Hindawi
Wireless Communications and Mobile Computing
Volume 2022, Article ID 7011683, 9 pages
https://doi.org/10.1155/2022/7011683

Research Article

Construction and Empirical Study of Show Analysis Model of Enterprise Mankind Resource Management Based on Deep Learning

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Received 6 April 2022; Revised 6 May 2022; Accepted 17 May 2022; Published 22 June 2022

Academic Editor: Chia-Huei Wu

Owing to the rapid expend of the global economy and the increasingly fierce competition among enterprises, scientific and modern management has been gradually adopted in the transaction processing of enterprises. Especially for the show appraisal of enterprises, the traditional appraisal has a lot of subjective influence of managers, so the traditional show appraisal methods cannot meet the need for survival and expend of enterprises. The pressure of talent demand is increasing, which makes many enterprises pay more attention to whether their own mankind resource management system supports the company's strategic spend and can win advantages in the competition of talent structure, organizational structure, and management process. Numerous foreign enterprises use mankind resource audit to achieve this goal, but at present, there is little practice in China that enterprise show evaluation is an important basic work and core content of mankind resource management and expend. Improving the effectiveness of enterprise show evaluation is of great significance to increase the core competitiveness of enterprises and promote the sustainable expend of enterprises. Therefore, this paper designs a model based on collaborative filtering algorithm to analyze the show of mankind resource management of enterprises and has achieved good results. Compared with the original algorithm, the model designed in this paper has a 65.4% improvement in algorithm, which will greatly simplify the calculation process and improve the model processing efficiency. The numerical results show that there is an inevitable linear correlation between mankind resource management and enterprise show. This index can reflect that the accuracy of the model has been enhanced by 74.3%.

1. Introduction

With the expend and widespread application of information technology, the global economy tends to be integrated, and mankind society has entered the era of knowledge economy [1]. The arrival of the new era makes the spend and utilization of mankind resources play an increasingly important role. Mankind resource management has developed from the past as a management function to maintain the normal operation of the organization to the level of enterprise strategic management [2]. As the management of mankind resources is less likely to be done imitated, the competitive advantage gained through the practice of mankind resources management may be more lasting than that gained through other means. However, in the era of knowledge economy, there are many new things in mankind resource management, such as how to quantify mankind resources, how to participate in profit distribution, and how to improve productivity and ensure its effectiveness. These are all key issues [3]. Because no matter whether the enterprise adopts cost strategy, innovation strategy, quality strategy, service strategy, or other strategies, the implementation of the strategy ultimately depends on the employees of the enterprise [4]. The most valuable resource of an enterprise is talents. The rational allocation and management of talents determine the work efficiency and production capacity of the enterprise. Therefore, in general, the competition of enterprises is

actually the competition of talents [5]. On the one hand, most enterprises are faced with the shortage of technical talents and the mismatch between talents and positions; organizations create greater value [6]. Some studies show that there are a statistically positive correlation between an effective mankind resource management system and enterprise show indicators such as labor productivity, service quality, market share, and per capita profit rate.

At present, there are some things in the show appraisal of enterprise employees, such as imperfect appraisal objectives and formality of appraisal, which makes the show appraisal a difficult problem perplexing the enterprise mankind resource management and does not give full play to the role of show appraisal in the enterprise mankind resource management [7]. With deep learning(DL) returning to the academic field of vision and becoming a research hotspot again, some scholars have tried to apply DL in the field of recommendation system, hoping that the feature extraction ability of DL, which is superior to traditional machine learning methods, can be used in recommendation system to better solve the recommendation problem [8]. At the same time, the role of industry characteristics has become prominent, and the matching of mankind resource management practices with industry characteristics is at the root of an enterprise's competitive advantage. The research on enterprises in different industries has confirmed that there are equally significant differences in the impact of industry differences on mankind resource management practices [9]. However, in research on mankind resource management practice and enterprise show in the past decades, industry characteristics are mostly regarded as control variables [10]. Therefore, mankind resource management workers need to quantitatively measure and evaluate the show of mankind resource management to show the work effect of the department, so as to get sincere recognition from all business departments and superior management departments and make mankind resource management work embark on a virtuous circle [11]. The following is the innovations of this research:

(1) Based on the background of DL, this paper proposes to extract and analyze the hidden features of enterprise mankind resource management combined with the neural network model and conduct data analysis and screening through the characteristics of fuzzy theoretical algorithms and neural networks [12]. It further reflects the reliability of the model designed in this paper in the analysis of research show

(2) This paper will combine collaborative filtering algorithm and hybrid algorithm to establish the basic algorithm framework of the model, optimize the design on the traditional collaborative filtering algorithm, and adopt hybrid algorithm to analyze the show, so as to improve the analysis efficiency and accuracy of the analysis results [13]. CDL-HF and content-based filtering algorithms are mixed to integrate the advantages of the two algorithms, improve the shortcomings of the former in the cold start problem, and further improve the quality of mankind resources show analysis

According to the content involved in this article and the needs of the article structure, this article will be divided into five chapters, the content of each chapter is as follows:

The first chapter introduces the background and significance of the topic and puts forward the research innovation and structural arrangement of this paper. The second chapter introduces the related work. This chapter analyzes the research status of mankind resource show analysis of domestic and foreign enterprises; and the research content and work of this paper are given. The third chapter introduces the basic theory of related theoretical research, which lays a theoretical foundation for the subsequent research. Furthermore, a show analytical model based on DL is put forward, and its specific implementation method is introduced in detail. The fourth chapter is empirical research. This chapter makes an empirical analysis on the constructed show analysis model, verifies the scientifically and rationality of the evaluation system, and shows that the algorithm model constructed in this paper has certain practical value. Chapter 5 summarizes the conclusions and limitations of the full-text research and proposes future research directions.

2. Related Work

The earlier mankind resource recommendation system was proposed by Wenqi in 2000. They developed an employment recommendation system called Casper, which integrates two recommendation functions of automatic collaborative filtering and matching retrieval [14]. Zhao et al. pointed out that enterprises can adopt three strategies to deal with a complex and dynamic environment. These three types of enterprises are defenders, explorers, and analysts, and they also stressed that there are three management modes: traditional mode, interpersonal mode, and mankind resource mode [15]. Lechuga Sancho et al. think that employee's role behavior is the theoretical basis for linking competitive strategy and mankind resource management. Different strategies require different staff roles and behaviors, so different mankind resource management practices are needed [16]. Chidiebere and Jake's research emphasizes the organic connection of HRMP as a whole and believes that HRMP is a series of independent and interconnected activities and processes that achieve corporate goals by attracting, cultivating, and maintaining mankind resources [17]. Fang believes that HRMP is a series of planned management activities and mankind resource deployment implemented by the organization to meet its objectives. In order to improve the matching degree of mankind resources, collaborative filtering algorithm and content-based recommendation algorithm are combined. The hybrid model algorithm is mainly proposed to solve the thing of data cold start and data sparsity [18]. Otto put forward a hybrid model to recommend mankind resources, mainly to solve the existing thing of cold start data and sparse data [19]. Li et al.

proposed that there are features based on the word level, it is difficult to calculate the similarity of text between sentences, and it is impossible to analyze the similarity of resumes and recruitment requirements as a whole, because in reality recruitment, experts analyze the correlation between job seekers and recruitment requirements as a whole [20]. Jungmin and Hwansoo put forward an employment recommendation framework based on big data technology, which is used to deal with the massive heterogeneous data existing in the real recommendation system. At the same time, a two-way recommendation model based on association rules and clustering is adopted for effective mankind resource recommendation [21]. Lin-Hi et al. studied the HR recommendation engine using hybrid recommendation algorithm and mixed PLSA and content-based filtering algorithms to obtain a two-way HR recommendation algorithm, which was utilized to recommend jobs and job seekers, respectively [22]. Bodega's research shows that the organizational public opinion survey is effective in evaluating the public opinion of enterprises. Overall satisfaction, employees' recognition of organizational goals and identifying the thing need to be solved intensively. On the other hand, the organizational public opinion survey cannot explain the relationship between workers' attitude and enterprise mankind resource efficiency [23]. Gurkov et al. believe that mankind resource management by objectives is to use the basic principles of management by objectives to establish a series of goals to evaluate mankind resource work according to the requirements of organizational goals. In this approach, the key is that the goals are reasonable, measurable, time-sensitive, challenging, and realistic and can gain an understanding of all participants [24]. The research results of A. Naseer et al. show that these key indicators include employment, equal employment opportunity, training, employee evaluation and expend, career expend, wage management, welfare, work environment safety, labor relations, and total utility. Each key indicator needs to give several quantifiable indicators [25]. Shet et al. and Liu used the principal component analysis method to analyze many factors in the employee show evaluation system in the article "Principal Component Analysis of Employee show Evaluation System" and simplified many factors affecting employee show into a few comprehensive components, that is, using principal component analysis to determine the key indicators of show evaluation [26, 27].

On the basis of the above-mentioned related research, this paper determines the positive role of DL in the field of enterprise mankind resource management show analysis, constructs a show analysis model combining various algorithms, makes deep analysis and research on the acquired and collected data by using DL and algorithms, makes more effective use of the data, and mines valuable information hidden behind the data, so as to simplify and make the management more efficient.

3. Methodology

3.1. Basic Overview of DL Models. Since the restricted Boltzmann machine (RBM) is developed from the Boltzmann machine, it is a two-layer undirected graph model. The main difference from the latter is that RBM adopts the structural model of full connection between layers and no connection within layers. Its structure is shown in Figure 1.

$v_i(0 \le i \le m)$ represents the visible node and constitutes the visible layer, and $h_j(0 \le j \le n)$ represents the hidden node and constitutes the hidden layer. The connection weight between visible nodes and hidden nodes is represented by connection matrix W, where W_{ij} is the connection weight of i node in visible layer and j node in hidden layer. As can be seen from the figure, since there is no connection between nodes in the same layer, visible nodes and hidden nodes are independent of other nodes in the same layer. In a restricted Boltzmann machine, the visible layer usually represents the original input data, while the hidden layer represents the data generated by DL, expressing the hidden features of the initial data. With the above structure, the energy function can be expressed as

$$E(v, h) = -\sum_i v_i b_i - \sum_j h_j c_j - \sum_{i,j} v_i h_j W_{ij}. \quad (1)$$

In the above formula, v_i, b_i represents the value and offset of the i node of the visible layer, h_j, c_j represents the value and offset of the j node of the visible layer, and W_{ij}represents the connection weight between the i node of the visible layer and the j node of the hidden layer. The influence process of restricted Boltzmann machine training is the optimal expression. After calculating the optimal value of the parameters in the expression, the initial input data can be fitted.

3.2. A Summary of Show Analysis of Enterprise Mankind Resource Management. Show is a kind of judgment on behavior show and behavior results, which are inseparable from goals. Therefore, show is usually defined as the degree of achievement of goals and the economy of achievement. However, due to the unbalanced expend of regional economy, the adjustment of economic structure, and the imperfect legal construction of talent flow, employee turnover has become an important problem that plagues many organizations today [28]. Enterprise mankind resource management system is a complex system, and the constraints of many subjective and objective factors make enterprise mankind resource management show evaluation very complicated. There are different understandings of the contents and dimensions of HRMP, and a lot of researches have been done to define its contents and reconstruct its connotation. The best HRMP includes seven contents: internal promotion opportunity, smooth complaint mechanism, scientific evaluation method, job safety, job definition, benefit sharing, and formal training system. In enterprise mankind resource management, the results of show appraisal directly determine the economic income of employees and have a great impact on the enthusiasm of employees. If the results of show appraisal can be effectively managed and controlled and connected with the medium and high-level needs of employees' personal expend, the low-level needs of employees can be organically combined with the high-level

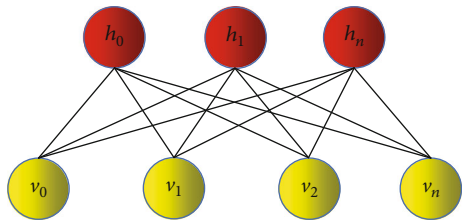

Figure 1: Schematic diagram of the restricted Boltzmann machine architecture.

needs of employees, so as to stimulate employees [29, 30]. Enterprise show has multidimensional structure and points out that these dimensions include financial show such as return on assets and return on sales, business show such as sales growth and market share, and organizational show such as product quality and employee satisfaction. Figure 2 shows the quadrant analysis diagram of enterprise show.

This paper holds that show generally includes two aspects: on the one hand, it refers to work results, which is equivalent to what is usually called show, such as work efficiency and benefits or profits generated by work, and on the other hand, it refers to behaviors, abilities, skills, and qualities that affect work results. Therefore, show includes not only static result content but also dynamic process content. The two complement each other, the result is the ultimate goal of the work, and the process affects and controls the realization of the goal. This paper believes that in the definition of show, the input of enterprises to employees should be taken into account, and the employee output under the input of enterprises is the real show. Show reflects the efficiency and effectiveness of enterprise members in completing a specific task given by the enterprise, as well as the future contribution rate of employees to the enterprise, which is the value of enterprise members to the enterprise. According to the input-output principle, this paper holds that employee show is the quantitative relationship between enterprise input and employee show, that is, employee show output rate, based on enterprise input, work results, and show.

3.3. Algorithm Design of Show Analysis Model. In order to further improve the recommendation quality of mankind resources recommendation system, we should rely on the power of emerging technologies, and the next breakthrough in the technical field of recommendation system is in-depth learning. Therefore, this paper hopes to research and improve the recommendation algorithm based on DL and apply it in the field of mankind resources recommendation, so as to prove the feasibility of the recommendation algorithm based on DL in this field. Show management refers to an effective and complete system that improves organizational show and achieves organizational goals by managing employee show in a specific organizational environment, linked to specific organizational strategic goals. The core of show management is to manage employees.

3.3.1. Algorithm Design and Optimization. Collaborative filtering algorithms are generally divided into user-based and project-based aspects. Among user-based collaborative filtering algorithms, collaborative filtering algorithm has two main processes. Figure 3 shows the overall design of the algorithm.

Set the similarity between user a and user b. Each user's rating on an item is expressed by an m dimension vector, and the similarity between users can be expressed by the similarity between two vectors. The second step is to generate the corresponding filtering calculation, and the expression is as follows.

$$P_{a,i} = \bar{R}_a + \frac{\sum_{b \in NNa} \mathrm{sim}(a,b) * \left(R_{b,i} - \bar{R}_b\right)}{\sum_{b \in NNa} |\mathrm{sim}(a,b)|}, \tag{2}$$

where $\mathrm{sim}(a,b)$ represents the similarity between users a, b, R_a, R_b represents the average rating of user a, b on all items, and $R_{b,i}$ represents the rating of user b on item i. Therefore, when all the scores are obtained by the above calculation and method, the output result to the model is the top N items in the score, which is called $top - N$ analysis.

The same principle is true for project-based collaborative filtering algorithms. On the basis of the above, this paper proposes a model-based collaborative filtering algorithm. It mainly uses the existing methods in the fields of machine learning, data mining, and information retrieval to process the user data offline and establish a model for prediction. The commonly used models include naive Bayesian classification model, linear regression model, argot meaning model, and probability correlation model. Therefore, we get the following formula about the implicit meaning model.

$$\mathrm{Rating}(a,i) = R_{a,i} = u_a^T v_i = \sum_{k=1}^{K} u_{a,k} v_{i,k}. \tag{3}$$

In the formula, $u_{a,k}, v_{i,k}$ represents the parameters of the model, where $u_{a,k}$ measures the interest of user a and the type relationship of the k hidden semantic and$v_{i,k}$ measures the relationship between the k hidden semantic and project i. Because of the automatic clustering of statistical data, it has a good precision control in solving show analysis the thing is.

This paper extends to the neural network algorithm on the basis of DL. Due to the special role and simplification characteristics of the neural network algorithm in various fields, this paper will optimize the structure and process of the algorithm due to the recurrent neural network. The cyclic processing of filtering generally has a nonlinear activation function:

$$d_j = f\left(N_j * X + b_j\right), \tag{4}$$

where j represents the j channel, d_j represents the processing results of different channels, X represents the input data, N_j

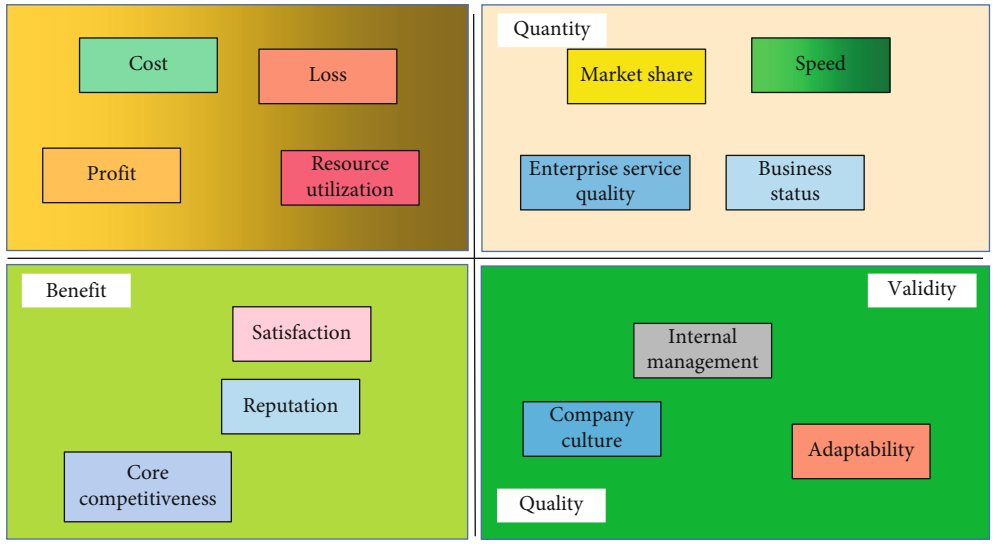

Figure 2: Schematic diagram of quadrant analysis of corporate show.

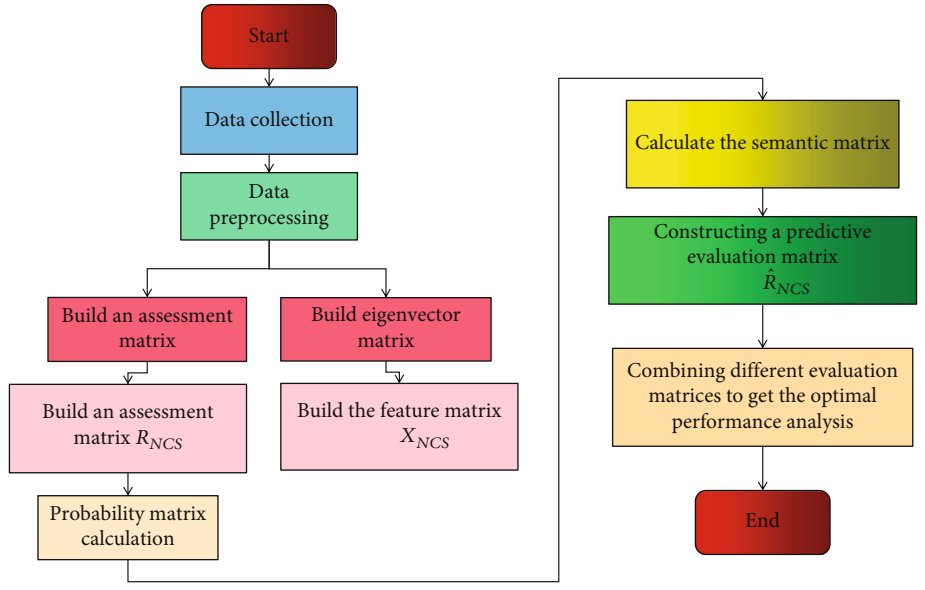

Figure 3: Overall design of the algorithm.

represents the corresponding convolution kernel, and b_j corresponds to the offset of the channel. Then, the acquisition of features is

$$d_j = \left[d_1, d_2, \cdots, d_j\right]. \tag{5}$$

Single volume can only act on a single local block of data, and a set of shared unique filters can be used to iterate through all the data blocks repeatedly, which cannot extract multiple integrity features. The CDL-HF algorithm uses the fusion feature of the item as the original input of the algorithm and performs the collaborative filtering algorithm processing on the scoring information while performing deep representation learning on the fusion feature of the item. The processing of these two parts is performed alternately in the CDL-HF model and mutual improvement.

When calculating the show evaluation of different types of indicators, it is necessary to change the types. In the show evaluation, cost-based indicators, intermediate indicators, and interval-based indicators are all converted into benefit-based indicators. The basic formula of fuzzy theory is

$$S = \{U, A, D, V|f\}. \tag{6}$$

As the domain of U under the background of fuzzy situation, S has a certain mapping relationship with attribute set A, relationship set $D(D \neq \varphi)$, and restriction set $V = U_{a \in C \cup D} V_a$. When $P \subseteq C \cup D$, there is

$$IND(P) = \left\{(x, y) \in U^2 | f(x, a) = f(y, a), \forall a \in P\right\}. \tag{7}$$

If the upper and lower parts are similar, the general form is as follows:

$$P_*(X) = \left\{ x \in U \middle| [x]_p \subseteq X \right\},$$
$$P^*(X) = \left\{ x \in U \middle| [x]_p \cap X \neq \varphi \right\}. \tag{8}$$

The above relationship set D will be divided into

$$POS_P(D) = \cup_{X \in U/D} P_*(X). \tag{9}$$

At this time, P has fuzzy classification ability relative to D and meets the following relationships:

$$\begin{cases} POS_R(D) = POS_C(D), \\ POS_{R-\{a\}}(D) \neq POS_C(D), \forall_a \in R. \end{cases} \tag{10}$$

When we need to deal with a specific fuzzy set of elements, we need to set classification criteria to distinguish the following:

$$[U/A : p] = \begin{bmatrix} X_1 & X_2 & \cdots & X_n \\ p(X_1) & p(X_2) & \cdots & p(X_n) \end{bmatrix}, \tag{11}$$

$$[U/B : p] = \begin{bmatrix} Y_1 & Y_2 & \cdots & Y_m \\ p(Y_1) & p(Y_2) & \cdots & p(Y_m) \end{bmatrix}. \tag{12}$$

Through the above division, the fuzzy situation will be effectively described, so that the algorithm of the model can meet the needs of show analysis, and the analysis will be more specific and accurate in different situations. The fuzzy comprehensive evaluation method of specific elements is very simple, and a fair and reasonable evaluation can be obtained when there are few factors. However, when the evaluation is more complex and the factors considered are more and more complex, this method will lead to the limitations of evaluation and assessment.

4. Result Analysis and Discussion

Based on the design of the above model, the simulation experiment is carried out, and the experimental data is used to illustrate the feasibility and reliability of the model and whether it has the effect of optimization and simplification in actual operation and application. After actual operation, data are obtained, as shown in Figures 4 and 5.

It can be seen from the above two figures that the mean and standard deviation are at a low level in the previous analysis and then reach a high level between quantitative dimensions 2-4, indicating that the effect of quantitative data force is good. Since the data is close to 0.5, it indicates high stability and good internal consistency. In terms of credibility, as the overall trend continues to rise, it can be seen that the model designed in this paper has good practicability in practical operation.

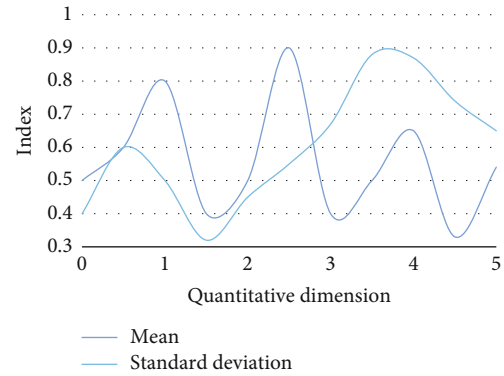

Figure 4: Analysis of the mean and standard deviation of mankind resource management.

Taking the show of the investigated enterprise as the dependent variable and the evaluation result of mankind resource management as the independent variable, we can judge the correlation between mankind resource management practice and enterprise show according to the significant degree of correlation coefficient, as shown in Figures 6 and 7.

Since the regression coefficient parameter is a nonstandardized parameter, the relevant data and analysis can be obtained after the trend and comparison results are known from the graphs, because the associated probability value has been kept stable between 2 and 8, so the regression equation shows that there is an inevitable linear correlation between mankind resource management and enterprise show. This index can reflect that the accuracy of the model has been improved by 74.3%. At the same time, when analyzing the standard error show of regression estimation, it can be obtained that under the quantitative analysis of standard error data, it shows that the linear regression equation is highly representative. Show appraisal is the evaluation of achievements. In the process of implementation, the production and operation of enterprises are the main objectives, and then, the objectives are reasonably divided. By analyzing the daily work behaviors of enterprises, the job responsibilities of enterprises can be determined; that is, the obligations that enterprises need to perform in their own jobs can be analyzed. Digitize the enterprise show index, evaluate the show of the enterprise, and link the evaluation results with the interests of the enterprise. For enterprises that do not meet the basic requirements, the enterprise needs to reduce its salary level, so as to promote the enterprise to improve its own quality in order to obtain high salary, regulate its daily behavior, and then realize the restraint and supervision of the enterprise and the optimization of mankind resources.

In addition, based on DL, this paper has carried out a series of algorithm structure optimization and design. Figure 8 shows the comparison of recall rates of 8 algorithms.

The hybrid collaborative filtering algorithm combines the DL model and the traditional collaborative filtering model and overcomes the problem of data sparsity of the traditional collaborative filtering algorithm to a certain

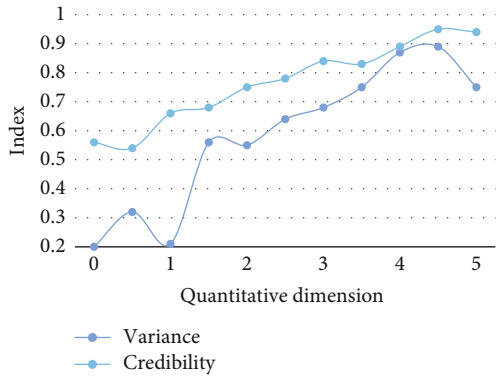

Figure 5: Analysis of variance and reliability of mankind resource management.

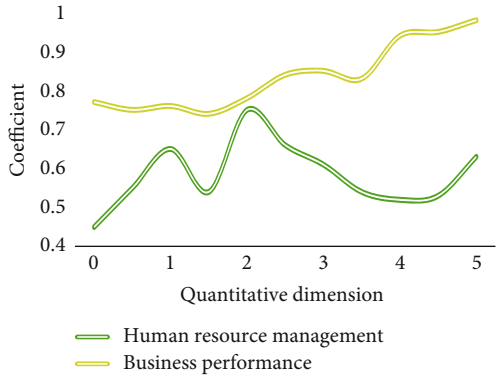

Figure 6: Correlation analysis of mankind resource management and show.

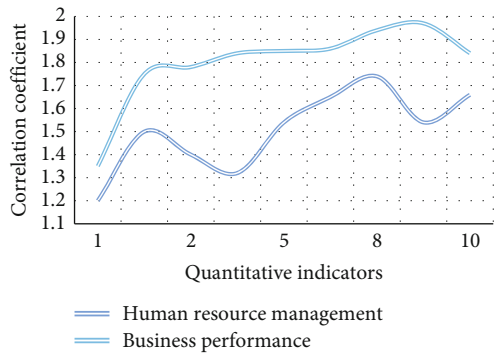

Figure 7: Regression correlation analysis between mankind resource management and enterprise show.

extent through the fusion model, but the algorithm does not solve the problem of project cold start. The fuzzy algorithm proposed in this paper mixes the content-based filtering algorithm and collaborative filtering algorithm, absorbs the advantages of the two algorithms, and uses the content-based filtering algorithm to make up for the defects of collaborative filtering algorithm in cold start. Considering that the algorithm essentially mixes the two traditional recommendation algorithms of collaborative filtering algorithm and content-based filtering, in order to prove that the recommendation algorithm based on DL is based on the traditional algorithm, and can take advantage of the advantages of DL to improve the show of the recommendation algorithm, so, it can be found that compared with the original algorithm, the design model in this paper has a 65.4% improvement in algorithm, which will greatly simplify the calculation process and improve the model processing efficiency.

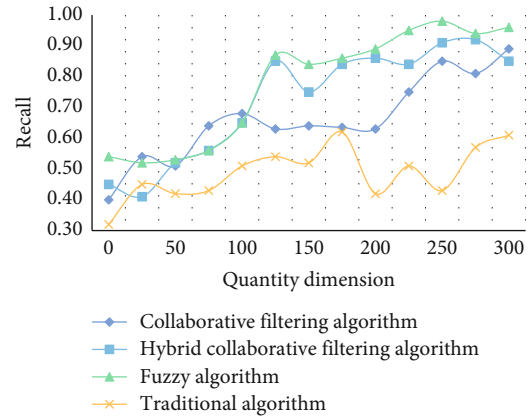

Figure 8: Comparison of recall rates of each algorithm.

5. Conclusions

This paper adopts both normative and empirical research methods to study the application of enterprise human resource management display evaluation. The efforts are culminated in the construction of an enterprise HRM display evaluation model with certain theoretical and practical implications. The aim of this paper is to study and improve DL-based HRM algorithms and apply them to the HRM domain in order to improve the status quo of traditional and single algorithms in the existing systems. With the capability of DL feature extraction, this paper overcomes the main problems in traditional collaborative filtering algorithms, such as data sparsity and cold start, and improves the efficiency of human resource management display analysis. From the utility of the model designed in this paper, it is shown to be effective in error control and efficiency improvement. It is demonstrated that DL-based recommendation algorithms are based on traditional algorithms and can take advantage of DL to improve the presentation of recommendation algorithms. Therefore, it can be found that the design model of this paper has 65.4% improvement in algorithm compared with the original algorithm, which will greatly simplify the calculation process and improve the model processing efficiency. The numerical results show that there is an inevitable linear correlation between HRM and business presentation. This indicator can reflect a 74.3% improvement in the accuracy of the model. In enterprise human resource management, performance appraisal can not only improve the enterprise's human resource management system but also optimize the allocation of human resources and improve the overall performance of the enterprise.

However, in the practice of enterprise human resource management, in order to truly play the role of performance appraisal, it is necessary to continuously analyze and summarize the implementation process of performance appraisal management. As a complete and effective performance management, it is imperative that the organization and employees realize that performance management, although it involves performance appraisal, is not ultimately about discussing or highlighting low performance but about identifying the reasons for performance and discussing the employee's achievements, accomplishments, and how they are progressing, as a help rather than a blame system. Improving individual and organizational performance and increasing organizational human capital is the ultimate goal.

Data Availability

The data used to support the findings of this study are included within the article.

Conflicts of Interest

No competing interests exist concerning this study.

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