2)$

Table 2: Combination Rules

According to the calculation method in Table 2, the trust function is fused for the three sources of data, and the new trust function is obtained after fusion $m(A_1)$ $m(A_2)$ and $m(\Theta)$.

After multiple decisions are synthesized to obtain a new trust function, a final decision rule is selected to make a decision to obtain the event set. Common decision methods based on evidence theory include: trust function-based decision making, basic confidence assignment-based decision making, and minimal risk-based decision making. The paper uses the trust function-based decision making method.

The decision method requires the determination of ε_1 and ε_2 values for the actual application problem, and different combinations of thresholds are likely to yield different decision results, which in turn have an impact on the decision outcome.

The $m(A_1)$ $m(A_2)$ and $m(\Theta)$ derived from the rule fusion part is brought into Eq. (5) to obtain the decision table, and according to the results of each combination of the decision table against the event data calculated from the illegal event data, the disciplinary event data and the violation algorithm, the combination to which the event data belongs is judged, and the decision is made according to the results of the combination, and the event set is output.

III. Case Study

Under the new situation, strengthening the construction of civil service legal system becomes more urgent and necessary

because: Our civil servants will not only be subject to the erosion of Western hostile forces, but also to the negative impact of the duality of the market economy, which makes some of them weak-willed to breed bad legal system, the market economy society is a society with highly differentiated interests, but also a society in which the demands of particularity get fully expressed, such a society in which individuals are separated from the traditional community and become independent to seek their special interests "In such a society, the individual is separated from the traditional community and becomes an independent "private person" seeking his or her special interests.

From the perspective of the external environment, the process of international society and economic globalization has made the competition for talents around the world increasingly fierce. Different countries and interest groups have adopted different means to attract talents, which is a test of the intelligence and political quality of our civil servants. At the same time, the reshaping of the world economy requires a higher level of physical condition, intellectual thinking and cultural skills in all aspects of human resource quality. In the face of the complex international situation, our civil servants should not only have a firm and correct political orientation, but also have a clear, honest, effective legal system and a high degree of cultural background. Only in this way can we prevent the erosion of anti-corruption ideas from abroad and improve the combat effectiveness of the civil servants themselves. At present, China is in an important strategic opportunity period to build a moderately prosperous society in all respects. A good legal system is combat effectiveness, motivation and cohesion. In this way, the legal status of civil servants will directly affect the process and effectiveness. First, the advantages of the algorithm are studied. Table 3 shows the number of nodes and error rate of the optimal weight algorithm. After the algorithm is executed, the manifold can be divided. The results of these two experiments are shown in Table 4.

Number of nodes	20	30	40	50	60
Error rate/%	1.3	2.0	3.1	4.5	5.4

Table 3: Optimal weight assignment algorithm

Number of nodes	10	20	30	40	50	60
Time required for optimal weight allocation algorithm/ms	30	78	78	98	130	155
Time required for centralization/ms	31	61	110	122	166	198

Table 4: Time required for optimal weight assignment algorithm and centralized algorithm

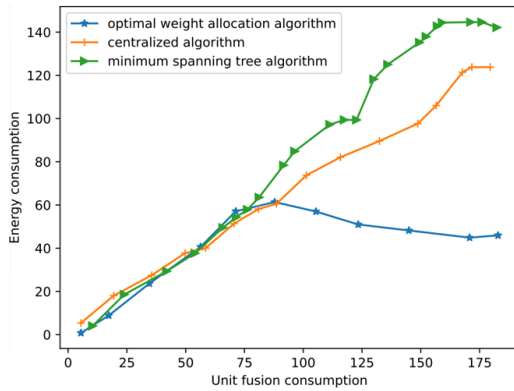


Figure 2: Comparison of the total energy consumption of the algorithms

In addition, the data integration process will also affect the cost of the algorithm. Assume that the effective communication radius of the node is 30 meters, and the corresponding radius is 50 meters. The minimum tree generation algorithm, the optimal weight allocation algorithm and the centralized algorithm are used to simulate the experiment. The figure shows three algorithms used to calculate communication and integration costs. Figure 2 compares the total energy consumption of the three algorithms, and Figure 3 compares the data integration costs of the three algorithms. Obviously, the minimum tree algorithm and the optimal weight allocation algorithm can achieve a higher degree of data integration when the element integration cost is minimal, because both methods can eliminate data redundancy at a lower integration cost. In the implementation of minimum tree generation algorithm and centralized algorithm, each node needs to participate in data integration, so the communication power consumption is close to a single constant. In the implementation process, each node of the optimal weight allocation algorithm directly participates in data integration, resulting in a sharp increase in data integration costs. In the weight optimization algorithm, due to the high cost of data integration, some nodes cannot be integrated into the data. Therefore, the main difference between the optimal allocation algorithm and the other two algorithms is that the energy consumption decreases with the increase of data integration cost.

Then the communication of the cell area network is explored, i.e., the average delay of the communication between the smart terminals and their corresponding MEC servers. It can be noted that the aggregator utilization is an important parameter to be considered when deploying the smart grid. Figure 4 shows the average latency for different aggregation percentages. Finally, the fusion networking approach of the algorithm in this paper is compared with the traditional approach. Table 5 shows the comparison of the communication success rate for different number of nodes. It can be clearly seen that the fusion networking method of this algorithm has better performance.

Figure 5 shows the changes in satisfaction with the legal

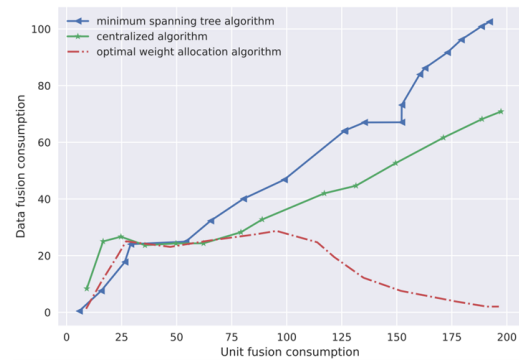


Figure 3: Comparison of data fusion consumption of different algorithms

Number of nodes	Success rate of networking algorithm communication in this paper /%	Communication success rate of traditional algorithm /%
50	100.00	100.00
100	100.00	100.00
150	100.00	99.50
200	100.00	98.50
250	100.00	97.00

Table 5: Comparison of communication success rates

system construction before and after the application of this strategy in different integration scenarios. It can be seen that this strategy can effectively improve the satisfaction of the legal system construction of the civil service.

IV. Conclusion

For the construction of civil servants' legal system in China, although the government administration is paying more and more attention to it, and actively formulating various laws and regulations, and never relaxing the legal education for civil servants, however, there is still a lack of a strong operation of civil servants' legal system to promote the smooth development of civil servants' legal legislation, supervision, education and punishment. Therefore, once civil servants abuse their power in the specific work process, or there are cases of non-compliance with regulations and violation of the legal system in the work process, it is difficult to supervise them in time and

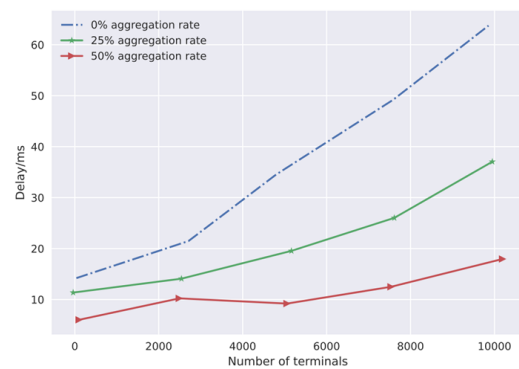


Figure 4: Average Delay of Intelligent Terminal and MEC Server under Different Aggregation Percentage

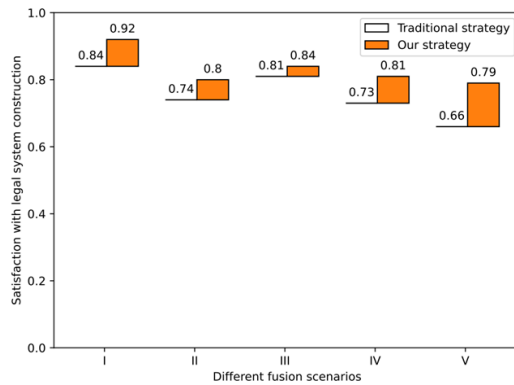


Figure 5: Satisfaction with the legal system construction

to curb or punish their improper behaviors. The strategies and suggestions in this paper can effectively solve this problem and have implications for related research.

References

- [1] Timofeev, I. N. (2022). Britain's sanctions policy: Institutional design and targeting Russia. *Herald of the Russian Academy of Sciences*, 92(Suppl 6), S504-S511.
- [2] Motahari, M. R., Amini, O., Iraj, A., Mahdizadeh Gohari, O., & Saffarian, M. (2022). Comparison of dynamic and static properties of sandstone and estimation of shear wave velocity and Poisson's ratio. *Bulletin of Engineering Geology and the Environment*, 81(9), 1-24.
- [3] Jørgensen, A., & Fallov, M. A. (2022). Urbanization and the organization of territorial cohesion – Results from a comparative Danish case-study on territorial inequality and social cohesion. *Journal of Organizational Ethnography*, 11(1), 64-78.
- [4] Mouttotos, N. (2022). Control of unfair terms under Cypriot contract law. *Liverpool Law Review*, 43(2), 311-338.
- [5] Chouaibi, J., Rossi, M., & Abdessamed, N. (2022). The effect of corporate social responsibility practices on tax avoidance: An empirical study in the French context. *Competitiveness Review: An International Business Journal*, 32(3), 326-349.
- [6] Nukusheva, A., Zhamiyeva, R., Shestak, V., & Rustembekova, D. (2021). Formation of a legislative framework in the field of combating cybercrime and strategic directions of its development. *Security Journal*, 35(3), 893-912.
- [7] Rusakova, E. P. (2023). The application of artificial intelligence in the civil proceedings of the People's Republic of China: Theoretical and legal analysis. *RUDN Journal of Law*, 27(2), 468-480.
- [8] Yao, L. (2023). Implementing Rule of Law Concept in the Digital Sphere: China's Experience. *Legal Issues in the Digital Age*, 4, 114-133.
- [9] Lee, J. W. C. (2023). Anti-Corruption in a Party-State: Constitutional Implications of China's Supervisory Reform. *Asian Journal of Comparative Law*, 18(3), 389-406.
- [10] Sweet, A. S., Bu, C., & Zhuo, D. (2023). Breaching the Taboo? Constitutional dimensions of the new Chinese Civil Code. *Asian Journal of Comparative Law*, 18(3), 319-344.
- [11] Ai, H., & Philipsen, N. J. (2023). A critical reflection on the 'Public Interest Exemption' in China's merger control regime. *Journal of Antitrust Enforcement*, 11(3), 491-508.
- [12] Zhang, X., Wang, W., Yu, W., Shen, D., & Zhang, T. (2023). River Chief Information-Sharing System as a River Information Governance Approach in China. *Sustainability*, 15(8), 6504.
- [13] Zhongyuan, W., Woo, S. Y., & Kübler, D. (2024). The emerging big data ecosystem and digital transformation of poverty governance in China. *Social Sciences in China*, 45(2), 152-183.
- [14] Wang, M., & Zhang, Z. (2023). Rule of Law history and development in China: In comparison to Australia. *Journal of Social Science Studies*, 10(2), 27-27.
- [15] Li, J., Cai, X., & Cheng, L. (2023). Legal regulation of generative AI: A multidimensional construction. *International Journal of Legal Discourse*, 8(2), 365-388.