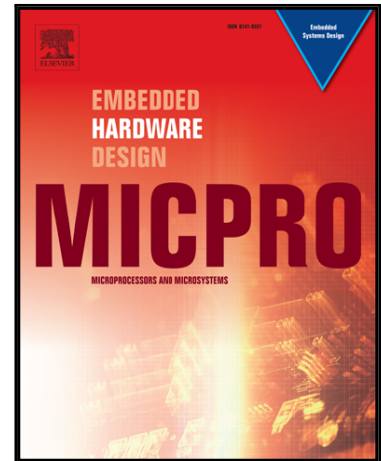


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# Enterprise human resource management platform based on FPGA and Data mining

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## Abstract

Optimal allocation management of corporate human resources is achieved to increase the efficiency of proposed Adaptive neural network optimal allocation model based on the FPGA design and information mining control of corporate HR, and versatile distribution of high business Human Resources (HR). The analysis and processing tool that build a database model of an optimized configuration of a company's human resources are used to build a report of an optimized configuration table model of a company's human resources. Statistical regression analysis is used by corporate talent. The ideal distribution measure is multidimensional data combination and highlight extraction. FPGA control strategies and information mining use data recovery and multidimensional information which is stacking to optimize the composition of enterprise talent using large-scale data fusion methods to make enterprise talent management decisions. The results show that by utilizing this strategy, the data combination capacity of the organization's ideal distribution of HR management is high, and the organization's capacity to ideally apportion HR is solid. It understands the designation and location of corporate HR and has superb application esteems for ideal allotment and the executives of corporate HR.

**Keywords:** FPGA, Data mining, Enterprise human resources; Optimized configuration.

## 1. Introduction

The improvement of a thorough corporate development requires a multidimensional investigation and choice help model of the venture upgraded to understand the staffing, human resource development, establishment of the overall operation of the enterprise. It proposes a system combined data warehouse and FPGA technology that models a personnel system and a human resources composition model for a company whose design is optimized based on the system. To build multi-dimensional investigation and dynamic work force, corporate workforce booking and the executive's model are combined. Corporate human resources, big data integration technology, hire corporate human resources, optimize the configuration of corporate human resources Optimized design, optimized management and improvement of human resources Research on the decision-making ability of resource systems and the decision-making system in human resources management of related companies has attracted a great deal of attention.

Integration and optimization, decision-making is based on the optimal allocation of corporate human resources. In this optimal allocation is combined with corporate talent technology, and big data integration is to design the integration of corporate talent information. This model designs an optimized configuration model for enterprise talent based on data mining and proposes an optimized configuration method for enterprise talent and data mining based on particle FPGAs combined with a data warehouse. First of all, online analysis and processing tools are used in the form of reports to build desktops for optimizing a company's human resources. The compilation methods are used to provide reading and editing control of optimally configured information for corporate personnel, thereby improving the decision-making capabilities of the human resources system. The ability to innovate correctly in human resource management can stimulate employee behavior and improve the overall efficiency of the company. On the other hand, the medium of employee knowledge and human resource management, so the level of innovation can reflect the comprehensive level of enterprise operation. The innovative performance of human resource management can limit the development of a company.

## 2. Literature Survey

At this time, the day-to-day operations of the mineral management department requires to develop the reports, maps, official documents, and numerous productions that send and receive transmission, approval, and query statistics. Due to the inefficiency of all aspects of the mining rights, life cycle in data collection, analysis and supervision, real-time monitoring, exploration, mining, management of reserve changes and development, and the use of mining rights are possible in the mineral rights department. There is a critical need to build up a productive mineral asset to the board framework to address the above difficulties [1, 2]. The data analysis was analyzed as a preliminary study, as well as the design of a single enclosure. Use Enterprise Resource Planning (ERP) to protect employees who do their jobs while removing them from the company to decide on their jobs. The results show the need for training and evaluation of later implementation processes and implementations in ERP implementations to solve ERP problems and maintain a good ERP system and find the needs of the enterprise [3, 4].

The definition of human resources policy for industrial enterprises is mainly due to the formation of their business activities since the introduction of the personnel management system adopted by the change management body for the entire commercial area. This model is specifically due to issues related to the construction of this system, and all power checks and balances are defined in the process [5, 6]. With the improvement of present-day data innovation, all life, the executive's models and qualities have been hit by a stroll throughout everyday life. Particularly for current ventures, the utilization of present-day data innovation assumes a significant function in advancing the administration productivity of undertakings that change the customary HR the executive's mode and improving the seriousness of enterprise [7, 8].

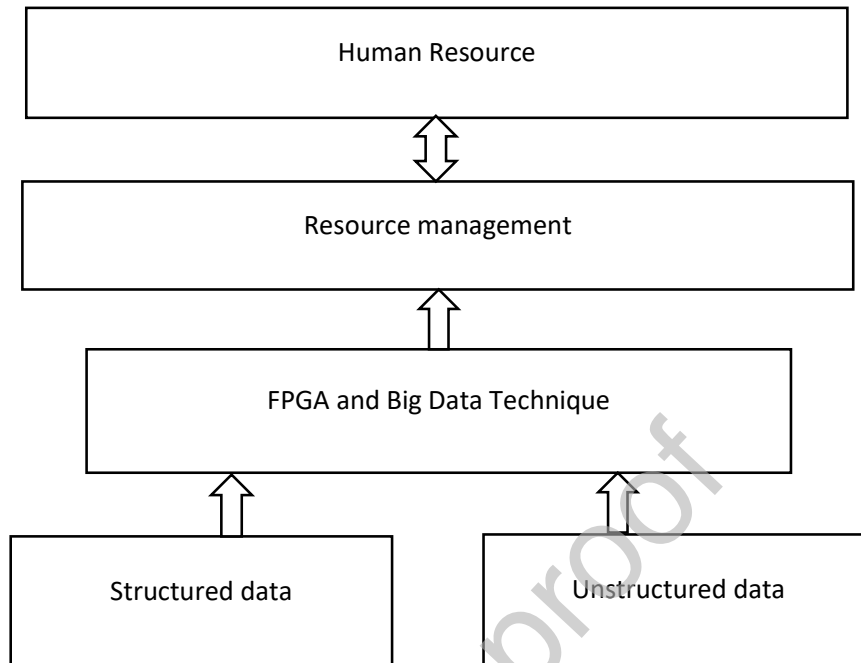
The model then describes how to determine enterprise resource planning bonuses based on key performance indicators within the Human Resources Management module. There are several ways to determine the bonus. It is determined by the length of time an employee works for the company. This does some of the drawbacks of the company and does not make it an efficient person [9, 10]. Electronic human resource management (E-

HR) has always been an essential point of corporate management and competition. Therefore, electronic personnel management systems have received a lot of attention. This article compares the traditional talent management of E-HR with five aspects: role, quality, speed, reliability, flexibility, and cost: human resources management [11, 12].

It is necessary to increase the quality of the employees in the global market to strengthen the company competitiveness. Human resource management based on human capital is at a relatively high level of management, which has many powerful advantages [13]. It uses human capital and other targets human capital to enhance the international competitiveness of the company, increasing the stock of human capital, increasing the value of investing in human capital and efficiency [14, 15]. It occupies the central position of multiple functional management layers of corporate management in human resource management. The way into the ascent and fall of IT organizations is to find, enlist, sustain and secure ability, and how to invigorate the soul of eagerness, development, and a joint effort between representatives [16, 17].

### **3. Materials and Methods**

HR focuses on creating systems, processes, and environments to create employees with better performance satisfaction. In the traditional concept of management, the goal of human resource management is to provide low-wage employees and be more productive. However, with the advancement of knowledge and innovation, traditional talent management models cannot run the competition. As a result, more human resources management has focused on R & D investment and technician interest.



**Figure 1: Proposed Block Diagram**

Therefore, the Human Resource Management Innovation Index can be divided into three parts, represented as employee structure, employee management, and organizational management. All indicators and sub-indexes are listed. Based on HRM, where the index is a good indicator, it is considered a characteristic of more value points and output indicators. To enable information booking of big business human assets, the board choices dependent on enormous information stages. Corporate HR, the executive's choices are made by consolidating the Information Fusion Act and a factual investigation model of corporate HR the board choices. Multi-sample information fusion technology employs scheduling of corporate human resource management decisions, and multidimensional feature mining models of corporate human resource management decisions consist of a combination of method-sampled information. Improve a company's human resource management capabilities to make corporate human resource management decisions and comprehensive scheduling.

### 3.1 Data Collection and Preparation

Data mining is the process of extracting useful knowledge and information from the bases of data, data warehouses, or other information stored in a database, including numerous patterns, associations, and changes in anomalous and significant structures. Relationships with hidden patterns have effectively discovered users to gain more excellent value from data than analysis the system operation. Data mining is used to collect the data and it has features such as association analysis, classification, prediction, outlier analysis, and evolutionary analysis.

### 3.2 Human Resources in Enterprises optimization

Online analysis and processing tools are used to build a tabular model of optimal allocation in the form of corporate talent reports, and statistical regression analysis is the best way to allocate corporate human resources. It is utilized to perform multidimensional data combination and feature extraction. The best assessment formula for halfway likelihood for ideal allotment of HR in an organization is as per the following:

$$p(i, j) = p(i)p(j) = \frac{\frac{\rho}{i} \frac{\rho}{j}}{\sum_{i=0}^n \frac{\rho}{i} \sum_{j=0}^n \frac{\rho}{j}}, i, j = 0, 1, \dots, n \quad \text{---- (1)}$$

In this  $\alpha(i, j)$  represents the transmission state of the optimal HR allocation node of the company in the second state. The competitive model of allocation of optimal human resources for a company is as follows:

$$\alpha(i, j) = \begin{cases} 0, i = 0 \text{ or } j = 0 \\ 1, n - j < i, i \geq j \\ 1, n - i < j, j \geq i \end{cases} \quad \text{---- (2)}$$

The below equation shows the good function of the distribution of multidimensional data of corporate talent.

$$U_v = \beta_v \times \log \left( 1 + \delta_v \times \sum_{j=1}^k s_v e_j \frac{R_c}{n_c} \right), v_i \in v \quad \text{---- (3)}$$

Where,

$n_c = \sum_{j=1}^k s_v e_j$  is a human enterprise fitness function

$U_v$  is the maximum multidimensional data of human resource enterprise utility function.

### 3.3 Adaptive Neural Network Classifier

Input layer, hidden layer and output layer: A neural network is an adaptive neural network (ANNC), which is one of the simplest three-layer feeds. There is one or more processing elements (PES) in each layer. PES are found in simulated neurons in the brain, which is why they are usually called neurons or nodes. The input from any external or previous layer. It has the weights (parameters) associated with them and there are connections between PES in each layer. This weight is adjusted during training. Networks distributed through information-only directions there are no feedback loops there.

Step1: Analysis a set of relevant variables.

Step2: Analysis an ordering for the variables.

Step3: Assume the variables are  $X_1, X_2, \dots, X_n$  (where  $X_1$  is the first, and  $X_i$  is the  $i$ th).

Step4: for  $i = 1$  to  $n$ :

Step5: Adding the  $X_i$  vertex to the network

Step6: Set  $\text{Parent}(X_i)$  to be a minimal subset of  $X_1, \dots, X_{i-1}$ , such that it have conditional independence of  $X_i$  and all other members of  $X_1, \dots, X_{i-1}$  given  $\text{Parents}(X_i)$ .

Step7: Define the probability table of  $P(X_i=k \mid \text{Assignments of Parent}(X_i))$ .

### 3.4 Enterprise Human Resources Decision based on FPGA

Load data into a data warehouse, then cleanly transform scattered data into different enterprise management systems, using talent FPGAs and data mining system extracts, and the equation is shown below

$$p(t+1) = \frac{a_1 p_j(t) + a_2 p_g(t)}{a_1 + a_2} \quad \text{---- (4)}$$

$$x_j(t+1) = p_j(t+1)$$

Where,

$x_j(t)$  is the function rule of human resource

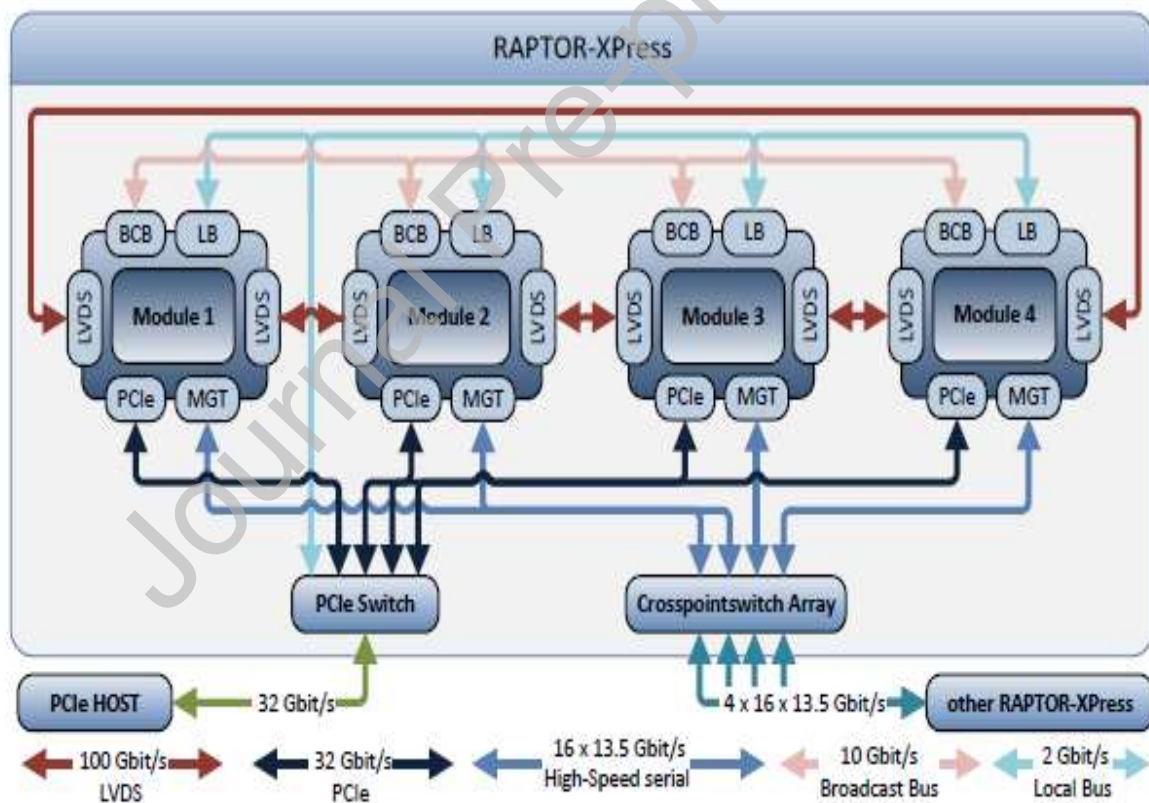
$p_g(t)$  is human resource decision function



According to the above analysis, according to evolutionary stagnation and comprehensive decision-making decisions, general fitness looks like this:

$$f_{avg}(x(t)) = \frac{1}{n} \sum_{j=1}^n f(x_j(t)) \quad \text{---- (5)}$$

As per the above examination, the cross-accumulation strategy finishes the dynamic capacity of the faculty framework to deal with the planning and loading of information and to configure the enterprise talent optimally, and optimal allocation and optimization of the enterprise. One of the fundamental highlights of the framework is the different correspondence foundations that empower the utilization of rapid, low inertness correspondence between FPGA modules between the board and multiple skirting boards. This unique feature allows you to extend your system and create tightly connected FPGA clusters.



**Figure 2: Proposed System Model of FPGA**

The host connection provides eight PCI Express channels. A committed PCI Express switch on the backplane and each FPGA module can get to the full 32-piece data

transmission, thereby allowing fast, low latency, host CPU access to each FPGA in the system.

### **3.4 Reduces human resource management costs**

A corporate atmosphere has been established. In the past, human resource management has emphasized constraints and employee control. They believe that if tasks are not completed by an employee, they require to take action with corporate norms and requirements, ignoring their innovation capabilities and this standardization. Processes can be facilitated, but to some extent, the efficiency of the rigid business processes it brings to the enterprise does not encourage long-term business development. Innovation is difficult to achieve.

Furthermore, with data innovation, workers can prepare full self-governance to accomplish the best staffing. Information technology has completely promoted further corporate development, encouraged innovative employees, and changed the concept of human resource management, and sparked teamwork and communication of conflicting ideas. Information technology brings intimacy between employees, allowing them to communicate and provide feedback in time, fast and easy.

## **4. Results and Discussion**

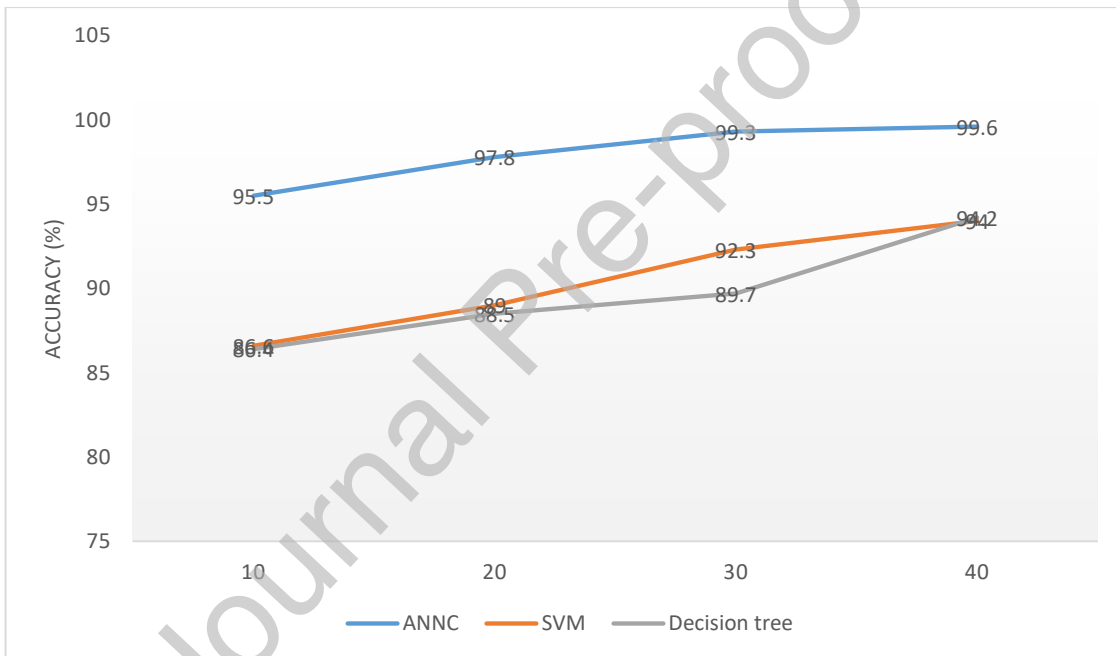
Simulation experimental analysis was performed to test the performance of enterprise human resource management application performance based on FPGA and data mining control in this system. Depending on the settings of the above parameters, and optimal configuration.

**Table 1: Comparison of Accuracy of Human Resources in Enterprises**

*ACCURACY (%)*

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<i>ITERATIONS</i>	<i>ANNC</i>	<i>SVM</i>	<i>Decision tree</i>
<i>10</i>	95.5	86.6	86.4
<i>20</i>	97.8	89	88.5
<i>30</i>	99.3	92.3	89.7
<i>40</i>	99.6	94	94.2



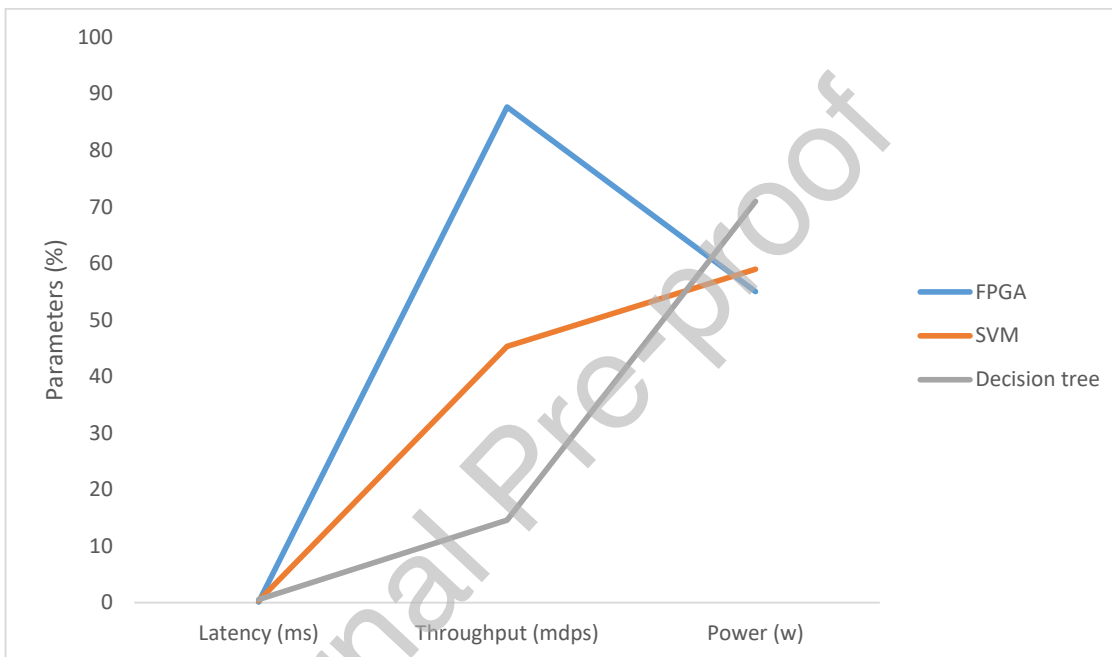
**Figure 3: Accuracy analysis of proposed FPGA model**

Table 1 and Figure 4 give the analysis of proposed system accuracy in optimal enterprise human resources allocation and scheduling is relatively high.

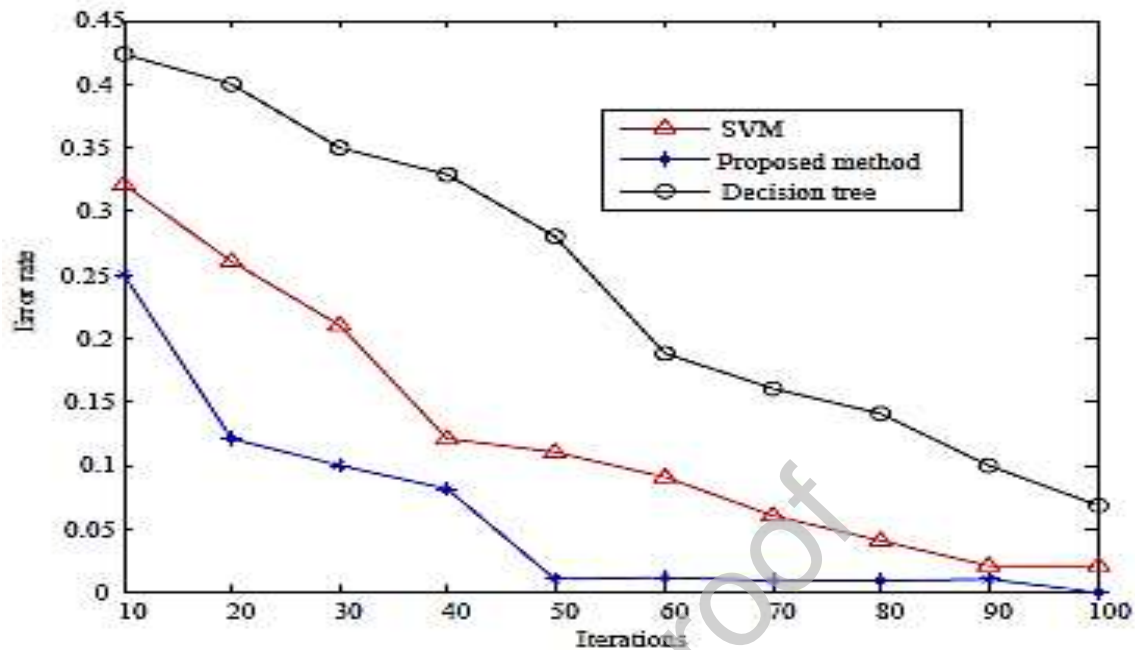
**Table 2: Performance Comparison of Proposed System**

<i>Measurement</i>	<i>FPGA</i>	<i>SVM</i>	<i>Decision tree</i>
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<b>Latency (ms)</b>	0.078	0.31	0.53
<b>Throughput (%)</b>	87.7	45.3	14.6
<b>Power (w)</b>	55	59	71



**Figure 4: Performance Comparison of proposed FPGA model**



**Figure 5: Analysis of Error Rate**

Figure 5 of the proposed FPGA based enterprise talent system provides a reasonable error rate analysis for traditional systems.

## 5. Conclusion

The proposed Neural Network classifier model based on the method, it can make the system operation is simple as possible to get an accurate result. In this system performance analysis is the good management model can be framed by this method. As per the nature of business and management issues, the data available for this type usually determines which data mining techniques are appropriate. If the data belong to a time series, this method is preferred, as described above. Management issues can be categorized into predictions and data, revealing data patterns and insights into specific phenomena. Data similarities and differences are to be identified, FPGAs and data mining control techniques are to be used to resolve these issues. These data can come without any prior knowledge or knowledge attachments in any of the time series data categories or groups of related data records and data records in the form of timestamps.

**Conflict of interest statement**

We declare that we have no conflict of interests.

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## Biography



Ping Liu, female, han nationality, was born in October 1983 in Liaocheng, Shandong Province. She graduated from Shandong Normal University. She obtained bachelor's degree in literature in 2006 and master of Arts in 2009. At present, she is engaged in management in the personnel department of Shandong Vocational and Technical College of labor, with the title of lecturer and research direction of human resource management.

Since taking part in the work, she has presided over one municipal project, participated in five teaching and scientific research projects above the bureau level, presided over one project at the Institute level, independently wrote and published 5 academic papers, served as the deputy editor in chief of 2 teaching materials and participated in the compilation of 2 teaching materials.



Wang Qingqing (female), Han nationality. She graduated from Shandong Jianzhu University in 2007 with a bachelor's degree in advertising, and graduated from Jilin University in 2009 with a master's degree in journalism. From 2009 to 2012, she worked at Shangqiu University as a full-time teacher of journalism. From May 2012 to March 2018, she worked at Shandong Radio and TV Station where she served as a news reporter, an executive editor in charge of column programs, and



an executive editor responsible for government interview programs. Since March 2018, she has been working in Shandong Labor Vocational and Technical College as a lecturer, with research directions in journalism practice, journalism history, and university publicity.



Wentao Liu, male, han nationality, was born in June, 1982, shandong feicheng master graduate student, graduated from fujian normal university. Got bachelor's degree in education, 2006, 2009 master's degree in education in shandong institute of technology of profession of labor organizations united front work department, engaged in the management work, the title as the lecturer, the research direction for the party construction and human resource management.

To participate in internal since joining the work more scientific research topic 3 items, host college topic 1 items, independent writing and 5 academic papers, the second author published 1 papers; One materials.