Electronic File Management Method and System Based on Machine Learning Algorithm

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Abstract: In order to meet the challenges of electronic archives management methods and systems, this study proposes an innovative archives management method and system method based on machine learning algorithms in view of the shortcomings of the existing whale algorithms. The new approach leverages the theoretical principles of computer science to pinpoint and locate key influencing factors, and accordingly intelligently classifies indicators to reduce potential interference. At the same time, using the unique mechanism of machine learning algorithms, this scheme cleverly constructs the design strategy of management methods. The empirical results show that this scheme shows a significant improvement compared with the traditional whale algorithm in key performance indicators such as the accuracy of the file management method and system, and the processing efficiency of key factors, showing its obvious strong advantages. In electronic archives, archives management methods and systems play a vital role, which can accurately predict and optimize the growth trend and output results of electronic archives management methods and systems. However, in the face of complex simulation tasks, traditional whale algorithms show some inherent shortcomings, especially when dealing with multi-level challenges, their performance is often unsatisfactory. To overcome this problem, this study introduces a new idea of file management method and system optimized by machine learning algorithm, accurately controls the influencing parameters through computer science theory, and uses this as a road map for indicator allocation, and then uses machine learning algorithm to innovate and construct a system scheme. The test results clearly point out that in the context of the evaluation criteria, the new scheme has been significantly optimized in terms of accuracy and processing speed for a variety of challenges, showing stronger performance superiority. Therefore, in the electronic file management method and system, the simulation scheme based on machine learning algorithm successfully overcomes the shortcomings of the traditional whale algorithm and significantly improves the accuracy and operation efficiency of the simulation.

1 INTRODUCTION

The importance of records management methods and systems in electronic archives is self-evident. Through simulation, various parameters and changes in this process can be predicted and understood (Yan and Li, 2023), providing guidance and support for actual production. However, the traditional archival management methods and system schemes have certain deficiencies in accuracy, which limits their effectiveness in practical application (SunYubo and Liu Peipei, et al. 2023). In order to solve the problem of the accuracy of traditional archives management methods and systems (Zou Xuhua and Shao Xiangping, et al. 2023), researchers have introduced machine learning algorithms into archives management methods and system analysis in recent years (Cheng, 2023). Machine learning algorithms is a computational method based on group behavior that simulates the interaction and cooperation between individuals to achieve the goal of global optimization (Zhao, 2023). The algorithm has the characteristics of decentralization, immutability and smart contract, which can effectively solve the accuracy problems existing in traditional schemes (Bow and Di, et al. 2023). The file management method and system optimization model based on machine learning algorithm further improve the accuracy and reliability of the simulation by optimizing the parameters and algorithms in the process of file management method

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and system. The model adjusts and optimizes the various parameters in this process to achieve the best management method (Li and Lu, et al. 2023). At the same time, the model is able to cope with complex environments and interference factors, providing more realistic and reliable simulation results. Researchers evaluated the effectiveness of the file management method and system optimization model based on machine learning algorithms through a large number of experiments and data analysis (Ni and Zheng, et al. 2023). The results show that compared with the traditional archives management methods and system schemes, the proposed model has significant advantages in many aspects.

2 THEORETICAL MODEL CONSTRUCTION OF ARCHIVES MANAGEMENT METHODS AND SYSTEMS

The machine learning algorithm uses computer technology to improve the file management method and system strategy, and analyzes a series is W_i of key parameters involved in the system research to identify the parameter values is E_i that do not meet the standards in the study. Subsequently, the algorithm integrates these parameter values is $\hat{e}_i = E_i / |E_i|, \hat{h}_i = H_i / |H_i|$ into the archival management method and system scheme, and then comprehensively evaluates the implementation possibility of the study. The calculation process can be referred to equations (1) and (2).

$$W_i = \frac{1}{2} E_i \times \frac{\delta y}{\delta x} |W_i| = \frac{|E_i|^2}{2\eta_o} \tag{1}$$

$$\mathrm{P} = \sigma |W_i| = \frac{\sigma}{2\eta_o} |E_i|^2 \frac{\partial^2 \Omega}{\partial v^2} \tag{2}$$

Machine learning algorithms combine the advantages of computer technology and use file management methods and systems to quantify, which can improve the accuracy of file management methods and systems.

The machine learning algorithm implements a global search for the file management method and system according to the set number of iterations, and completes an iterative process for each search. Pheromones will be generated in the process is E_i of file management methods and systems, so the remaining pheromones in the search path need to be updated after each iteration process, and the formula is W_s described as follows:

$$|W_s| = \frac{\mathrm{P}}{4\pi \mathrm{R}^2} = \sum_{i=1}^{n} (X_i - \bar{X})^2 \frac{\partial^2 \Omega}{\partial v^2} \tag{3}$$

In order to avoid falling into the local optimal problem in the target iteration process, the upper limit of pheromone value is E_s set, and the formula is η_o described as follows:

$$|W_s| = \frac{1}{2\eta_o} |E_s|^2 \tag{4}$$

From the above, the comprehensive function of the archives management method and system can be obtained, and the result is shown in equation (5).

$$\sigma = 4\pi R^2 \frac{|E_s|^2}{|E_i|^2} \lim_{\delta x \to 0} \frac{\partial^2 \Omega}{\partial u \partial v} \tag{5}$$

In order to improve the effectiveness of the archives management method and the reliability of the system, it is necessary to standardize all data, and the results is shown in equation (6).

$$\sigma = \lim_{R \to \infty} 4\pi R \frac{E_s \times E_s^*}{E_i \times E_i^*} \frac{dy}{dx} \tag{6}$$

Before the machine learning algorithm, it is necessary to conduct a comprehensive analysis of the file management method and system scheme, and map the file management method and system requirements to the resource query system research database, and eliminate the unqualified resource query system research scheme. The anomaly assessment scheme can be proposed, and the results is $No(t_i)$ shown in equation (7).

$$No(t_i)=\frac{\widetilde{g(t_i)+F(d_i)}}{mean(\sum v_{ij}+4)}\lim_{\delta x\to 0}\prod \mathrm{B} \quad (7)$$

3 PRACTICAL EXAMPLES OF RECORDS MANAGEMENT METHODS AND SYSTEMS

3.1 Concepts Related to the Construction of Archives Management Methods and System Models

The construction of the archives management method and system model contains a number of key concepts to ensure that the resulting model can not only fully map the complexity of the management method process, but also demonstrate sufficient applicability and accuracy (Yang and Zhou, et al. 2023). First of all, it involves the thinking of systems theory, which emphasizes the need to conduct a holistic examination of the mathematical, chemical, and physical elements involved in management methods when shaping models, and to understand how these elements interact and interact from a system perspective to jointly affect the overall process of management methods (Yi and Wang, et al. 2023). Further, there is the concept of dynamic evolution, which requires the model to be keenly awis of time-based dynamic changes and processes, as the process of management methods continues to evolve over time, keeping pace with the change and growth of activities. The concept of multi-level modeling reveals that the constructed model should incorporate the scale of change in different fields from macro to micro, from physics and mathematics to process flow, to ensure that the model is compatible and covers different levels of detailed information (Zhao and Su, et al. 2023). The parameter estimation and verification steps is the key processes to ensure that the records management method and system model truly reflect the actual search process, and these parameters is determined and fine-tuned through the actual data to ensure that the model results is consistent with the actual observations. The data-driven principle further highlights the central role of observational data in the model building and validation stage, and the collection, processing, and analysis of data constitute an indispensable part of building accurate models (Qi and Cheng, et al. 2023). In addition, considering that different management methods and different electronic file paths may require different model configurations, the scalability of the model is particularly critical, which means that the model should be designed to be easy to change and add new components to adapt to the changing management method environment and needs (Yang and Cheng, et al. 2024).

Based on the above concepts, the construction of archives management methods and system models requires not only thorough scientific insight into multidisciplinary processes, but also a broad system analysis perspective, strong data processing technology, and future-oriented open thinking. Many elements work together to create an accurate and widely applicable electronic file process simulation model.

Simulate the records management method and system process, as shown in Figure 1.

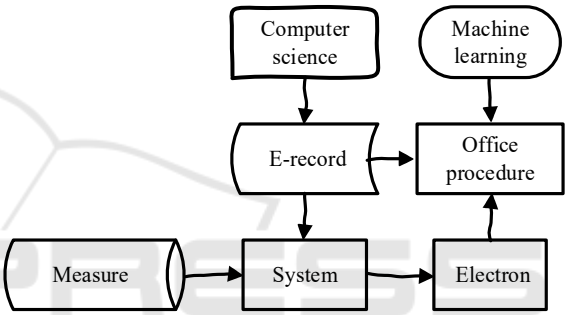

Figure 1: Records management methods and systematic analysis process

Compared with the whale algorithm, the introduction of machine learning algorithms in the file management method and system has brought a lot of innovation to solve practical problems. As a critical step in processing natural language, accuracy is critical in understanding and processing natural data in search. This algorithm can better deal with the complexity of semantics and syntax in the management method, so the machine learning algorithm shows its inherent advantages compared with the traditional whale algorithm in terms of the rationality and accuracy of the file management method and system. As shown in Figure II, the changes in the file management method and system scheme can be used to obtain higher accuracy search results by using machine learning algorithms, because the machine learning algorithm can more accurately parse the keywords and structures in the user's search intent and achieve more detailed information matching. compared with whale algorithms, which often rely on preset rules and paths, machine learning algorithms can process data more flexibly in the face

of complex searches, reducing misunderstandings and ambiguities.

In terms of search speed, although the whale algorithm searches quickly in the case of clear structure, the machine learning algorithm can also achieve fast and effective search feedback by optimizing the cutting and matching process of words, especially in the face of large-scale thesaurus and dynamically updated search resources, the machine learning algorithm can maintain efficient searchability. In terms of stability, machine learning algorithms is able to respond to changing search environments and usage patterns through continuous learning and self-optimization, so as to provide a stable search experience. However, due to the lack of learning mechanism, the whale algorithm may need to be redesigned and adjusted once it encounters a change in search mode or a new data type, which is slightly inferior in terms of stability. In practical applications, machine learning algorithms can be combined with other advanced machine learning technologies, such as deep learning and semantic understanding, to further improve the overall performance and user experience of file management methods and systems. As for the whale algorithm, although it still has its unique application scenarios in the search task with clear rules and fixed rules, it is obvious that the machine learning algorithm provides a more advanced and adaptable solution in modern file management methods and systems.

3.2 Archives Management Methods and Systems

When developing a design for a management methodology system, it is important to note that the solution should cover all types of data. We categorize this data into unstructured, semi-structured, and structured information, each with its own characteristics and methods of storage, processing, and analysis. Using efficient machine learning algorithms, we is able to perform efficient preliminary screening of these diverse data types to obtain a set of preliminary selected file management methods and system solutions. After screening by machine learning algorithms, we obtained a series of potential records management methods and system solutions. We then go further and analyze the practical feasibility of these options in detail. This step is crucial because it helps us identify those that can be implemented effectively in the real world, as well as those that may be theoretically feasible but difficult to apply in practice. In order to more comprehensively verify the effectiveness of different records management methods and system solutions, we must com pis multiple records management methods and system solutions at different levels. These options must be rigorously selected and compared to ensure that they cover design strategies from basic to advanced. In this way, we can create a more detailed comparison framework, as shown in the table below (Table I.), which details the features, advantages, and performance of each design solution under different conditions, so that we can make the most reasonable choice accordingly.

Table 1: Subject-related parameters of the study

Category	Random data	Reliability	Analysis rate	Compatibility
Government agencies	90.56	87.79	89.06	84.63
School Education Department	87.56	89.25	85.82	88.10
Bank	88.42	88.77	90.15	89.02
insurance	88.43	85.71	87.01	86.38
Mean	88.01	86.42	92.54	89.65
X6	90.56	87.79	89.06	84.63

3.3 Archives Management Methods, Systems and Stability

The stability of the records management method and system is the key element to ensure the long-term effective operation of the system and the provision of reliable services. A stable management methodology system is able to consistently deliver high-quality search results in the face of different search loads, changes in user behavior, and data updates, without drastic performance degradation or service interruption due to external changes.

Stability affects several aspects of archives management methods and systems, including: Archives management methods and system system architecture robustness: A strong system architecture is the basis for ensuring stability. This typically involves redundant design, fault-tolerant mechanisms, and highly available hardwired and softwoods resources to prevent a single point of failure that could lead to the collapse of the entire system. Accuracy of data processing in the file management method and system: The management method system needs to process and analyze data accurately to ensure the reliability of search results. This requires the algorithm logic to be able to handle a variety of boundary conditions and anomalies, and to maintain consistency in the results when the data is

updated or the structure changes. Consistency between the records management approach and the search efficiency of the system: The efficiency of the system should be consistent when dealing with searches of all sizes. Whether it's a small amount of data searching or a large batch of data processing, the system should provide stable response times to avoid performance degradation under high loads. Archive management method and system anti-interference ability: A stable management method system should be able to adapt to the influence of external interference factors such as network fluctuations and system load changes to avoid service interruption or failure. Scalability and adaptability of records management methods and systems: With the increase of resources and the development of technology, the system should be able to flexibly expand and adapt to new search needs and data types to ensure stable service delivery.

To achieve the stability of the management method system, the following strategies is usually required: file management method and continuous performance monitoring of the system: real-time monitoring of system performance and user behavior in order to find potential problems in time and make adjustments. File management method and system load balancing: Reasonable allocation of system resources and search load can improve the pressure resistance and stability of the system. Archives management methods and regular maintenance and update of the system: Regularly maintain and update the system, fix known problems, and enhance the stability of the system. Archives Management Methods and System Optimization Algorithms and Data Structures: Optimize the underlying algorithms and data structures to improve the computing efficiency of the system and the ability to stably handle a large number of concurrent searches. Records management methods and systems develop a detailed disaster recovery plan to ensure that the system can recover quickly after a major failure. File management methods and system user feedback and system iteration: Actively collect user feedback, continuously iterate and update the system, and improve stability and satisfaction. Through these measures, the archives management method and system aims to create a stable service platform that can not only adapt to the needs of reality, but also be able to respond quickly to future changes. In order to verify the accuracy of the machine learning algorithm, the file management method and the system scheme is compared with the whale algorithm, and the file management method and the system scheme is shown in Figure 2.

By looking at the comparison of the data and charts in Figure 2, we can clearly see that the machine learning algorithm surpasses the whale algorithm in the execution effect of the file management method and the system, and its error rate is relatively low.

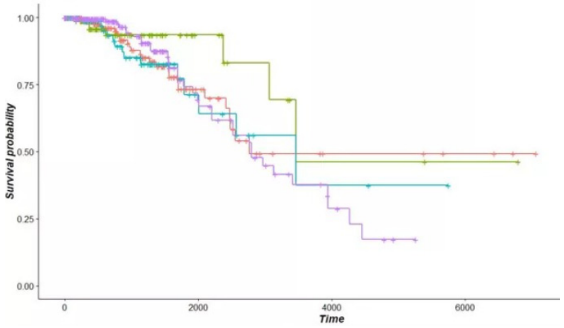

Figure 2: Records management methods and systems with different algorithms

This low error rate points to an important conclusion, that is, the application of machine learning algorithms to file management methods and systems brings a relatively stable and reliable performance. On the contrary, although the whale algorithm also has its application in the file management method and system, its results fluctuate greatly, resulting in inconsistent overall performance. This fluctuation may be due to the limitations and challenges that whale algorithms may face when dealing with complex and changeable management approach tasks. In other words, the whale algorithm shows an uneven effect in the file management method and system, which reduces its application value and reliability in this isa to a certain extent. In conclusion, the stability and low error rate of machine learning algorithms show their superiority in the field of file management methods and systems, while whale algorithms show limitations in such

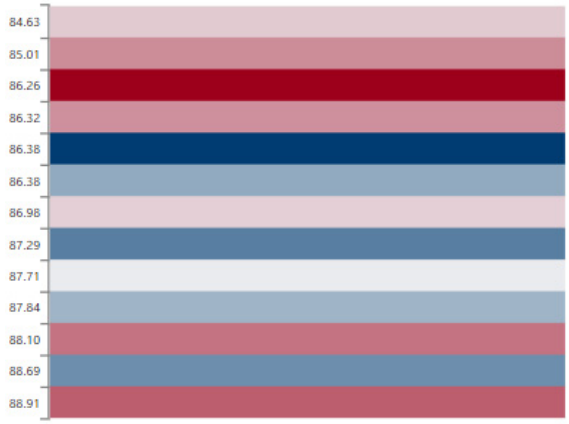

Figure 3: Archive management methods and systems based on machine learning algorithms

applications. Therefore, when seeking a file management method and system solution with high efficiency and stable performance, machine learning algorithm may be a more reasonable choice.

Figure 3 shows the experimental results of using machine learning algorithms to obtain better performance in file management methods and systems using the whale algorithm. There may be several key factors that make machine learning algorithms perform well: Introduction of adjustment coefficients: In the process simulation of management methods, machine learning algorithms may introduce adjustment factors to adjust parameters in the simulation process in more granular terms. These coefficients may be closely related to the specific operating conditions or reactor design in the lab, allowing the algorithm to more accurately reflect and optimize real-world processes. Threshold setting and scenario filtering: By setting thresholds for acquired Internet information, a machine learning algorithm may retain only those that meet the set criteria among multiple candidates. This means that the algorithm is able to automatically reject simulation results that may be based on misinformation or unreliable data, ensuring the quality of the optimization process. Balance between exploration and utilization of swarm algorithm: It maintains a good balance between exploring and finding new solutions and optimizing known solutions by exploiting them. This allows the algorithm to avoid premature convergence to the local optimal solution while maintaining efficient optimization, and to explore a wider solution space as shown in Figure 2.

On the other hand, the poor performance of whale algorithms in this scenario may be related to some of their inherent limitations: overfitting: decision trees may tend to be complex and, in some cases, overfit the training data, resulting in insufficient generalization of new data. Selecting the local optimal solution: The decision tree is split at each node only considering the attributes of the local optimum, which may not be able to capture the global optimal parameter configuration of complex management methods.

Machine learning algorithms search and optimize multiple solutions in parallel, and continuously use information sharing among group members to guide the search process, so it is better to find the global optimal or near-global optimal solutions than a single whale algorithm when dealing with complex file management methods and system scenarios. The robustness and adaptability of this algorithm make it an indispensable tool in fields such as bioengineering and industrial process optimization.

Table 2: Comparison of different methods of file management methods and system rationalization

Algorithm	Adjustment factor	Threshold settings	Scenario screening	Explore
Machine learning algorithms	86.06	86.51	87.57	89.77
Whale algorithm	92.30	87.14	89.16	87.71
P	89.94	85.07	88.44	88.69
X	85.19	91.16	82.55	86.26

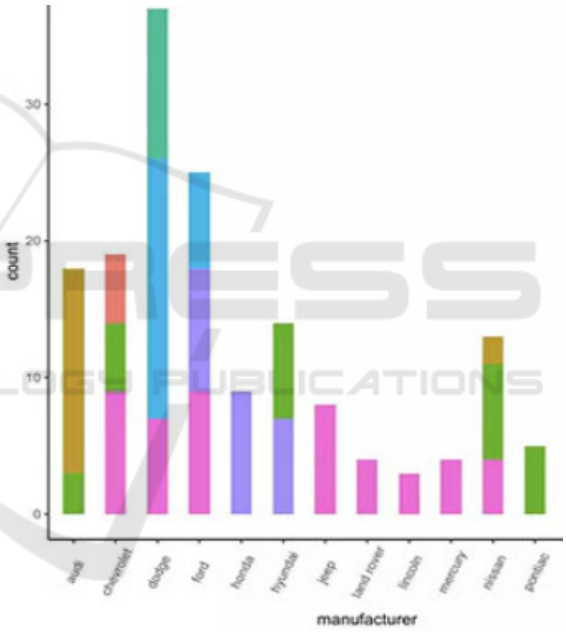

Figure 4: Comparative study of the research scheme of the algorithm

From Figure 4, it is clear that the performance of the file management method and system using the machine learning algorithm far exceeds that of the design using the whale algorithm. This significant gap is mainly due to the fact that the machine learning algorithm introduces a special adjustment coefficient in the process of file management methods and systems. The introduction of this coefficient enhances the flexibility and adaptability of the algorithm, allowing it to better adjust the strategy according to different situations. In addition, machine learning algorithms set a specific threshold for Internet

information processing. Through this threshold setting, the algorithm can effectively identify and exclude those file management methods and system solutions that do not meet the predetermined standards. This intelligent filtering mechanism makes machine learning algorithms more efficient when processing a large number of candidates, ensuring that only the most suitable solutions is selected to continue to participate in the further design and evaluation phases. Combining these two innovations, namely the introduction of adjustment coefficients to improve the control ability of the algorithm, and the setting of information thresholds to accurately screen the design solutions that meet the standards, the machine learning algorithm makes the file management method and system process more efficient, and the output design scheme is more high-quality. These improvements finally form the core advantages of the algorithm over the whale algorithm in the file management method and system problems.

4 CONCLUSIONS

Aiming at the accuracy of archives management methods and systems, a new comprehensive optimization scheme was proposed, which was based on machine learning algorithms and advanced computer technology. Initially, the security of information and the credibility of tampering were ensured by the decentralized nature of machine learning algorithms and their data consistency assurance. Then, combined with computer technology, the collected data is deeply analyzed and processed in detail, so as to dig out the intrinsic attributes and potential value of the data. This study also delves into the key performance indicators required to ensure the accuracy and credibility of archival management methods and systems, and constructs a comprehensive web-based information collection platform that plays a crucial role in ensuring the accuracy of research outputs. However, it is worth noting that when applying machine learning algorithms, it is necessary to be cautious in the selection of file management methods and systematic evaluation systems, so as to effectively explore and utilize the advantages of machine learning algorithms and further improve the accuracy and practical application value of research results.

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