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Research Article

Construction of Enterprise Human Resource Intelligent Scheduling Model Based on Fuzzy Relationship

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Human resource planning is to predict and analyze the quantity, quality, and structure of human resources in different historical periods, different social environments, and different development stages, so as to meet the needs of human resources enterprises to implement strategies. It ensures that the supply of human resources within the enterprise can not only meet the needs of the enterprise, but also reduce unnecessary business costs without redundancy. It enables the supply and demand of human resources in daily business operations to achieve and maintain the work balance after dynamic resource management. Human resource planning in an enterprise not only helps to improve the utilization of human resources within the enterprise. And it is an important standard for human resource management such as recruitment, promotion, and training. This paper establishes an intelligent scheduling model of enterprise human resources based on inverse relationship. The experimental results show that before the causal analysis, the business performance measurement items are tested and the sphere test is carried out. The value is 0.86, greater than 0.85, indicating that the group data are suitable for exploratory factor analysis. At the same time, the significance of the spherical test result is 0.00, which is lower than 0.01, and the null hypothesis that the correlation coefficient matrix is a unit matrix is rejected. It shows that the data are correlated and are suitable for analyzing exploratory reasons.

1. Introduction

The 21st century of globalization, marketization, and informatization is an era of coexistence of opportunities and challenges for enterprises. Enterprises not only have a variety of growth opportunities, but also face unprecedented fierce market competition. Enterprises must survive and develop in the increasingly fierce market competition. The key is speed, efficiency, and advantage. The competition between enterprises is the competition of talents. The focus of market competition will shift from the competition of key resources such as money and products to the competition of intellectual resources. The key factors affecting the competition of enterprises are the unique human resources and venture capital of enterprises, both of which are directly related to the survival and development of enterprises. When enterprise managers realize the importance of human resources, the management of internal human resources also plays an important role in the enterprise. Its status has also been upgraded from the tactical level to the strategic level, which is an important strategic implementation management task.

Most Chinese companies often ignore human resource planning when managing strategic planning. The company lacks a detailed understanding of the work-related elements such as the skills and quality of employees. It does not plan the long and short term of workers. The distribution of employees is unreasonable, the work enthusiasm is not high, the brain drain is serious, and the competition for human resources is reduced. At present, the human resource planning of domestic enterprises is still in its infancy. It is mainly reflected in the low status of human resource management in enterprise human resource management, enterprises do not pay attention to it, business personnel do not participate in human resource planning, human resource planning is lack of systematic research, and human resource planning is still in the design stage and does not pay

attention to implementation, evaluation, and feedback. Independent research enterprises have no human resource planning system or model based on their own actual situation. Nowadays, the global talent competition is becoming more and more fierce. In order to seize the space, enterprises urgently need to treat the enterprise's human resource management from a strategic perspective and clarify its importance to development.

The content and procedure of human resource planning is the basic theory of the article and the guiding theory for the construction of enterprise human resource planning model base. It provides an idea for the article to build a human resource planning model base. On this basis, this paper makes comprehensive use of grey prediction theory, Markov method, and deviation maximization multi-attribute decision-making ranking method theory. This paper explores how enterprises can use the human resource planning model base to formulate reasonable human resource planning, which enriches and further improves the theoretical system of human resource planning. This paper establishes the model of enterprise human resource planning. The human resource planning created by the model can not only provide resource support for enterprises to realize enterprise strategy but also provide an important foundation for enterprise management.

2. Related Work

In terms of fuzzy relationship and intelligent scheduling model construction of human resources, world experts also have many research results. Lukovac et al. proposed a new model of human resource combination development based on neurofuzzy method. The simulated annealing algorithm is used to establish an adaptive neural network. The model enables decision makers to assess human resource potential according to the environment and its situation [1]. Shimizu et al. found that since 1959, the human resources development center (HRDC) of the National Institute of Quantum and Radiation Science and Technology of Japan has provided various training programs covering a wide range of radiation-related technologies [2]. Joel et al. aimed to investigate how human resources policies and practices affect organizational citizenship behavior (OCB). OCB represents the additional contribution of employees to their organization and in some way represents the individual actions expected in a crisis situation [3]. Mauro et al. believed that the rapid expansion of big data analysis is forcing companies to reconsider their human resources needs. At the same time, however, it is unclear what types of job roles and skills constitute this area [4]. Masri and Jaaron A believed that green human resource management (GHRM) is a commitment to enhance environmental sustainability practices and increase employees' commitment to environmental sustainability by using human resource management (HRM) practices [5]. Razzaq et al. analyzed the human resource management practices of the best performing telecommunications organizations. That is, he took career practice planning (CPP) and compensation practice (CP) as dependent variables, while employee commitment is the independent variable [6]. These studies provide a lot of evidence for our experiments, but due to the short research time, there are some questions about the tested samples, which makes the test results need to be confirmed.

3. Related Technologies of Human Resource Scheduling

3.1. J2EE Technology. J2EE provides a good development mechanism for building an extensible, flexible, and easy to maintain system. Heterogeneous support enables J2EE portable programs to be used in heterogeneous environments. Its J2EE-based application does not depend on any specific operating system, middleware, and hardware. Therefore, once developed, a well-designed J2EE program can only be used on different platforms. Its scalable system developed using J2EE is slowly being integrated, and the newly developed applications and services can be easily added to the existing system as components. In addition, J2EE vendors also provide a wider range of load balancing strategies. It eliminates the system bottleneck, allows the integrated deployment of multiple servers, and realizes a highly scalable system to meet the needs of future commercial applications. In this paper, the scalable system developed using J2EE is slowly being integrated, and the newly developed applications and services can be easily added to the existing system as components. In addition, J2EE vendors also provide a wider range of load balancing strategies. It eliminates the system bottleneck, allows the integrated deployment of multiple servers, and realizes a highly scalable system to meet the needs of future commercial applications.

The basic architecture of J2EE is shown in Figure 1, which is mainly composed of client layer, web layer, application layer, and data layer. Java web browser and client constitute the client layer, which acts as the interface of user interaction. The web container located on the web server constitutes the web layer, which can use components such as JSP. The EJB container located on the application server corresponds to the application server layer. The web server layer and the application server layer combine to form the middle layer of J2EE architecture, which covers different software transaction logics. The data server layer includes traditional large database servers [7].

3.2. Structure of Scheduling Agent. The scheduling agent is composed of user interface module, system modeling module, scheduling decision module, information processing module, communication module, learning and evolution module, database, knowledge base, and ontology base, as shown in Figure 2. At the request of the project team management agent, this paper schedules human resources according to the scheduling model and scheduling algorithm, and returns the scheduling results to the project team management agent. When unexpected situations occur, such as task delay and rework, the scheduling agent is based on the event-driven method at the request of the project team management agent. According to the specific project

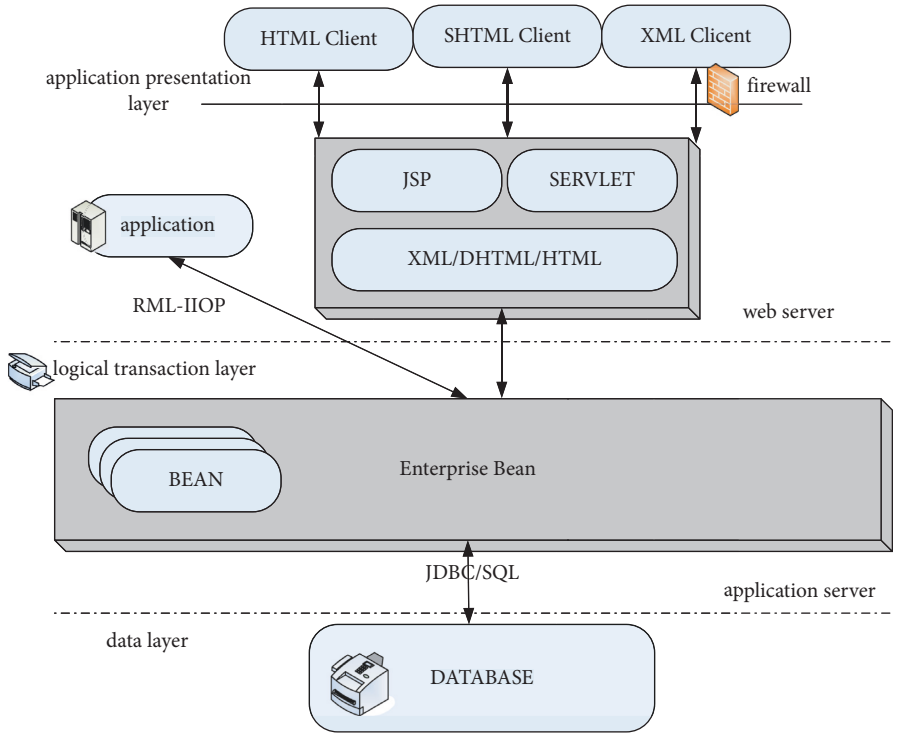


Figure 1: J2EE architecture.

situation, it calls the scheduling model and scheduling algorithm again to reschedule human resources [8].

User interface: through this module, the user can input the number, sequence, and personnel information of tasks in the initial scheduling project, as well as the adjustment information of some GA parameters in the scheduling execution process. At the same time, its scheduling agent can display various scheduling schemes obtained after reasoning and decision-making by the scheduling decision-making module in the form of Gantt chart through this interface, as well as various scheduling performance statistical charts. The scheduling decision user interface of information processing module includes ontology knowledge base, other agent database communication module, and evolution module [9]. System modeling module: this module is based on various information entered by the user, such as task quantity, sequence, and information about personnel ability and status in the database. It establishes the human resource scheduling model of the project according to certain objective functions and constraints. Scheduling decision module: this module encapsulates genetic algorithm (GA) into this module. It schedules the human resources in the project according to various information sent by the user interface module and the relevant scheduling model information in the database, and the obtained optimal scheduling scheme is used as the guiding plan of resource allocation. It reallocates resources, dynamically schedules personnel, and sends the final scheduling scheme to the user interface. Database: it stores user data and local data of the scheduling agent itself. Knowledge base: it stores all kinds of relevant knowledge processed by each module, such as project task quantity, sequence relationship, task requirements, resource association constraints, task execution information, status information, personnel status information, various scheduling models, various optimal scheduling schemes, and performance indicators.

3.3. Development Platform of Agent—Grasshopper. In order to quickly build HRMS software system based on multi-agent, we should find the existing agent development platform suitable for the system architecture, rather than developing from scratch. It is an effective shortcut. In view of the discussed agent organization structure, the cooperation mechanism between agents, and some other requirements of the software system, this paper selects the agent development platform grasshopper according to the following principles. The relationship between entities in the system is shown in Figure 3 [10].

At present, the personnel scheduling mainly depends on the experience of the project manager. It is often affected by some subjective factors and lacks scientificity, resulting in the extension of project cycle and increase of cost. In each project team, due to the different progresses of the project, there are some temporary surplus personnel and tasks. Due to the inaccurate project scheduling and untimely information communication among various project teams, the surplus personnel are idle, the technicians cannot give full play to their talents, and the surplus tasks cannot be completed in time, resulting in great waste. Aiming at the problems existing in enterprises, this paper establishes the human resource scheduling model in software projects based on genetic algorithm and the human resource redistribution model based on market mechanism. The

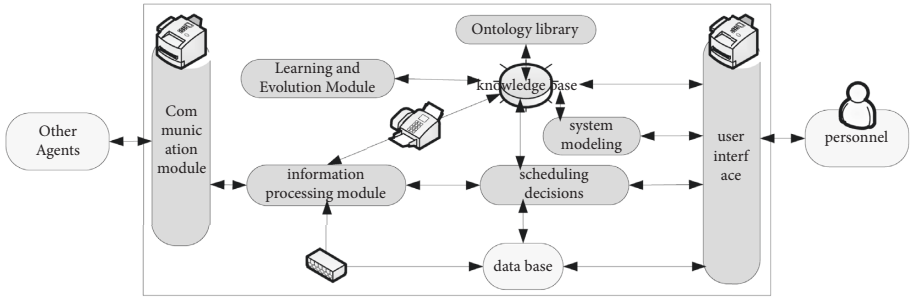


Figure 2: Scheduling agent structure.

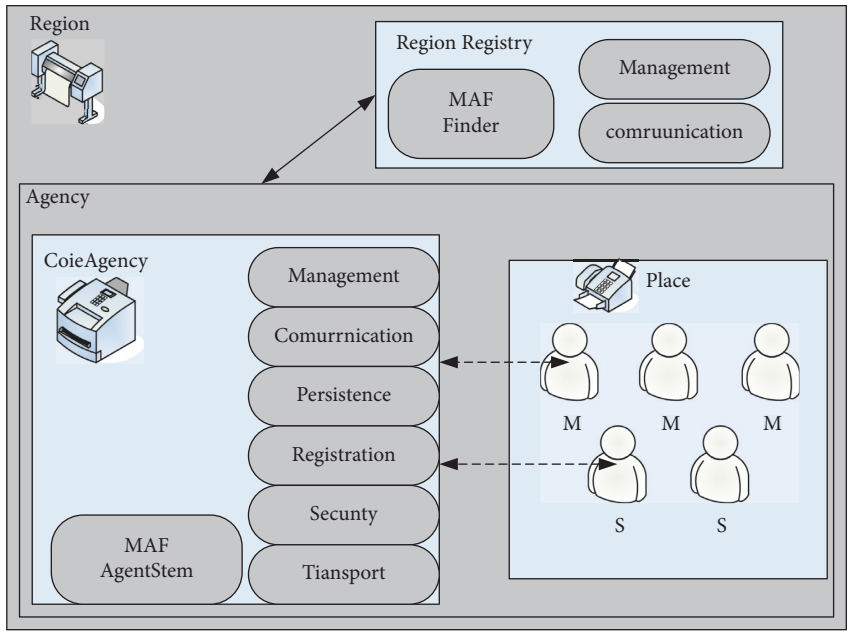


Figure 3: Relationships between entities in the grasshopper system.

verification results are shown in Table 1. It schedules some historical projects and ongoing projects of an information technology Co., Ltd., and compares them with the results obtained by the project manager according to experience. Among them, there are 2 historical projects, and 2 current projects include enterprise informatization projects, 2 e-government projects, and 2 campus informatization projects, as shown in Figures 4 and 5 [11].

The results show that the scheduling obtained according to the human resource scheduling model significantly shortens the project cycle. It has shortened the cycle of each project by 24.3% on average, thus reducing the project cost, and the overall direct cost is reduced by 24.6%. This paper uses this system to effectively solve the problems in human resource scheduling. If no one in the project team can complete some tasks during scheduling, it is assumed that there is a person who can complete the task according to the task standard. And the person only does the task during this period of time. After the scheduling is completed, the project team will be notified to the management agent to call the human resources redistribution agent to temporarily transfer into other project teams the surplus personnel who can complete the task as required. If the task requirements cannot be met at this time, new employees will be recruited into the project team and rescheduled. In a scheduling cycle that has completed optimal scheduling and is in the process of execution, an emergency task with higher priority is inserted into the current scheduling set. Scheduling agent first rearranges the relationship between the task and the tasks that are not executed in the current scheduling center, and puts the urgent task at the forefront. If there are more urgent tasks, they will determine the priority according to their urgency, determine their priority accordingly, and run the scheduling algorithm for rescheduling. When a project task is cancelled, the sequence of other tasks and the use of resources in the corresponding project may also change. Therefore, the scheduling agent should be called again to reschedule it. If an employee asks for leave or leaves during project implementation, which affects the project tasks undertaken, the most direct way is to reorder and reschedule the subsequent tasks. If the project cycle scheduled at this time exceeds the latest completion date, it will notify the project team management agent to call the human resources redistribution agent to temporarily transfer the surplus personnel who can complete

Table 1: Human resource scheduling comparison table.

	Project cycle reduction rate TD (%)	Project cost reduction rate CD (%)
History item 1	16.7	23.3
History item 2	24.4	24.5
Enterprise informatization project 1	28	23.6
Enterprise informatization project 2	20	19.9
E-government project 1	23.6	22
E-government project 2	27.9	23.7
Campus informatization project 1	24	29
Campus informatization project 2	30	24.6

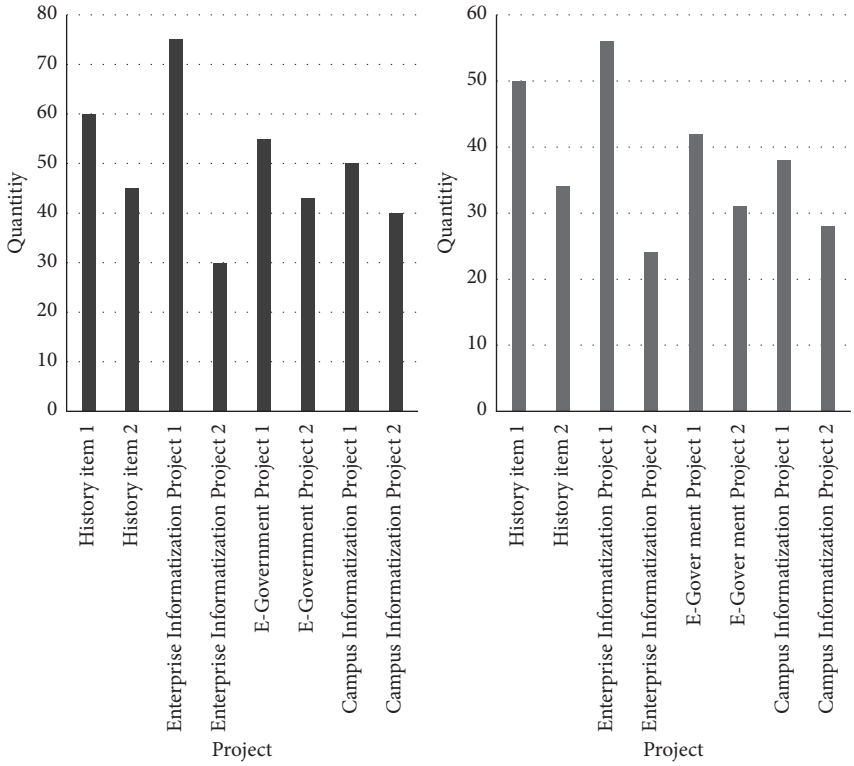


Figure 4: Project cycle ET (weeks) based on empirical scheduling.

the task in other project teams. If the task requirements cannot be met at this time, new employees will be recruited into the project team and rescheduled. If a project task is delayed for some reason and affects the execution of subsequent scheduled project tasks, the task agent first notifies the project team management agent to cancel the association between the current subsequent tasks and relevant personnel, and then re-adjust the subsequent project tasks [12]. If the project cycle scheduled at this time exceeds the latest completion date, inform the project team management agent to call the human resources redistribution agent to temporarily transfer the surplus personnel who can complete the task in other project teams. If the task requirements cannot be met at this time, new employees will be recruited into the project team and rescheduled. The application results show that the model can quickly realize the automatic redistribution of human resources. It improves the personnel utilization rate from 75% to 90%, which helps to reduce the project cost, shorten the project cycle, and bring economic benefits to the enterprise [13].

HRMS system adopts multi-layer component-based distributed structure. It has good scalability, flexibility, and sustainability, and the submission layer can be a browser supporting hypertext transfer protocol HTML or Java applet. It connects to the web server via HTTP or HTTPS. The web server uses the standard remote invocation (RMI) or RMI-IIOP protocol. The client can also be a stand-alone Java application that communicates directly with the application server through RMI or RMI-IIOP. Application server, the so-called intermediate product or logical business layer, is the core part of HRMS framework. It can access the database through JDBC and integrate with legacy system, existing system, and ERP system through CORBA and other private protocols. Its structure is shown in Figure 6 [14].

4. Multiproject and Multiskill Human Resource Scheduling Problem and Mathematical Model

The phenomenon of multiskilled human resources is very common in software, construction, and other industries. Software enterprises, especially large and medium-sized software enterprises, account for a very high proportion of human resources costs, and multiskill phenomenon is very common. For example, programmers can use C, C++, Java, and other programming languages. They can also act as architects or test engineers. In foreign countries, through project management, human resource scheduling algorithm, and its software, the full utilization of human resources among multiple projects is realized. Some studies show that it can effectively shorten the construction period and reduce the cost by 20%–50%. For example, Microsoft Corporation of the USA has a group of project management elites and has realized the optimal scheduling of multiskilled staff resources [3].

The mathematical model of resource-constrained multiproject and multi-skill human resource scheduling problem under generalized priority relationship is as follows:

$$\begin{aligned}
&\min b_N,\\
&st.\sum_{t=1}^{T} z_{at} = 1, \quad \forall a \in A,\\
&\quad b_a = \sum_{t=1}^{T} t \cdot z_{at}, \quad \forall a \in A,\\
&\quad bj \geq bi + 1ij, \quad \forall (i,j) \in E, i, j \in A,\\
&\quad \sum_{a=1}^{N}\sum_{s=1}^{g} x_{\text{atsk}} \leq 1, \quad \forall k \in R, \forall t = \{1,\ldots,T\},\\
&\text{rasq} \leq \sum_{k=1}^{m} x_{\text{aqsk}} \cdot m_{ks}, \quad \forall a \in A \forall s \in S \forall q \in \{ba,\ldots,ba+da-1\},\\
&x_{\text{atsk}} \in \{0,1\}, \quad \forall a \in A \forall t = 1,2,\ldots,T, \forall s \in S, \forall k \in R,\\
&\quad z_{at} \in \{0,1\} n \forall a \in A \forall t.
\end{aligned} \tag{1}$$

Thus, the proficiency matrix of skilled workers relative to tasks is

$$\text{SKILL} = \begin{bmatrix} \text{skill}_{11} & \ldots & \text{skill}_{1m} \\ \ldots & \ldots & \ldots \\ \text{skill}_{n1} & \ldots & \text{skill}_{nm} \end{bmatrix}. \tag{2}$$

Their proficiency is relative to the task, and

$$\begin{aligned}
&\text{skill}_{ij} = \left(\sum_{v=1}^{k} tvt \cdot wvt \right),\\
&\text{when } q_{vj} > t_{vi},\\
&\quad \text{let } q_{vj} = t_{vi}.
\end{aligned} \tag{3}$$

In order to better describe which task skilled workers are engaged in, the work assignment matrix is defined as

$$\begin{aligned}
&RA = \begin{bmatrix} ra_{11} & \ldots & ra_{1m} \\ ra_{n1} & \ldots & ra_{nm} \end{bmatrix},\\
&\sum_{i=1}^{m} ra_{ij} > 0; \quad j = 1,2,\ldots,n,\\
&\text{skill}_{ij} > \varepsilon_i; \quad i = 1,2,\ldots,m; j = 1,\\
&\quad t_{si} d_i t_{fi}; \quad i = 1,2,\ldots,n.
\end{aligned} \tag{4}$$

When $a_{ij} = 1$,

$$\begin{aligned}
&\sum_{i=1}^{n}\sum_{l=1}^{m} ra_{ij} > 0,\\
&ra_{ui} = ra_{uj}; \quad u = 1,2,\ldots,m,\\
&\quad t_{fi} \leq t_{sj}.
\end{aligned} \tag{5}$$

Namely,

$$\begin{aligned}
&\text{makespan}_{\text{nonm}} = \frac{\max(\text{makespan}) - \text{makespan} + 1}{\max(\text{makespan}) - \min(\text{makespan}) + 1},\\
&\text{cost}_{\text{nonm}} = \frac{\max(\text{cost}) - \text{cost} + 1}{\max(\text{cost}) - \min(\text{cost}) + 1},\\
&F = W1 \cdot \text{makespan}_{\text{nonm}} + W2 \cdot \text{cost}_{\text{nonm}}.
\end{aligned} \tag{6}$$

5. Empirical Multiproject Human Resource Scheduling

The theoretical principles presented in the research design were preliminarily verified in earlier literature research, interview research, and case study. However, the size of the sample in interview and case studies is restricted, and there may be issues with external validity; whether the study conclusions can be popularized has to be determined. Furthermore, the interviewers' subjective emotions may be inadvertently invaded, which may impair the study's validity to some extent. The questionnaire research can develop more thorough results by collecting data and statistically analyzing large samples, thus compensating for the aforesaid flaws. The questionnaire method is a research method that uses carefully planned measurement items or questions to collect research materials and data from research objects in written form. The research idea is based on the original theoretical notion, which is further adjusted and refined in this work, as well as the relevant conclusions of interview research and case study. The world's most mature questionnaire is used in the majority of research questionnaires. On the basis of large-scale sampling, a more thorough and objective conclusion is expected. A total of 300 questionnaires were distributed, and 247 were recovered, resulting in an 82.3 percent recovery rate, with 203 effective questionnaires accounting for 67.7% of the total. The scenario is good in general. Table 2 summarizes the findings. The questionnaire is mostly filled out by the company's middle and senior management. Table 3 shows that the respondents to

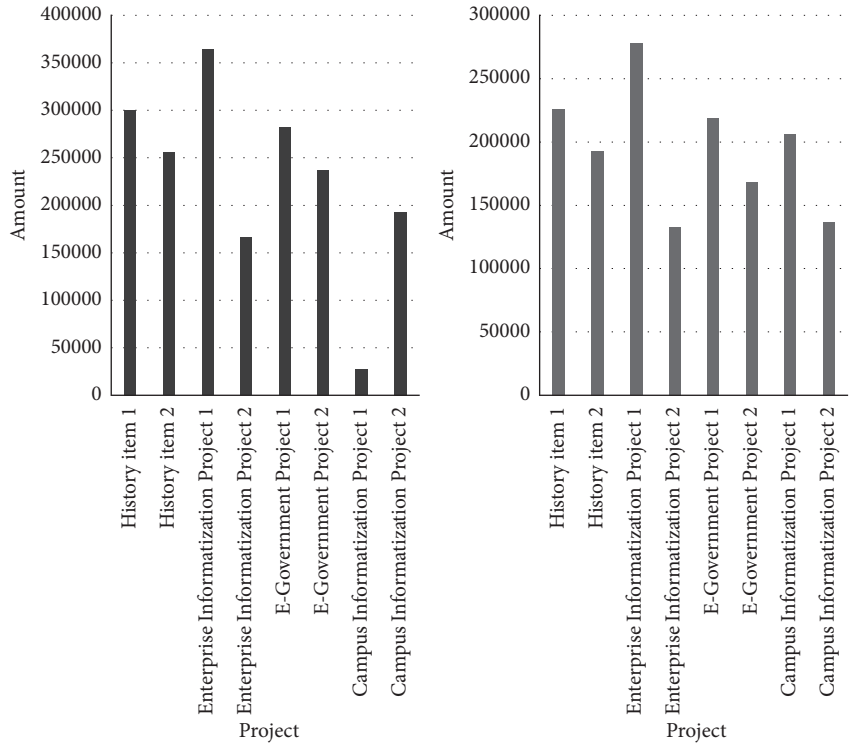


Figure 5: Project cost EC (yuan) based on experience scheduling.

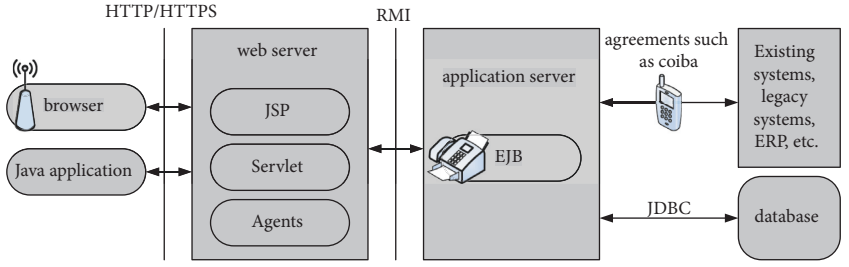


Figure 6: Implementation framework of human resource management system based on multi-agent.

the survey are primarily undergraduates, master's degree holders, and middle and senior managers in position level, and 60% of them have worked for more than 5 years [15].

The collection of basic information of enterprises and respondents is very important to ensure the rigor and integrity of follow-up research. For example, in the research, the working years of the respondents in the enterprise may affect the person organization matching assistance of the enterprise to a certain extent. In addition, enterprises of different types and sizes may also differ in the specific structure of organizational dynamic capability [16]. According to the basic principles of questionnaire design and the theoretical conception of the research, this paper determines the basic information of enterprises and individuals to be collected. The basic information of the enterprise collected in this paper includes enterprise name, enterprise nature, year of establishment, number of employees, sales of the previous year, industry, development stage, etc. The basic information of the questionnaire respondents includes gender, education background, age, position level, working years in the company, etc. According to the needs of previous research and research, this paper gives a specific operational definition for the items that need the subjective evaluation of the filler, such as the stage of enterprise development. It is convenient for the preparers to judge and facilitate the unification of follow-up research [17].

In the factor analysis, the factors extracted in this paper should not only consider the theoretical conception, but also consider the data structure. In this paper, the principal component method of factor analysis is used to extract the factors with characteristic root value greater than 1, and the factor structure of enterprise human resource strategy is obtained by rotating the maximum variance of the factors. There are four factors named recruitment and selection, training and development, employee participation, and performance compensation. In total, it explained 65.3% of the variation. The specific results are shown in Tables 4 and 5 [18].

Table 2: Descriptive statistics of the basic situation of sample enterprises.

Variable	Category		Number frequency	Ratio percentage
Enterprise nature	State-run		53	26.1
	Collectively owned		13	6.4
	Private		78	39.54
	Foreign investment		46	21.5
	Listed company		19	8.9
Business age	1–5 years		45	24.45
	5–10 years		56	28.89
	10–20 years		57	29.59
	20+ years		23	18.54
Number of employees (enterprise size)	1–50 people	Miniature	35	18.58
	50–100 people	Small	95	45.69
	100–500 people	Medium	48	22.6
	500+ people	Large	24	13.45
Stage	Start-up		28	15.5
	Growth period		91	44.5
	Maturity		63	31.5
	Transition period		258	12.2
Industry	Processing and manufacturing		56	25.98
	Service industry		83	40.56
	High-tech industry		44	21.58
	Commercial circulation enterprises		29	12.3

Table 3: Descriptive statistics of the basic situation of the respondents.

Variable	Category	Number of people frequency	Ratio percentage
Gender	Male	125	61.47
	Female	76	38.9
Education	High school and below	15	5.9
	College	59	28.96
	Undergraduate	115	55.9
	Master degree and above	26	10.5
Occupation class	General staff	27	14.56
	Grassroots managers	38	19.5
	Middle managers	59	27.56
	Top management	84	39.4
Working years	1–3 years	46	22.69
	3–5 years	38	17.58
	5–10 years	42	31.47
	10+ years	59	29.5

Through exploratory factor analysis and confirmatory factor analysis, this paper verifies that the enterprise human resources strategy consists of four strategies: recruitment and selection, training and development, employee participation, and performance compensation. The hypothesis has been verified. As can be seen from Figure 7, the average value of enterprise human resource strategy and its four dimensions are at the upper middle level. The standard deviation of the four dimensions and the overall human resources strategy of the enterprise is moderate, indicating that its dispersion is not large. The evaluation of explanatory variables is relatively consistent, and it has a certain degree of discrimination [19].

As can be seen from Figure 8, the average value of each dimension of organizational dynamic ability is at the upper middle level, in which the scores of opportunity recognition ability and change response ability are basically the same, while the score of resource integration ability is slightly higher. The standard deviation of the variable is moderate, indicating that the dispersion is small, the evaluation is relatively consistent, and it has a certain degree of discrimination [20].

Correlation refers to that there is a certain relationship between the distribution and size of two variables, but the direction of the relationship is uncertain; that is, the causal relationship between the two variables cannot be determined. On the basis of descriptive statistics, in order to better understand the relationship between variables and within variables, there is a significant positive correlation between the four dimensions of human resource strategy of relevant enterprises. It shows that there is a close relationship between various factors of enterprise human

Table 4: Exploratory factor analysis of enterprise human resource strategy.

Enterprise human resource strategy	Factor load	
	Factor 1	Factor 2
Factor 1 $a = 0.89$	Explain variation	
A1 The company pays attention to the evaluation of professional knowledge and professional experience in the recruitment and selection of employees.	0.72	0.15
A2 During the recruitment process, the company will invite candidates to meet with the employing department.	0.69	0.15
A3 The company strives to make candidates understand their job responsibilities during the recruitment process.	0.68	0.15
A15 The company tends to recruit candidates with strong teamwork skills.	0.75	0.25
A5 The company tends to recruit candidates who agree with the company's goals.	0.74	0.25
A21 The company attaches great importance to the development potential of new employees.	0.63	0.35
Factor 1 $a = 0.85$	Explain variation	
The company's training design, the main purpose is to improve performance.	0.26	0.62
The company emphasizes rules, regulations, and procedures for employee training activities.	0.15	0.57
The company's consideration of training needs is mainly based on the assessment of employee skills.	0.03	0.65
The company implements the system of "master leads apprentices" to guide the work of employees.	0.15	0.60
The company's training and education programs effectively improve employee skills.	0.02	0.63
Employees of the company are satisfied with the quality of the training and development programs.	0.01	0.68
The company's training and development activities emphasize long-term goals.	0.35	0.54

Table 5: Other factors.

Factor 3 $a = 0.90$	Explain variation	
The unit I work pays attention to the opinions of employees.	0.30	0.23
My organization allows employees to make decisions.	0.16	0.18
My organization focuses on suggestions made by employees to improve the way they work.	0.26	0.31
In my unit, the communication between employees and superiors is smooth.	0.26	0.24
Factor 4 $a = 0.89$		
In this enterprise, performance is usually quantitatively evaluated based on objective results.	0.26	0.26
The company's performance evaluation of employees is usually based on the department's performance.	0.24	0.18
In my unit, employee bonuses are tied to the organization's profits.	0.25	0.14
In my organization, employee salaries are closely linked to individual or team performance.	0.25	0.15

resources strategy, but the correlation coefficient is not particularly large, indicating that they are not high enough to replace each other. At the same time, there is also a significant positive correlation between the enterprise human resource strategy and its four dimensions, indicating that these four dimensions can jointly represent the enterprise human resource strategy. There is also a significant positive correlation between the three dimensions of organizational dynamic capability, indicating that there is a close relationship between the factors of organizational dynamic capability. However, the correlation coefficient is not particularly large, indicating that they are not high enough to replace each other. At the same time, there is also a significant positive correlation between organizational dynamic capability and its three dimensions, indicating that these three dimensions can jointly represent organizational dynamic capability [21].

As can be seen from Figure 9, there is no significant difference in organizational dynamic capability between enterprises with different ownerships. However, compared with state-owned enterprises and private enterprises, foreign-funded enterprises show higher ability to identify opportunities. This may be because foreign-funded enterprises have relatively perfect department settings and program design for environmental scanning and opportunity identification. In addition, in the three dimensions of organizational dynamic ability, generally speaking, the scores of foreign enterprises are higher than those of private enterprises, and the scores of private enterprises are higher than those of state-owned enterprises. This paper will further discuss this issue in the result discussion part [22].

The analysis of variance of human resource strategy in the industry of the enterprise is summarized as follows. As can be seen from Figure 10, the human resource strategy score of high-tech industry is significantly higher than that of the other three industries. In the specific human resource strategy, the scores of employees' participation in high-tech industry are also significantly higher than those of the other three industries. This may be because enterprises in the high-tech industry pay more attention to the role of employees, so they will pay more attention to employee participation. In addition, on the whole, the scores of commercial circulation enterprises in recruitment, training and development, and performance compensation are higher than those in processing and manufacturing and service industries.

6. Discussion

On the basis of previous theoretical discussion, this paper uses a variety of research methods to discuss and analyze, and this paper is supported by a certain representative

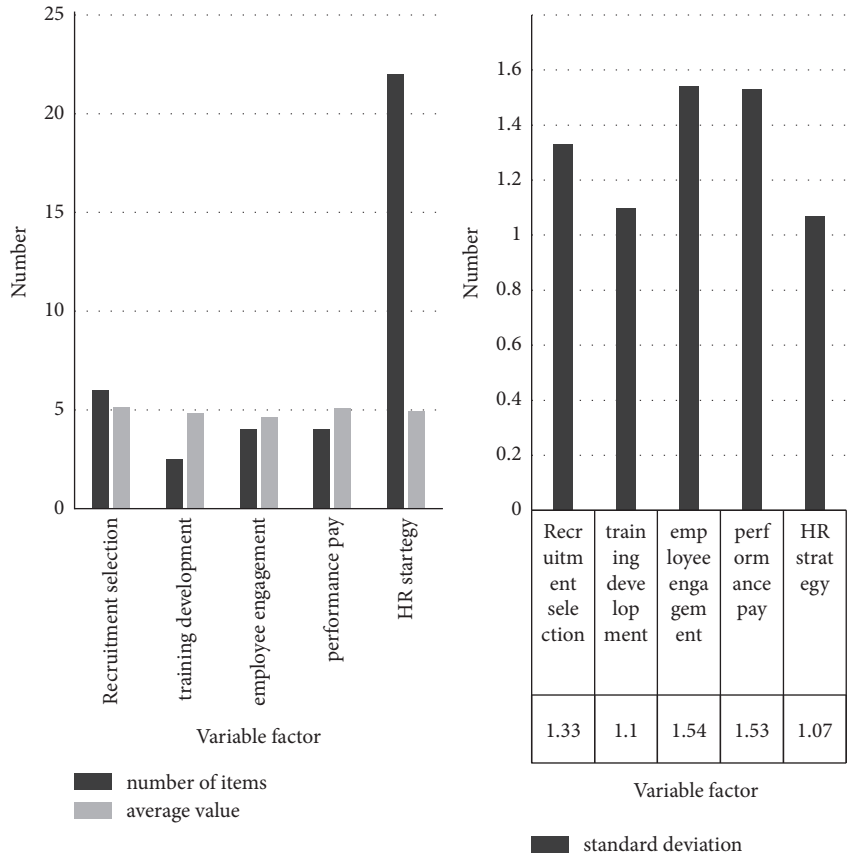


Figure 7: Descriptive statistics of corporate HR strategies.

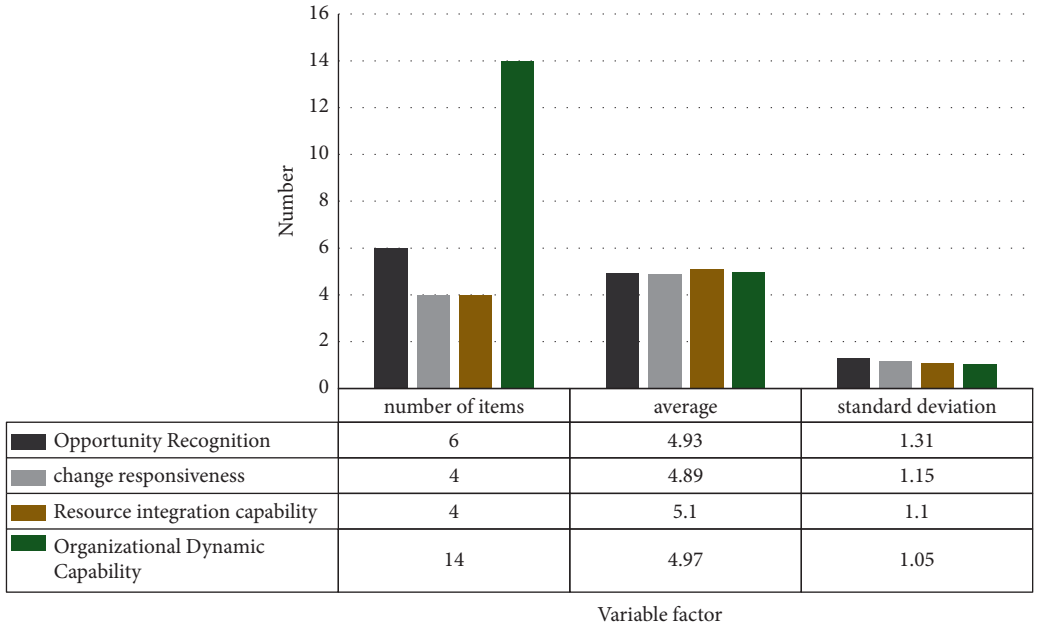
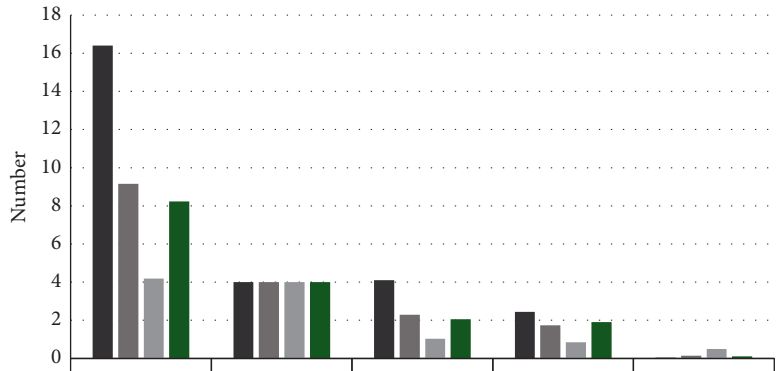


Figure 8: Descriptive statistics for organizational dynamic capabilities.

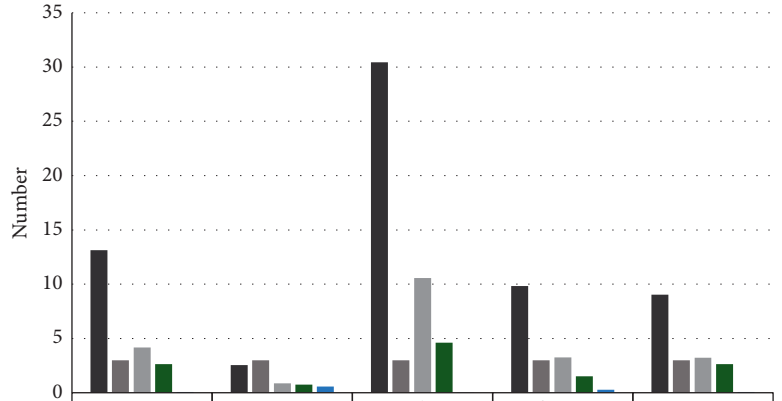
sample enterprise data. Theory comes from practice, and it should return to practice to be tested by practice. In order to discuss and test the conclusions of this study in a wider range, based on the attitude of "throwing bricks to attract jade," according to the conclusions of the study and combined with the problems of some enterprises in the survey, some management countermeasures are put forward [23].



	variance	degrees of freedom	mean variance	F value	significance coefficient
Opportunity Recognition	16.4	4	4.1	2.44	0.048
change responsiveness	9.15	4	2.29	1.74	0.141
Resource integration capability	4.18	4	1.04	0.85	0.501
Organizational Dynamic Capability	8.24	4	2.06	1.91	0.11

Variable

Figure 9: ANOVA of firm nature on organizational dynamic capabilities.



	Recruitment selection	training development	employee engagement	performance pay	HR strategy
Opportunity Recognition	13.14	2.56	30.45	9.84	9.03
change responsiveness	3	3	3	3	3
Resource integration capability	4.18	0.86	10.56	3.263	3.23
Organizational Dynamic Capability	2.64	0.75	4.61	1.51	2.64
significance coefficient	0.059	0.562	0.002	0.264	0.056

Variable

Figure 10: Analysis of variance for HR strategies by industry.

In the process of interview research, case study, and questionnaire, the author found that the human resources strategy of some enterprises is not very perfect. There is still a certain gap between it and the high-performance work system proposed in the theory. The human resource strategy of some enterprises is still in the primary stage of personnel management. It is necessary for enterprises to realize that human resources are the first resource of enterprises. In today's knowledge economy, the competition between enterprises is actually the competition of talents. It is necessary for enterprises to improve their understanding of the importance of human resources work and understand enterprise human resources management from the perspective of building enterprise sustainable competitive advantage. It is found that human resource strategy plays an important and direct role in organizational dynamic capability, which

directly affects all aspects of enterprise performance. Therefore, human resource management should become an important and conscious action for enterprises to build their own competitive advantage. According to different human resource strategies, the views and behaviors of some enterprises also have further improvement. For example, enterprises generally pay more attention to performance evaluation, salary, and welfare, while ignoring the training and development project as a cost. The study found that enterprises can not only enhance the organizational dynamic ability by recruiting and selecting appropriate personnel, but also improve the skills of existing staff through training and development, so as to enhance the organizational dynamic ability. In addition, human resource strategies such as employee participation are considered to have no direct contribution to enterprise performance. In fact, by giving full play to the initiative of employees, they can greatly improve their work attitude, and enhance and improve people organization matching, so as to promote organizational dynamic ability and enterprise performance.

In the study, enterprises with different ownerships, different scales, and different industries do not show obvious differences in organizational dynamic ability. This may be due to the limitations of research sampling, or the division of enterprises is not detailed enough. In the actual operation of enterprises, enterprises should pay attention to the reasonable construction of organizational dynamic capability according to their own characteristics and development requirements. For example, enterprises in the start-up stage should put more energy into the construction of opportunity recognition ability. By systematically scanning the external environment, it can better identify the opportunities and threats brought by environmental changes and take corresponding measures. For enterprises that have developed to a certain scale, they should focus on the ability of resource integration. It systematically responds to the challenges brought by environmental change by making better use of its own and available external resources. The division of responsibilities should be clear and consistent, especially in the establishment of a sound management system. The study found that enterprises in the start-up stage have significantly lower opportunity recognition ability than enterprises in the other three development stages. This is because these enterprises rely more on a few people such as entrepreneurs or entrepreneurial teams, rather than the organization and organizational ability as a whole. Compared with state-owned enterprises and private enterprises, foreign enterprises have higher ability to identify opportunities. It also illustrates the importance of building organizational capabilities through standardized management processes rather than relying on a few people. Foreign enterprises are slightly less familiar with China's environment than state-owned enterprises and private enterprises, but it is precisely because they have relatively mature and standardized management processes that not only effectively make up for their own defects, but also surpass state-owned enterprises and private enterprises.

7. Conclusion

Based on previous studies, this paper systematically discusses the performance of enterprise human resource strategy, organizational dynamics, man-machine matching, literature research, interview research, case study, problem research, and other research methods. As an enterprise human resource strategy to improve the dynamic organizational ability and performance of enterprises, it gives priority to several human resource strategies: recruitment and selection, and training and development. Enterprises in different industries have different human resource strategies. The structure of organizational dynamic capability mainly includes three dimensions: the ability to identify opportunities, the ability to deal with changes, and the ability to integrate resources. For enterprises with different ownerships and growth stages, enterprise human resource strategy has an impact on the improvement of enterprise performance and innovation performance. This task is mainly accomplished through recruitment, selection, training, and the formulation of human resources strategy. The study does not support the direct impact of performance. The dynamic capability of an organization and its three dimensions can improve business performance, operational performance, and innovation performance, which have different effects on different dimensions. Among them, it can identify opportunities and integrate resources to promote business performance, identify opportunities, reshape responsiveness to improve performance innovation, identify opportunities, and integrate resources to promote business performance. The human resource strategy of an enterprise can highlight the dynamic ability of the organization and its three dimensions. The role of enterprise human resource strategy in organizational dynamic capability is mainly realized through recruitment, selection, and training and development. The dynamics of organizational capability and its three dimensions mediate the evolution of enterprise human resource strategy to enterprise performance, operation performance, and innovation performance. Among them, the regulatory role of tissue matching has been partially verified. Although the moderating effect of better matching between individuals and organizations has been confirmed in interviews and case studies, it has not been supported by statistical analysis data.

Data Availability

The data used to support the findings of this study are available from the corresponding author upon request.

Conflicts of Interest

The author does not have any possible conflicts of interest.

References

[1] V. Lukovac, D. Pamucar, M. Popovic, and B. Dorovic, "Portfolio model for analyzing human resources: an approach based on neuro-fuzzy modelling and the simulated annealing

algorithm," *Expert Systems with Applications*, vol. 90, pp. 318–331, 2017.

[2] Y. Shimizu, H. Iida, and M. Nenoi, "Trends of training courses conducted in the human resources development center of the national Institute for quantum and radiological science and technology after the fukushima dai-ichi nuclear power plant accident," *Health Physics*, vol. 113, no. 1, pp. 66–70, 2017.

[3] T. Joel, V. C. Luciano, and V. Almir, "The impact of human resources policies and practices on organizational citizenship behaviors," *Brazilian Business Review*, vol. 14, no. 6, pp. 636–653, 2017.

[4] A. D. Mauro, M. Greco, and M. Grimaldi, "Human resources for Big data professions: a systematic classification of job roles and required skill sets," *Information Processing & Management*, vol. 54, no. 5, pp. 807–817, 2017.

[5] H. A. Masri and A. A. M. Jaaron, "Assessing green human resources management practices in Palestinian manufacturing context: an empirical study," *Journal of Cleaner Production*, vol. 143, pp. 474–489, 2017.

[6] S. Razzaq, A. A. K. Muzaffar, and A. Kashmir, "The impact of human resources management practices on employee commitment: evidence from Pakistan telecom sector," *Social Science Electronic Publishing*, vol. 7, no. 7 7, pp. 2222–6990, 2017.

[7] I. Muda, D. Y. Wardani, and Erlina, "The influence of human resources competency and the use of information technology on the quality of local government financial report with regional accounting system as an intervening," *Journal of Theoretical and Applied Information Technology*, vol. 95, no. 20, pp. 5552–5561, 2017.

[8] J. Chen, Y. Zhang, L. Wu, T. You, and X. Ning, "An adaptive clustering-based algorithm for automatic path planning of heterogeneous UAVs," *IEEE Transactions on Intelligent Transportation Systems*, vol. 1, pp. 1–12, 2021.

[9] B. Lusarczyk, "Prospects for the shared services centers development in Poland in the context of human resources availability," *Polish Journal of Management Studies*, vol. 15, no. 1, pp. 218–231, 2017.

[10] M. Al-Lozi, R. Almomani, and S. I. S. Al-Hawary, "Talent management strategies as a critical success factor for effectiveness of human resources information systems in commercial banks working in Jordan," *Global Journal of Management and Business Research*, vol. 18, no. 1, pp. 31–43, 2018.

[11] A. Ndayambaje, R. Anderson, and C. M. Yoder, "Human resources for health (hrh) midwives mentoring program and episiotomy rates at muhima hospital, Rwanda: a retrospective cross-sectional study," *Rwanda Medical Journal*, vol. 74, no. 2, pp. 7–11, 2017.

[12] M. Israr, "A survey and analysis of the relationship between human resources management and organizational performance," *Engineering, Technology & Applied Science Research*, vol. 7, no. 6, pp. 2200–2204, 2017.

[13] S. M. Kadochnikov and A. A. Fedyunina, "The impact of financial and human resources on the export performance of Russian firms," *Economic Systems*, vol. 41, no. 1, pp. 41–51, 2017.

[14] D. M. Khairina, S. R. Maharani, and H. R. Hatta, "Decision support system for admission selection and positioning human resources by using naive bayes method," *Advanced Science Letters*, vol. 23, no. 3, pp. 2495–2497, 2017.

[15] M. E. Pratiwi, M. Din, R. Masdar et al., "Utilization of information technology to increase human resources capacity and internal control systems on local government financial reporting information," *Universal Journal of Accounting and Finance*, vol. 10, no. 1, pp. 191–199, 2022.

[16] I. N. M. Jodeh, "The effect of the human resources cycle in improving the effectiveness of the accounting information system in Jordanian banks," *Accounting*, vol. 7, no. 6, pp. 1417–1424, 2021.

[17] B. D. Yun, "A study on securing human resources for the future development of the Korea coast guard," *Korean Association of Maritime Police Science*, vol. 11, no. 1, pp. 179–202, 2021.

[18] E. Nurani, "Micro medium and small a enterprise human resources' creativity in west Java through intellectual property rights (IPR) license in the pandemic covid-19 situation," *Turkish Journal of Computer and Mathematics Education (TURCOMAT)*, vol. 12, no. 4, pp. 684–694, 2021.

[19] C. Hamashima, S. Sasaki, S. Hosono, K. Hoshi, T. Katayama, and T. Terasawa, "National data analysis and systematic review for human resources for cervical cancer screening in Japan," *Asian Pacific Journal of Cancer Prevention*, vol. 22, no. 6, pp. 1695–1702, 2021.

[20] P. Tri, "High quality human resources development to satisfied the globalization in Vietnam: defiances and solutions," *Psychology*, vol. 58, no. 2, pp. 01–12, 2021.

[21] A. M. Asfahani, "The complementary relationship between human resources accounting and human resources information system," *Open Journal of Accounting*, vol. 10, no. 02, pp. 30–41, 2021.

[22] S. Papineni, A. M. Reddy, and S. Yarlagadda, "An extensive analytical approach on human resources using random forest algorithm," *International Journal of Engineering Trends and Technology*, vol. 69, no. 5, pp. 119–127, 2021.

[23] Irfansyah, "The duties and functions performance of aceh human resources improvement institutions in scholarship study program implementation in aceh government," *Britain International of Humanities and Social Sciences (BIoHS) Journal*, vol. 2, no. 1, pp. 160–165, 2020.