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Using AI to Handle Human Resources

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ABSTRACT

Staffing remains semi-business or even totally artificial, and the bulk of the labour revolves on the maintenance of reporting, personnel information, and pay due to the relatively low degree of informatization of human resources management. In order to meet the demands of the information era, this study presents artificial intelligence and computer network technology in the form of a human resource management system. These tools allow businesses to better use human resources, enhance the quality of their services, and unleash the passion of their workforce in the service of the company. Enterprises may benefit greatly from this expert information network platform. This article uses the B/S three-layer structure to organise the HRM system's modules and ensure that their respective duties are met. The experimental results of the performance tests demonstrate that the system performs as expected and can accommodate a large number of users at once.

Keywords: - Human Resource Management, Communications Networks, Grading Rubric, and Artificial Intelligence

I. INTRODUCTION

The heart of every successful business is its ability to handle employee data. Manually processing massive amounts of personnel data is not only wasteful, but also adds extra stress and effort for staff. A solid human resource management system must be established to quickly alter the employment situation, boost work efficiency, and boost the fundamental competitiveness of businesses. Human resource management systems that use artificial intelligence have been the subject of much study in recent years, and the results have been promising. For instance, an organization's HR division may have created a human resource management system to oversee all employee data, including but not limited to: demographics, compensation, benefits, hiring practises, performance reviews, career progression, and pay raises. Maintain a database of worker details and manage it. Managers' everyday tasks are simplified by the technology, giving them more time to focus on HR strategy [1-2]. The professional development demands of contemporary businesses cannot be met just by having managers and staff carry out their duties. They start to prioritise their own education and development. The intelligent outcome of the human resource management system, which achieves the genuine zero distance between corporate workers and managers and improves contact [3], is business interaction between employees and executives, made possible by the World Wide Web.

While it's encouraging to see advances in AI-powered HRM systems, there's still a ways to go before every company has really effective HRM in place. This article begins with an explanation of AI technology, moves on to a short description of human resource system design criteria, and then shows how AI technology and computer network technology were used to build a B/S-structured human resource management system and evaluate its efficacy. The objective is to make that the system works as intended and to confirm the viability of the concept.

The rapid pace of all industries in today's dynamic and demanding world is a direct result of technological progress. AI is a technological breakthrough that facilitates rapid enterprise growth and improved productivity. A number of industries, such as accountancy, human resources, advertising, and manufacturing, have adopted this new technology. Through the use of AI, the business has been able to boost its efficiency and effectiveness in everyday operations. Managers at all levels are coming to terms with the need of AI in the workplace in today's competitive and complex business environment. Research was conducted using numerical modelling and data was examined using a regression model. Human resource management (HRM) activities ranging from hiring to assessing

employee performance may all benefit from the use of AI as a platform. In this study, we will examine the different functions of the HR department and the ways in which artificial intelligence (AI) may assist with them. The objective is to learn about things like innovation and the impact of HR initiatives. Human resources departments of several IT companies were analysed. The study's findings showed that AI had a positive effect on a variety of parameters, including ease of use and originality. Read this research piece to learn everything there is to know about artificial intelligence, a sector experiencing a radical technological shift as part of the current iteration of the Fourth Industrial Revolution.

It's no exaggeration to say that artificial intelligence (AI) is a global phenomena at this point in time, having exploded in popularity everywhere from Silicon Valley to the Internet to every country on Earth. The field of Artificial Intelligence (AI) seeks to model and recreate human problem-solving abilities [4]. Artificial intelligence is very important and useful; it use mathematical methods to do work and related tasks that traditionally required human cognitive intelligence. Artificial intelligence (AI) is more narrowly defined as any task that requires the use of cognitive intelligence and reasoning, such as decision making and problem solving. Bellman (1978) The [Kurzweil 1990] Developing and building computers capable of doing work and activities that would normally need innate aptitude and intelligence. Artificial intelligence (AI) is the study of how computers may be used to do tasks normally requiring human intelligence. (Winston, 1992) In other words, it's the study of computer programmes and mathematical formulas that can replace human labour. This is supported by [Knight and Rich, 2003]. AI algorithms may be defined as computer programmes with the ability to mimic human intelligence in terms of their behaviour, perception, and rationality. The conventional wisdom is that AI is only a subfield of Machine Learning (ML). There are many disciplines that rely on it, including mathematics, astronomy, physiology, psychology, morality, organisation, management, and others. Researchers will benefit from being able to combine data from many sources as they work to develop a really intelligent machine [5]. Cognitive capacity, it has been obvious in the previous few generations of AI research, does not merely relate to a user's competency, but also to how well they are mindful of their environment. In order to incorporate information into a computer platform, AI required methods of encapsulation. Some examples of AI methods include: conditional reasoning; production principles; neural networks; semantic networks; and so on. The main purpose of artificial intelligence is to solve problems that are too sophisticated for humans to handle [6].

II. RELATEDWORKS

Data mining, neural networks, information fusion, and similar methods are some of the most popular AI technologies employed today. Synthetic neural networks have many neurons with simple connections and a predetermined structure. It can mimic human thought processes, employ parallel computing capabilities, and sift through big datasets to provide accurate answers for a variety of computing tasks [7]. A perceptron is a linearly-divided binary classification technique that represents a simple model of a neuron. Human resource management (HRM) systems are crucial in the development, allocation, and optimization of an organization's human resources, as well as the enhancement of the managerial quality of those human resources. Human resource system development as a whole, from user-specific needs analysis to HR recordkeeping to budgeting to candidate screening, should begin with a thorough system requirements study. [8].

It was determined through study and deliberation that the personnel management of the system should at least meet the requirements of employee data registration, employee personnel management, Personnel information statistics, and other functions in order to guarantee that the developed HR management system can effectively serve users. The role of registering employees' data is crucial, as it finalises the process of gathering and archiving fundamental data. Employee data may be entered into a dedicated database using a user-friendly interface.

It is necessary to fulfil the employee information maintenance function, which includes updating the data in the information system for the chosen employee and exporting the updated

information to Excel format, in addition to fulfilling the employee information query function. Transferring personnel records is a breeze [9, 10]. Managing employees is an important part of human resource management since it allows us to track essential data including salaries, disciplinary actions, training records, performance reviews, pay raises, and employee moves. The function of personnel information statistics collects and analyses data on all system employees and offers guidance to managers using the statistical segmentation approach. Conditions and output statistics facilitate the derivation of all or a subset of statistics [11].

First, they are quite simple to keep up with, since the hallmark of every top-tier software is its ease of use. Since HR administrators are not often well-versed in computer programming, it is incumbent upon them to do all necessary to ease the burden of system upkeep so that HR managers may get up and running quickly and cheaply [12, 13]. Secondly, it must be scalable and easy to manage. The digital company management components include an HRM system. Multiple integrations with other BMSs are possible. For instance, the HR department has to share employee attendance data with the accounting department during payroll processing, and the HR, engineering, and production planning departments need to work together to assess employee performance. To provide flexible data transfer, offer correct information for diverse departments, and ease employee access [14], the HR information system must be smoothly connected with other management modules. Third, this paper's security architecture for the system accounts for both database and application security [15]. A database backup system, frequent data backups, and secure data storage and printing are all part of database security. In the event of an attack on the system that disrupts the database, these backups may be utilised to restore the database and restore regular service. Database security is ensured when only authorised users have access to the database and when each user is given a unique login and password. And make sure the system app you're using is secure by using the login authentication mechanism. Users may be classified as either system administrators, department administrators, or regular users in the system. Users' true identities are used at registration, and appropriate levels of access are granted based on their roles. In order to get access to the database, each user must first create an account and verify their identity. Only authorised administrators have the ability to backup and restore data from the database.

A nationwide research found that 62% of businesses are interested in using AI to manage administrative and day-to-day work, with just 38% actually doing so. Businesses who have used these technologies have seen an increase in efficiency and creativity in their daily operations. Many authors have studied the area of AI and looked into its applications in many fields. In this study, the authors [16] looked at the impact that AI has on several HRM tasks. The author found that in today's competitive market, a growing number of companies are using AI as a cutting-edge innovation across many areas of human resource management, including recruitment, product quality assessment, and the collection of detailed data on virtualized HR procedures. [17] Researching the impact of robotics and AI on business, he concluded that these technologies might have a negative impact on a variety of functions, including production, productivity management, planning, client management, research and development, and new product development. An analysis verified the connection between AI and its role in the development of HRM [18]. In the HR field, where it is hard to estimate the amount of learning expenditure, the writer's study has focused on identifying the various impediments to AI innovation. He continued, claiming that qualitative data analysis would benefit greatly from using this method. [19] The author's primary interest in doing this study is to learn how AI may aid in the hiring process. The author arrived to the conclusion that AI is crucial in the employment and selecting process. This software allows the company to do things like screen leads, communicate with potential hires automatically, organise team activities, and set up meetings. [20] The title of this study is "Artificial Intelligence and the Changing Nature of Work: The Human-AI Symbiotic Relationship in Business Decision-Making." The study aims to ascertain the benefits that AI may bring to employees in the workplace. As a supporting role, AI helps with making decisions under duress, coping with ambiguity, and coming to consensus. People are

always the most valuable asset in any company, and when it comes to making the unconscious decisions necessary to examine and support conclusion outcomes, innovation is only useful if it is implemented correctly by employees. While artificial intelligence (AI) has been identified as one of the generational intractable difficulties in decision-making, computer intelligence, in the context of informational innovation, will serve as a crossroads for many processes in arriving at decisions during moments of uncertainty. Administration, psychotherapy, computer programming, and many more industries and professions have found uses for AI [21]. The computational model [22], which makes use of the learning technique [23], is the most popular approach in this innovation. There is also a lack of research on HR and its role in many processes, in contrast to the large number of studies conducted in the domain of AI. Analysis conducted in the field of human resources suggests that in the near future, AI will play an increasingly significant role, leading to the widespread automation of HR procedures and a complete overhaul of the HR industry. In this study, we want to learn how AI might be used in several areas of human resources, such as hiring, evaluating employee productivity, and more. The study's initial objectives were to learn about the different ways in which AI is related to human resource management. Second, we need to learn more about the different skill sets involved in human-machine interaction and how they affect creativity and usability.

The newly formed People Capital Management Network has laid up the foundation for the platform's AI capabilities. The Machine Interaction subsystem of AI not only aids in the optimization of the pragmatic approach necessary for a business to obtain, preserve, and verify data, but it also increases the effectiveness of management. Artificial intelligence (AI) systems automate repetitive tasks so humans don't have to [24]. In the realm of human resources, AI is useful for tasks like as resume scanning, message automation, and test comparisons. It was shown that these tools are more effective than the HR division in reducing turnover and boosting morale. It's been shown that AI can do basic HR tasks, but it still has to be tested in more complex settings. Artificial intelligence (AI) implementation is desirable for several reasons, not the least of which is the positive impact it has on an organization's bottom line via both time and effort savings [25].

As HR technology progresses, artificial intelligence is likely to play an increasingly important role in a variety of operational areas, including as recruitment, retention, education, onboarding, and more. Some of the thorny problems and rising demands for HR to accomplish more with less might be solved by cutting-edge AI technologies that digitise and complement the workplace. Over the last several years, there has been a growing focus on human resources informatics. This is because the field has adopted data-driven approaches for the management and analysis of HR data in order to draw useful conclusions. Human resources may benefit from this field of study since it sheds light on the motivations behind employee behaviour and organisational results. The HR industry may benefit greatly from the decision-making and training resources developed in the areas of CI and AI. Unfortunately, there are not enough functioning solutions in this area at the moment.

Artificial intelligence (AI) is a novel method for boosting genetic technologies that can listen, understand, plan, and initiate actions to boost cognitive function and remove barriers to work. [26]. Possible issues with the HR method fall into three broad categories: those involving natural language processing, software robots, and algorithms (thin reliant AI utility companies are perfect for constructing information proof in the HR region such as monitoring content and unfolding pertinent server - side troubles [27]). Voice-to-text transcription Data is disseminated using this technical programme, which translates material into local languages, visuals, and search engines. Computer programmes called "bots" scour various kinds of search results for a target term. This method excels in facilitating broader talks, verbal communication, talking, directing, recommending, and other related tasks. In order to tackle complex problems, the current AI technologies need to be refined in a number of ways. There are too many ifs, ands, and buts even for the simplest of judgements and concerns. The AI methodology consists of rules and guidelines that must be followed in order to successfully direct AI

processes. Human resources tasks like as data feed acquisition, customer communication, KPI analysis, and social network activity monitoring are simplified by technological advancements.

Why AI is so important in human resources?

Human resources directors face a formidable challenge when trying to fill open positions: sifting through a sea of resumes to find the greatest possible fit. Robotics recruitment software might research and evaluate candidates, eliminating those who aren't a suitable match for the role. An artificial intelligence (AI) evaluation and hiring system will determine the best candidate for the open post. In the economic world, original thinkers are invaluable. For AI to succeed, it needs a system for making recommendations on leisure activities and professional development that are tailored to the individual's specific interests and skill set. Microlearning programmes are those that are continually scanning educational information and creating connected ones. Many other types of self-learning algorithms, such as those used for deciphering previously-published code, may be found in AI software. Discrimination in the workplace reduces the success of the company in enhancing the evaluation of individual productivity. Prejudice towards some groups may be mitigated or even eradicated by AIs with enough user input. Tools driven by AI can monitor the goal of constant monitoring and teamwork in the workplace. Artificial intelligence (AI) is utilised to improve internal processes and to guide staff. The hardest part of human resources is undoubtedly recruiting top talent, but retaining top performers may be just as difficult. For 57% of businesses, the task of exempting people is the most difficult and crucial. The use of AI may overcome this obstacle by allowing for the accurate forecasting of the needs and actions of specific workers. Human resources managers may now proactively prevent incidents by using this solution .

III. PROPOSED SYSTEM ARCHITECTURE

Each client in the corporate network establishes a wired or wireless connection to the network, and the application server stores the acquired data in a database. Also linked to the network through wired or wireless connections, the management terminal accesses the application server to execute routine maintenance tasks including browsing and erasing client-collected data. This new system uses a B/S three-tier architecture and AI technologies for its development. The levels of a three-tier architecture have clear responsibilities and operate autonomously from one another. Human resource management systems benefit from this kind of architecture because it allows for higher levels of cooperation and coordination, which ultimately leads to greater productivity.

The HRM system's energy components are broken down into their individual parts in Figure 1. We'll describe each module's primary purpose in turn.

Component for managing personnel records:

Its primary uses include HR setup and initial configuration, data querying and maintenance, and personnel reporting and recruiting management.

Component for Managing Insurance Details:

This module may be used to handle all insurance data pertaining to employees. Managers may log in and track down insurance details for their staff by serial number, name, insurance type, and payment date. A table list displays the results of any queries performed on the database, and all modules support adding, removing, and changing records. Too many entries for a single page causes the system to generate new pages.

Contract Setting component:

This module may be used to keep track of all company and employee contracts.

Attendance Setting Component:

It is the primary function of the attendance management module to oversee time-keeping and overtime policies within an organisation. The administrator may store and query the data from each component of this module by using the add, delete, edit, and query functions. Attendance policies are initially established by human resource managers.

Overtime requests from staff may be submitted using this section and approved by HR administrators. Each day, the system records attendance, and at the end of the month, the HR manager compiles that data with other attendance

records to create a monthly attendance report (overtime, leave, etc.). This information is used to submit persons and departments for verification of the monthly reward or punishment, as per the predetermined reward and punishment measures, inside the financial management subsystem.

Curriculum Administration Software:

On-the-job training, safety training, management training, occupational skill training, and other forms of training are all subcategories of education and training management. This section may keep track of each worker's training history in a certain category. Managers may document training details such as items, kinds, sponsors, content, hours, locations, start/end times, outcomes, certifiers, opinions, consolidated opinions, comments, and more.

Managing Employee Health in the Workplace:

Distribution of labour protection supplies, employee medical exams, occupational illnesses, work-related injuries, and workers in unique circumstances are all managed via this section of the software. Health management data may be entered by human resource managers. Employees in the Material Department have access to data on workers' compensation claims, while those in the Finance Department have access to data on workplace safety.

The system's criterion management subsystem:

The key features of this module are the creation, modification, querying, and erasing of dictionaries for physical examinations, education, employment positions, labour insurance supplies, insurance categories, and job types, with the user base being HR management professionals.

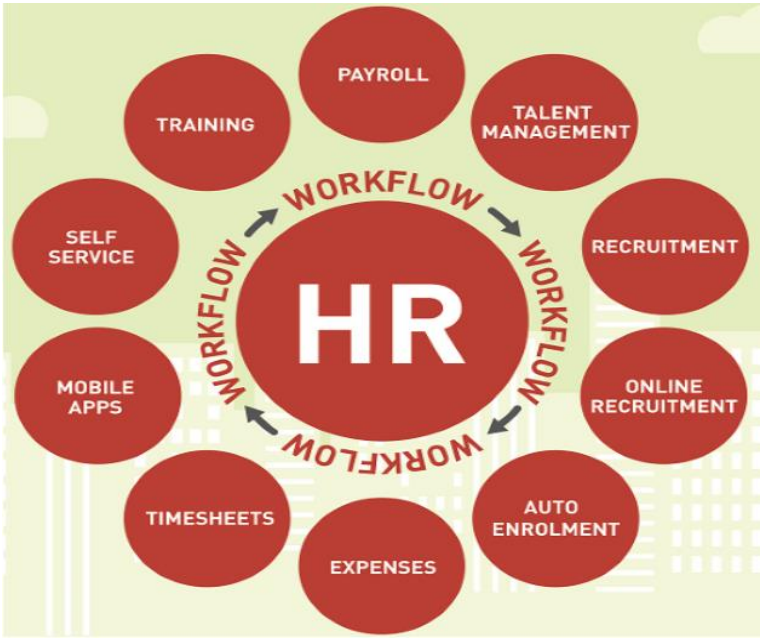

Fig.1 Components of an HR management system's active constituents

IV. RESULTS AND DISCUSSION

The human resource management system proposed in this study requires performance testing to ascertain that it operates normally and that its features are suitable for their intended purpose. This article thus evaluates the system's ideological performance in terms of scalability, security, concurrency, operability, etc. If the result of the performance test is higher than the theoretical value calculated during the system's design, then the system's performance is satisfactory. From what has been said, you can deduce that scalability refers to the ease with which new data and information can be shared among the various functional modules of the system; security refers to the necessity of user login names and passwords, and the system can regularly back up data; concurrency refers to the system's ability to accommodate multiple users logging in and using it simultaneously; and operability refers to the ease with which even inexperienced users can learn to use it. Figure 2 presents the outcomes of the performance tests. Results for scalability, security, concurrency, and operability in the theoretical context are 85%, 94%, 96%,

and 98%, whereas values from the tests are 94%, 100%, 100%, and 100%, respectively. The system's performance is satisfactory since the observed value from testing is higher than the expected theoretical value.

The extent to which testing for concurrency accurately reflects actual concurrency relies on factors like the number of users, the efficiency of connections, etc. The ultimate goal is to get access to the system in order to collect relevant performance metrics for the aim of conducting a thorough evaluation of the system's effectiveness. The procedures for the tests are as follows: play out a fictitious user's log-in sequence. There are 50 initial samples used to determine the total number of users, and each subsequent set of 50 users is tested once. Someone will enter data every 10 seconds. As soon as the request is sent to the server, the evaluation will start. respond. This is done so that the tester may compile data on the server system's response time, delay time, and load generator count. Table I displays the findings. Based on the numbers presented, with 50 people online at once, the response time is 0.26 seconds, the delay time is 0.02 seconds, and a single load generator is sufficient to meet demand. With 300 users, the response time is 1.01 seconds, the delay time is 0.35 seconds, and 2 load generators are required to be activated. Response time, delay time, and the number of load generators all increase as the number of users rises, but the increases are manageable and the system can still handle many users at once.

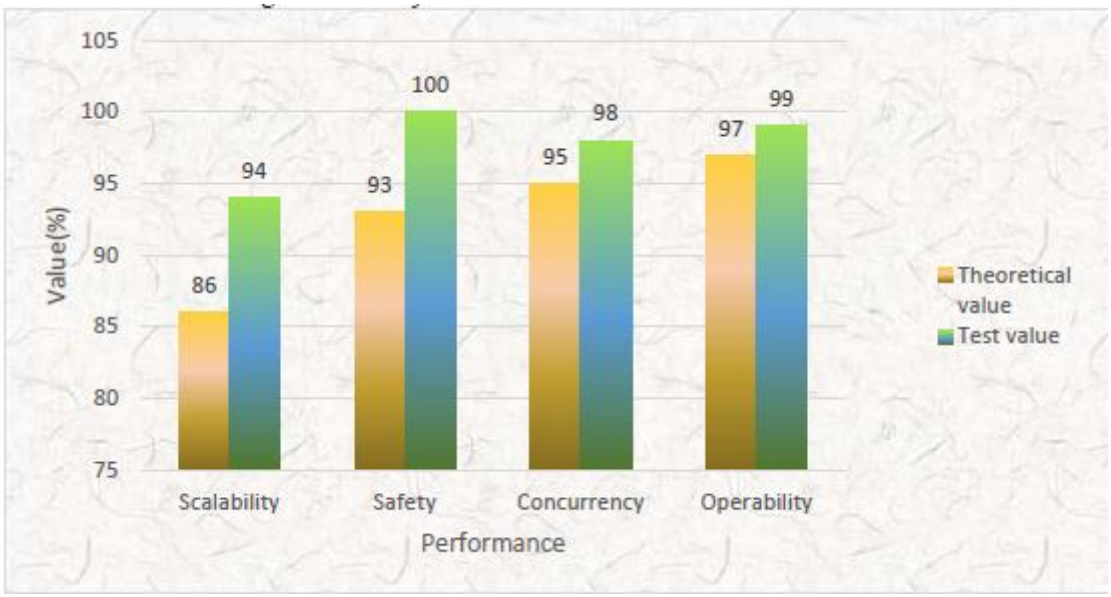

Fig.2 Analyses of Productivity

TABLE I Reaction DATA FROM THE Computer

	Response time(s)	Delay(s)	Number of load generators
50	0.26	0.02	1
100	0.41	0.07	1
150	0.57	0.1	1
200	0.72	0.18	1
250	0.83	0.24	2
300	1.01	0.35	2

V. FUTURE SCOPE AND CONCLUSION

This study creates a multi-functional module HRM system based on AI technology that can handle insurance, contracts, salaries, and the distribution of administrative burdens among personnel managers. After the system has been constructed, it must be put through its paces to see whether it can be used as a gauge of the development's success. As a result, four performance tests were conducted on the system, and experimental study of the system's concurrent use was conducted. The results demonstrate that the system can be used in real-world human management.

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