

## Research on Visualization Management of Human Resources Based on Big Data Neural Network Technology

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### ABSTRACT

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*human resource management, big data sharing, neural network, management visualization*

By using big data technology, enterprise human resource management can achieve business process acceleration and network data sharing efficiency with low delay and high reliability. Multi-directional shared data collection and application can build the interconnection and Internet ecological environment of enterprise human resource management big data, and it is also the main development trend of enterprise human resource intelligent management. In this paper, through the enterprise human resources big data visualization technology method and neural network technology method, to achieve the enterprise human resources intelligent visual management goals.

## 1. INTRODUCTION

Enterprise human resources Visual management for enterprise development, talent management, talent supply and demand, enterprise human resources recruitment budget, post setting budget cost budget, performance evaluation, people post matching, education, training, compensation and other business data visualization process, the formation of various business data of middle management human resources management. Modern enterprise human resource management comprehensively utilizes big data sharing technology, artificial intelligence, cloud computing and other new-generation information technologies. Integrates the perceptual digital technologies such as video structure, biometrics, behavior recognition, person-post matching, and talent organization portrait in the process of human resource management [1]. Big data technology can be used for optical, image and video storage and reproduction of their related data, and can be used to process information including big data, voice and video, so as to meet the urgent needs of visual management of human resources in enterprises [2].

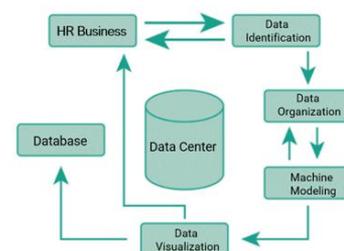
Neural network and big data visualization technology play a decisive role in solving the intelligent visualization management of enterprise human resources [3], and apply high performance, high security, high privacy requirements, high availability and high scalability to the intelligent platform of enterprise human resources management. Promoting the practice and application of big data visualization technology and establishing a big data visualization platform for enterprise human resources holographic management is an important task goal of enterprise human resources management [4].

The visualization of human resources data is an important part of the big data solution of the human resources intelligent hanging effort platform. The big data visualization platform achieves the purpose of using the platform through centralized analysis and processing of massive data of enterprise human resources, and through machine learning, cognitive computing

and neural network technology [5]. Use the big data processing platform to call the corresponding data for the construction of the visual application platform, and make the decision-making analysis and early-warning decision of the supply and demand of the talent team for the human resource management decision-makers of the enterprise.

## 2. VISUAL MACHINE LEARNING MODELING

The human resources holographic big data visualization platform provides a variety of visualization effects, including data visualization, model visualization and model evaluation results visualization. Holographic large human resources data visualization platform with streamline, visual modeling interface, built-in statistical mining algorithm and deep learning algorithms, the algorithm configuration simple threshold to reduce the use of machine learning, human resource integration platform, users can easily drag drag components operation, visual modeling, the construction of the complete process model, In addition, HR business model can be published and managed, and enterprise data can be mined and analyzed by means of machine learning and relevant HR management business problems can be solved.



**Figure 1.** HR holographic big data visualization modeling

The application scenario of visualized machine learning modeling technology through process, data identification, data

organization, data processing and modeling, and visual algorithm configuration, support SQL and Python scalable business and their statistical analysis and statistical analysis and their statistical analysis and their Feature engineering; support text analysis: such as words, words bags, frequent words, etc.; Including classification, regression, clustering, association, predictive algorithm; provide algorithm automatic participation results model model self-learning modeling.

The HR holographic big data visualization platform has rich data preprocessing capabilities and supports parallel preprocessing operations, such as merging rows, removing duplicate values, filtering null values, increasing serial numbers, type conversion, random sampling, weighted sampling, hierarchical sampling and splitting, etc.

The HR holographic big data visualization platform supports machine learning classification, clustering and regression algorithms, including a variety of training models: logistic regression, progressive gradient decision tree, decision tree, naive Bayes, support vector machine, linear regression model. The human resource holographic big data visualization platform has a self-learning model of big data mining, which can automatically supplement new data for retraining, ensure the accuracy of model prediction, and greatly reduce the workload of human resource managers (Figure 1).

### **3. LINGUISTIC ANALYSIS AND MDX MULTIDIMENSIONAL ANALYSIS BASED ON BIG DATA**

#### **3.1 Natural language intelligent interaction analysis**

The human resources holographic big data visualization platform technology endows the human resources integrated platform intelligent robot system with powerful language parsing capabilities, which can quickly feed back the corresponding human resources business management information to users, and is committed to helping human resource managers to intelligently visualize big data Application Analysis.

HR holographic big data visualization technology has the ability to interact with natural language, simplifies and beautifies the interface, and directly inputs and outputs human resources business processing on the page. Natural language analysis can automatically analyze human resources data queries and ask whether the query results are correct. Improve the accuracy of subsequent queries. The platform technology can support voice input and text input, automatically parse and generate charts or corresponding answer information, and the generated natural language analysis results can be seamlessly connected to the BI function for further analysis and processing.

#### **3.2 MDX multidimensional analysis of big data**

HR Big Data MDX multidimensional analysis supports the creation of custom members that are regrouped into new dimensional members by arithmetic operators, numbers, and MDX statements. Human resources holographic big data visualization platform technology directly connects with professional multidimensional databases (Essbase, SSAS, etc.) to provide classic OLAP operations and visualization operations, including: Slicing, cutting, drilling and row and column exchange, etc., can meet the statistical analysis of

human resources employment and related businesses, such as proportion, ranking, summary and other common calculations, as well as the time calculation of the same period, sequential, growth rate and so on.

HR holographic technology of data visualization platform by building the human resource and knowledge map data visualization engine driven cognitive inference engine, can automatically draw hr holographic data visualization, data within the scope of authority and fully interactive, change data attribution, with AI can assign human resources data visualization analysis report.

### **4. HUMAN RESOURCES BIG DATA VISUALIZATION TECHNOLOGY METHODS**

Core technologies of human resource big data include: 5G machine interconnection technology, edge computing technology, Internet of Things technology, block chain computing technology, nervous system identification parsing technology, deep learning technology and IPv6 machine access technology, etc. The enterprise human resource big data visualization platform covers the integration process of big data analysis of human resource business and BI. The human resource management business database, data warehouse and big data analysis platform form a management framework for human resource business processing, data mining and visualization [6]. The enterprise human resources big data visualization platform can meet the needs of all users for various data analysis applications, such as big data analysis, visual analysis, exploratory analysis, complex reports and application sharing.

#### **4.1 Graphical visualization of human resource management**

Human resources big data visualization technology supports Excel built-in graphics, interconnects with Charts data visualization engine, integrates Echarts4.8 by default, supports Excel drawing, combines dynamic and static, and Excel graphics templates can be directly reused [7]; it has a complete ECharts graphics library, It supports 3D dynamic models, supports multi-dimensional graphics extensions online, and can integrate other HTML5 graphics controls and related dynamic graphics mode libraries.

#### **4.2 HR organization map visualization**

Map visualization of human resources organization supports migration, route, heat, scatter, dyeing, 3D and other maps, with built-in interfaces such as Baidu Map, Tencent Map and Gaode Map. Organizational map visualization can support integration with ArcGIS, Google Map, Map of heaven and Earth, etc. [8], and can quickly make data maps based on accurate geographic coordinate information. Through artificial intelligence biometric identification system and ERP business management cockpit system management, business fixed point management and personnel flow management can be carried out for all staff.

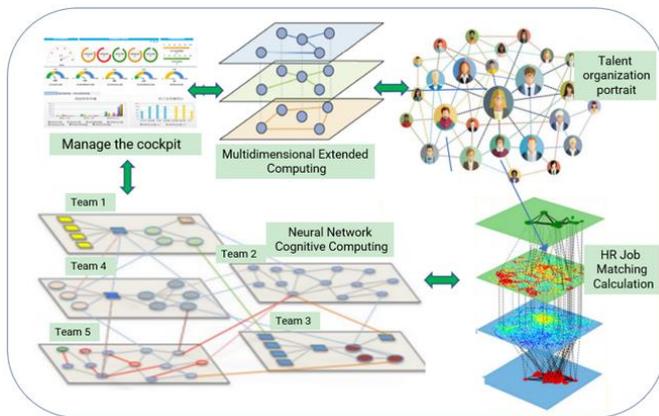
#### **4.3 Human resource management cockpit large-screen data visualization**

Multi-component combination is used to create a large

screen of human resource management cockpit data, and big data visualization configuration can be performed during the process of human resource performance, which can flexibly layout and quickly publish enterprise human resource information. The human resources visual management platform meets the needs of various human resources big data business application scenarios, and supports the creation of dashboards by visual dragging and dropping. With a variety of built-in theme styles and rich interactive controls, rich built-in chart components can be configured according to the technical requirements of the enterprise human resources intelligent management platform to provide users with intelligent map suggestions.

## 5. HUMAN RESOURCE NEURAL NETWORK TECHNOLOGY METHOD

In the process of enterprise human resource visual management, the application of neural network in human resource visual management is shown in Figure 2:



**Figure 2.** Application of neural network in visualization management of human resources

Use the perceptron neural network algorithm to sort out the data of the enterprise human resources visualization management platform, and implement the application code in the big data processing program. Through the construction of the perceptron neural network in the middle stage of HR data, a neural network for perception and recognition of enterprise human resources visualization big data is generated.

Initialize perceptron neural network (code implementation and operation verification) by using network simulation calculation and analysis process (code implementation and operation verification) and by code and operation result description. Through the code and operation results, the perceptron neural network learning and network training (code implementation and operation verification) are carried out to obtain the data lake perception, recognition and calculation results of the data center of the enterprise human resource intelligent management platform.

Through the interactive learning and training of the neural network, the correct result of the code running verification can be achieved. Input the classification visualization problem and its solution problem, and get the standardized learning rule training samples for big data perception processing of the enterprise human resource intelligent management platform

through the code and operation result description, including the solution of complex problems.

Through the perception processing of big data, the training samples of human resources visualization standard learning rules can be obtained, which can be used to solve the complex problems of neural network computing. Through code implementation and running results, the design of multiple neural network algorithms can solve the problem of big data classification, and achieve the purposes of big data sharing, cognitive computing, extended computing, sorting and visualization of enterprise human resource management.

## 6. RESEARCH CONCLUSIONS

The construction of enterprise human resource big data visualization platform consists of big data center, ERP business big data center, and the data center of each branch of the enterprise. The data resources from the third-party data platform bring heterogeneous data redundancy to the human resource visualization management platform. The unified interface and big data interconnection mechanism of each platform are needed to solve this problem. By mastering and applying big data visualization technology, enterprise human resource holographic management can be promoted quickly, which is of great significance to the development of enterprise human resource holographic new management.

## REFERENCES

- [1] Telecommunications Research Institute of the Ministry of Industry and Information Technology. (2014). Big Data White Paper. Beijing: Institute of Telecommunications, Ministry of Industry and Information Technology.
- [2] Altuntas, S., Dereli, T., Kusiak, A. (2016). Assessment of corporate innovation capability with a data-mining approach: industrial case studies. *Computers & Industrial Engineering*, 102: 58-68. <https://doi.org/10.1016/j.cie.2016.10.018>
- [3] Computer Network Information Center of Chinese Academy of Sciences. (2017). A deep learning method and system for big data: China, CN106570565AA[P/OL].
- [4] Yu, L. (2013). Big data and big data economics. *China Soft Science*, 32(7): 177-183.
- [5] Silver, D., Huang, A., Maddison, C.J., Guez, A., Sifre, L., Van Den Driessche, G., Hassabis, D. (2016). Mastering the game of Go with deep neural networks and tree search. *nature*, 529(7587): 484-489. <https://doi.org/10.1038/nature16961>
- [6] Liao, J.X. (2015). The application status and prospect of big data technology. *Telecommunications Science*, 7: 7-18.
- [7] Kiron, D., Prentice, P.K., Ferguson, R.B. (2014). The analytics mandate. *MIT Sloan management review*, 55(4): 1.
- [8] Wamba, S.F., Gunasekaran, A., Akter, S., Ren, S.J.F., Dubey, R., Childe, S.J. (2017). Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research*, 70: 356-365. <https://doi.org/10.1016/j.jbusres.2016.08.009>