THE IMPACT OF THE AI ERA ON HUMAN RESOURCE MANAGEMENT IN SMALL AND MEDIUM – SIZED ENTERPRISES

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This study analyzes the impact of the Artificial Intelligence (AI) era on human resource management within Small and Medium-sized Enterprises (SMEs) in Vietnam. Through a survey of 477 respondents, comprising both management and staff, and utilizing data analysis with SPSS software, the study assesses the significant role of AI in enhancing recruitment efficiency, performance evaluation, task allocation, and human resource development. The findings indicate that AI contributes to time savings, enhanced objectivity, and the automation of numerous HR processes, particularly within the recruitment and selection phase and in the development of management systems.

However, the adoption of AI also presents challenges, such as high initial investment costs, data security concerns, and the need to adapt to technological changes and shifts in the labor structure. The human role in supervision and control remains essential to ensure long-term flexibility and effectiveness. This study provides empirical evidence to assist SMEs in identifying priorities for AI investment, while also proposing strategic directions for enhancing technological capabilities and refining an effective human resource management system for the digital era.

Keywords: Human Resource Management (HRM), Small and Medium-sized Enterprises (SMEs), Talent Selection and Utilization, Performance Evaluation, Artificial Intelligence (AI).

1. Introduction

Artificial Intelligence (AI) is increasingly becoming a critical tool across numerous fields, particularly in human resource management. For Small and Medium-sized Enterprises (SMEs), attracting and retaining talent amidst today's fierce competition makes human resource management an essential factor for ensuring stable and sustainable development. Effective HRM not only helps an enterprise allocate its labor resources rationally but also contributes to enhancing the efficiency of its production and business operations.

Unlike large corporations with professional and large-scale HR departments, SMEs often face limitations in resources and administrative personnel. In this context, the application of AI in human resource management not only helps to simplify processes such as recruitment, evaluation and training, but also contributes to minimizing errors and saving operational time and costs. Concurrently, AI supports businesses in analyzing HR data quickly and accurately, facilitating informed strategic decisions, which in turn improves the employee experience and enhances talent retention.

Nevertheless, the adoption of AI in HRM within SMEs also poses considerable challenges. Financial barriers, access to technology and the availability of specialized HR skills are common obstacles. Furthermore, employee acceptance and adaptation to automated systems significantly influence implementation effectiveness. Additionally, issues related to information security and initial investment costs cannot be overlooked. Therefore, enterprises must develop appropriate strategies to harmonize technology with the human element, aiming for a holistic and sustainable development of their human resources.

This study focuses on analyzing both the positive impacts and the challenges that the AI era presents to human resource management in Small and Medium-sized Enterprises. Its objective is to propose suitable strategies to help these businesses maximize the benefits derived from AI while maintaining the central role of people in their development process.

2.Theoretical Framework and Research Methodology

2.1. Theoretical Framework

Human Resource Management (HRM) is a field focused on managing and maximizing the potential

of an organization's workforce. This function encompasses numerous aspects such as recruitment, training, evaluation and the management of people-related issues to establish a solid foundation for achieving strategic objectives and long-term development. Furthermore, HRM plays a crucial role in fostering a positive work environment, thereby building employee engagement and commitment to the enterprise.

Within a traditional framework, the human resource management system typically relies on a clear hierarchical division of roles and responsibilities. This structure facilitates management and task coordination across departments while ensuring operational stability when facing external fluctuations. Reward and promotion mechanisms are based on actual performance and length of service, which encourages long-term employee motivation.

However, the traditional management model also presents several limitations, notably repetitive procedures that are time-consuming and prone to error, a lack of flexibility in responding to the rapid changes of the modern labor market and difficulties in attracting and retaining high-quality talent. These challenges are particularly pronounced for Small and Medium-sized Enterprises (SMEs), which often operate with limited financial and professional resources.

The emergence and advancement of Artificial Intelligence (AI) represent a new frontier in human resource management. With its ability to automate processes such as screening candidate profiles, designing personalized skill development programs for individuals and continuously monitoring and evaluating work progress, AI empowers management to make data-driven decisions with greater accuracy. This technology also helps refine operational systems by optimizing organizational structures and internal processes, thereby enhancing overall efficiency.

Specifically, the application of AI in recruitment helps automate the analysis and filtering of resumes based on predefined criteria, while also incorporating assessments of non-verbal cues such as facial expressions, tone of voice and a candidate's demeanor during interviews. AI is also utilized in designing tests and tracking progress during training to help managers adjust competency development programs accordingly.

Simultaneously, AI enables the consolidation and analysis of data from various sources related to employees' work history, attitudes and turnover trends. This provides managers with objective information to make effective decisions, reducing reliance on subjective perception. Consequently, productivity assessments become more transparent and equitable.

On another front, AI also supports the creation of a clear organizational structure, detailing the functions and responsibilities of each department and job position. This helps enterprises, particularly SMEs, to more conveniently manage human resource information, promote effective coordination and ensure the transparency of internal processes.

In summary, AI is not merely a tool for enhancing human resource management practices but also opens up numerous opportunities for innovation, alongside the inherent challenges of technology application and managing limited resources within SMEs. A thorough investigation of the impacts of AI in the field of HRM for this group of enterprises plays a pivotal role in proposing appropriate solutions, moving towards sustainable and comprehensive development.

2.2. Research overview

In the current digital economy, the application of Artificial Intelligence (AI) in the human resource management of Small and Medium-sized Enterprises (SMEs) has become a topic of widespread interest in international research. The majority of recent studies have focused on analyzing the role of AI in modernizing HR functions, with an emphasis on recruitment, resource development and operational optimization.

Several key studies have documented the significant contributions of AI in this field. For instance, the comprehensive review "Benefits and Risks of Using AI in Human Resource Management" (2025) analyzed 67 scientific articles and pointed out that while AI acts as a catalyst for the digital transformation of activities such as recruitment, training, and performance evaluation, it also poses risks: algorithmic bias, lack of transparency, internal resistance and digital skill gaps within the organization.

Adopting a practical approach to SMEs, the study "Incorporating Artificial Intelligence in Human Resources Management in Small and Medium Companies" (2024) surveyed the application of AI in the personnel selection process. It found that AI helps streamline and improve recruitment accuracy, while also identifying major barriers related to technological resources and the challenge of innovating corporate culture during the digital transformation.

Furthermore, the systematic review "Unveiling the Potential of Artificial Intelligence in Human Resource Management: A Systematic Review" (2025) evaluated various existing research streams on AI application in HRM. It particularly highlighted factors related to implementation strategy, organizational conditions and practical difficulties such as the lack of necessary skills or technological obstacles, while recommending future research directions tailored to the specific characteristics of SMEs.

Additionally, the study "Strategic Innovation in HRIS and AI for Enhancing Workforce Productivity in SMEs: A Systematic Review" (2024), based on an analysis of 100 works, emphasized the effectiveness of combining Human Resource Information Systems (HRIS) with AI to increase labor productivity, improve decision-making, and innovate HR policies. It also pointed out notable barriers concerning investment costs, a shortage of IT personnel and challenges in integrating new technology platforms.

A different perspective was presented in "Artificial Intelligence-Driven HR Practices in SMEs: A Prisma-Compliant Scoping Literature Review" (2023), which highlighted the gap in assessing the direct impact of AI on fundamental processes in SMEs, most notably in recruitment, skills assessment, reducing bias and shortening task processing times.

Recent studies have concentrated on clarifying the critical role and practical applications of Artificial Intelligence (AI) in human resource management, especially within SMEs. Some works analyze how AI enhances efficiency in HR functions such as managing employee records, processing payroll, recruitment, performance evaluation, and the employee onboarding process. AI has been identified as having six primary roles: optimizing recruitment and selection, supporting onboarding, promoting learning and development, enhancing performance management and improving employee engagement and retention.

Furthermore, many other studies focus on how AI comprehensively improves HR functions by optimizing the selection process and assisting businesses in implementing effective technological solutions. AI not only contributes to attracting and recruiting talent but also helps shape recruitment strategies, enhance the employee experience, and develop leadership capabilities within the organization.

Several works emphasize AI's role in increasing productivity and reducing operational costs in businesses, while also affirming that AI serves as a tool to support humans, not to replace the central role of personnel in decision-making and comprehensive management.

Specifically, research in the Vietnamese market has clarified that AI expands opportunities for employees to proactively acquire knowledge, while also helping organizations manage and train their workforce more scientifically and effectively. The main impacts of AI include optimizing the recruitment process; forecasting personnel needs and analyzing job performance; detecting and resolving HR-related issues; and assessing potential and planning future employee development paths.

However, there is a current lack of in-depth research aimed at building strategies for integrating AI into the practical HR functions of SMEs, distinguishing this from research on large corporations or generalized models. The following gaps are noted:

The impacts of AI on the experience, work motivation and long-term engagement of employees in small-scale enterprises have not yet been fully studied.

The development and evaluation of "tailor-made" AI solutions for the specific characteristics of SMEs remain limited in both theory and practice, particularly concerning implementation costs, ease of application and the effectiveness of training and change management.

There is still a lack of empirical data and in-depth analysis regarding barriers to digital transformation, as well as the flexible coordination mechanisms between AI innovation and organizational-cultural factors within SMEs.

Current research findings consistently affirm the vast potential of AI in improving human resource management and enhancing the operational efficiency of SMEs. However, in practice, many issues regarding implementation models, optimal integration solutions and the specific organizational conditions and cultural structures remain unclarified, necessitating further research to increase the applicability of these technologies for this group of enterprises in the future.

2.3. Research Methodology and Model

2.3.1. Research Design

This study employs a mixed-methods approach, combining both qualitative and quantitative research to provide a comprehensive perspective on the impact of the Artificial Intelligence (AI) era on human resource management in Small and Medium-sized Enterprises (SMEs). The qualitative method facilitates an in-depth exploration of specialized literature, reports and related studies, while the quantitative method relies on field surveys conducted at enterprises to gather data on AI application.

2.3.2. Research Subjects

The primary subjects include management leaders and employees directly involved in human resource management activities within SMEs. Additionally, the study extends to specialized managers from relevant functional departments.

2.3.3. Data Collection Instruments

Survey: A questionnaire was designed to record participants' assessments of the extent of AI's influence on recruitment processes, performance evaluation, personnel development and overall management.

In-depth Interviews: Detailed discussions with leaders and managers provided authentic qualitative

information regarding the advantages, limitations and challenges encountered when applying AI in human resource management.

2.3.4. Data Analysis

Qualitative Analysis: Content analysis of the interviews was conducted through data coding to identify key themes, as well as the advantages and difficulties of applying AI in human resource management.

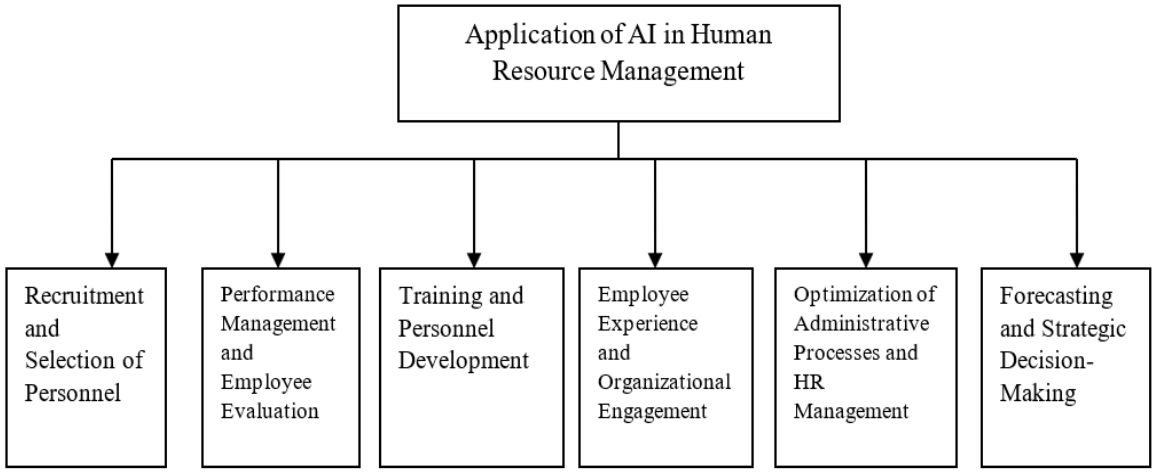
Quantitative Analysis: Survey data was processed using statistical software (e.g., SPSS). Descriptive statistics were used to summarize baseline data and regression analysis was employed to clarify the correlation between the level of AI application and specific factors in human resource management.

In the analytical model, the dependent variable is the level of AI application in human resource management, while the five independent variables include: AI in talent recruitment and selection; AI in performance evaluation and personnel development; AI in employee management and corporate culture building; AI in work efficiency assessment and AI in building the HR management system. Prior to running the regression model, all variables were standardized to ensure the comparability and accuracy of the results.

2.3.5. Summary of Research Methodology

The study successfully combines theoretical exploration with empirical surveys conducted at enterprises. A total of 191 valid survey responses were collected from 200 leaders and 286 valid responses from 300 employees at SMEs, resulting in a total of 477 responses eligible for analysis. This dataset has systematically supported a comprehensive assessment of AI's impact on each human resource management process, while also yielding practical conclusions relevant to the current context.

Figure 1: The Impact of AI on Factors in Human Resource Management



3.Research Results

3.1 Descriptive statistics

Through a survey of opinions from leaders of organizations, businesses and employees, the study shows that the application of artificial intelligence (AI) in the recruitment and talent selection process brings about clear positive impacts.

Table 1. Statistical results on AI application in recruitment and talent selection

Variable	Number of valid observations (N)	Missing	Mean	Standard Deviation	Minimum value	Maximum value
A01	199	1	4.27	0.707	3.00	5.00
A02	199	1	4.23	0.741	3.00	5.00
A03	199	1	4.24	0.705	3.00	5.00
A04	199	1	4.27	0.736	2.00	5.00

A05	199	1	4.25	0.742	3.00	5.00
A06	198	2	4.21	0.744	3.00	5.00
A07	199	1	4.27	0.736	3.00	5.00
A08	198	2	4.33	0.734	1.00	5.00
A09	198	2	4.30	0.674	3.00	5.00
A10	199	1	4.23	0.706	2.00	5.00
A11	299	1	4.05	0.968	1.00	5.00
A12	299	1	3.99	0.986	1.00	5.00
A13	299	1	3.99	0.981	2.00	5.00
A14	298	2	3.98	0.983	2.00	5.00
A15	298	2	3.92	0.977	1.00	5.00
A16	299	1	3.90	0.947	2.00	5.00
A17	298	2	3.97	0.944	2.00	5.00
A18	299	1	3.88	0.967	1.00	5.00

The results show that leaders rate the efficiency and speed of AI application in recruitment highly, with mean scores ranging from 4.21 to 4.33, as reflected in variables such as A02 and A06. Employees also expressed positive perceptions, with mean scores from 3.97 to 4.05 (A11, A12). AI is recognized for making the recruitment process more transparent and objective, contributing to the minimization of bias in candidate selection (reflected in A03, A05). Furthermore, AI assists in forecasting future recruitment trends, evidenced by a high mean score (A07, 4.27), enabling enterprises to formulate more precise workforce planning.

However, the survey also indicates that AI carries a potential risk of error if the input data is not accurate and up-to-date (A08, with a minimum value of 1.00). Employee concerns regarding personal data security in the context of AI adoption are also evident, with a mean score of 3.92 (A15). Notably, approximately 47% of employees expressed opposition to the complete replacement of humans by AI in the evaluation of soft skills, asserting that AI should only serve a supportive function rather than acting as a substitute for human decision-making (A18, mean score 3.88).

From this analysis, it is evident that AI is generating a significant positive impact on talent recruitment and selection within SMEs. Concurrently, it raises concerns regarding the handling of input data and the safeguarding of employee privacy rights. Furthermore, the irreplaceable role of human judgment in decisions related to soft skills is reaffirmed, maintaining its central position in the modern human resource management system.

Table 2. Statistical Results on Performance Evaluation and Personnel Development

Variable	Number of valid observations (Valid)	Missing	Mean	Standard Deviation	Minimum value	Maximum value
B01	199	1	4.24	0.712	3.00	5.00
B02	199	1	4.27	0.748	1.00	5.00
B03	199	1	4.10	0.711	3.00	5.00
B04	199	2	4.25	0.731	2.00	5.00
B05	199	1	4.18	0.741	1.00	5.00
B06	199	1	4.29	0.713	3.00	5.00
B11	299	1	4,037	0.949	2.00	5.00
B12	298	2	4.013	0.917	2.00	5.00
B13	298	2	4,084	0.952	1.00	5.00
B14	298	2	4.101	0.934	2.00	5.00

B15	299	1	3,977	0.960	1.00	5.00
B16	299	1	4,017	0.991	2.00	5.00

Analysis of the collected data indicates that AI is highly regarded for its ability to support objective and accurate performance evaluation, with mean scores ranging from 4.24 to 4.27 (variables B01 and B02). This technology contributes to the processing and analysis of performance-related data, helping to identify trends in employee attitudes and productivity, as well as in the application of compensation and benefits policies, as reflected by mean scores from 4.04 to 4.10 (variables B11 and B14).

Notably, AI also supports the automation of the performance review process and recommends individual development plans for employees, with a mean score of 4.10 (B03). Furthermore, AI assists in designing training programs tailored to the actual needs of each individual based on evaluation results, as demonstrated by a mean value of 4.08 (B13). This shows that the technology not only enhances evaluation efficiency but also contributes to promoting human resource development in a systematic and scientific manner.

However, the results also reveal that employees have concerns about the possibility of AI completely replacing the human role in evaluation, with a mean score reaching 4.25 (B04). Concurrently, many employees expressed a desire to maintain human control and supervision in this process to ensure fairness and transparency, as indicated by a mean value of 3.98 (B15).

A point of consideration is that the investment and operational costs of AI systems are considered a significant obstacle for small and medium-sized enterprises due to their limited financial resources. This is a critical factor that requires careful consideration to ensure the effectiveness and sustainability of technology adoption.

In conclusion, AI is playing a positive role in enhancing the quality of evaluation and personnel development at SMEs. However, it also presents challenges regarding the balance between technology and the human element, as well as concerns related to costs and employee acceptance.

Table 3. Statistical Results of AI in Employee Management and Corporate Culture Building

Variable	Number of valid observations (Valid)	Missing	Mean	Standard Deviation	Minimum value	Maximum value
C01	***199***	***1***	***4.22***	***0.764***	***1***	***5***
C02	***199***	***1***	***4.32***	***0.714***	***3***	***5***
C03	***198***	***2***	***4.28***	***0.72***	***2***	***5***
C04	***198***	***2***	***4.12***	***0.778***	***1***	***5***
C05	***199***	***1***	***4.28***	***0.746***	***2***	***5***
C06	***199***	***1***	***4.27***	***0.748***	***1***	***5***
C11	***298***	***2***	***4.06***	***0.946***	***1***	***5***
C12	***299***	***1***	***4.05***	***0.926***	***2***	***5***
C13	***298***	***2***	***3.94***	***0.974***	***1***	***5***
C14	***299***	***1***	***3.96***	***0.963***	***1***	***5***
C15	***298***	***2***	***3.99***	***0.99***	***2***	***5***
C16	***299***	***1***	***4.02***	***0.946***	***1***	***5***

Analysis of the survey data reveals that AI is making a positive contribution to the automation of employee management processes, with mean scores ranging from 4.22 to 4.32 (variables C01, C02, C05), thereby enhancing operational efficiency within Small and Medium-sized Enterprises. This technology supports the assessment of employee satisfaction levels (Mean approx. 4.13) and analyzes feedback to improve the work environment, thereby increasing employee satisfaction and engagement (C04).

Furthermore, AI contributes to enhancing the efficiency of human resource management (e.g., C06 with a mean score of 4.27) while also reducing the perceived workload among employees (C12 with a Mean of 4.05). The responses also indicate that

AI helps to create greater fairness in the evaluation and HR management processes (C03 with a score of 4.28).

However, the survey results also highlight the inherent limitations in the application of AI. Specifically, AI cannot yet fully replace the human leadership role, as its capacity for deep human understanding and its ability to foster a culture of innovation remain limited (C04 and C14 had mean scores of 4.12 and 3.96, respectively). Additionally, employees expressed concerns about the security of their personal data as AI becomes more widely used in management (this is a point that enterprises need to prioritize and improve).

Thus, in the current context, AI serves as a powerful support tool for employee management and organizational culture development in SMEs, but it must be integrated with the human element to ensure comprehensive effectiveness and a humanistic approach in human resource management.

Table 4. Statistical Results of AI in Work Efficiency Assessment

Variable	Number of valid observations (Valid)	Missing	Mean	Standard Deviation	Minimum value	Maximum value
D01	199	1	4.18	0.68	1	5
D02	198	2	4.13	0.769	2	5
D03	199	1	4.22	0.724	3	5
D04	199	1	4.23	0.763	1	5
D05	199	1	4.14	0.938	1	5
D06	198	2	4.31	0.819	2	5
D11	298	2	4.04	0.947	2	5
D12	298	2	4.01	0.976	2	5
D13	298	2	3.99	0.943	2	5
D14	298	2	3.97	0.939	2	5
D15	298	2	4.01	0.95	1	5
D16	298	2	4.04	0.944	1	5

The figures reflect positive assessments of AI's capability in analyzing and processing data related to work efficiency, with mean scores ranging from 4.13 to 4.18 (D01, D02). AI is recognized for effectively supporting the organizational decision-making process, achieving a mean score of 4.23 (D04). Furthermore, this technology assists in forecasting potential risks and providing suitable recommendations for mitigation, with a mean score of 4.14 (D05).

Employee feedback also expresses confidence in AI's ability to enhance fairness in work evaluation, with mean values ranging from 4.01 to 4.04 (D11, D12). Moreover, AI is considered a useful tool for identifying skills that require improvement, although the recorded mean score of 3.99 (D13) indicates that there remains potential for further refinement in this regard.

Overall, the results indicate that AI is making a significant contribution to optimizing work efficiency evaluation processes, enhancing accuracy and fairness in human resource management within SMEs. At the same time, remaining concerns, such as the effectiveness of identifying latent skills, suggest that enterprises need to continue investing in and refining the application of this technology to achieve optimal outcomes.

Within the process of human resource management, AI plays a positive role in supporting rational and effective task allocation, with mean scores indicating a high degree of consensus, ranging from 4.18 to 4.31 (variables E03, E04, E11, E15). This technology also assists in establishing accurate and scientific Key Performance Indicators (KPIs), achieving a mean score of 4.02 (E12).

However, alongside the clear benefits, the application of AI also faces considerable challenges. Technology investment costs are often quite high, causing difficulties for SMEs in adoption and implementation. Furthermore, adapting to abrupt changes in the business environment is another significant issue to be addressed. Additionally, updating job descriptions and precisely identifying the specific skills required for each position remain weaknesses, as reflected by the mean score of 3.99 (E16).

In general, AI is evaluated as a powerful tool in human resource management, helping

to increase objectivity, automate processes and promote enhanced labor productivity. However, to maximize its potential, the close integration of AI technology with human supervision and evaluation is indispensable. This helps to overcome limitations related to emotional elements and information security, as well as to ensure flexibility in the practical work environment, thereby delivering comprehensive and sustainable management effectiveness for the enterprise.

3.2. Regression analysis

Table 5. Regression analysis results

Parameter	Value	Meaning
Number of observations (N)	477	Number of valid survey forms used for regression analysis
R squared (R^2)	0.672	67.2% of the variation in the dependent variable is explained by the model.
Adjusted R squared	0.665	Adjusted for the number of independent variables, the model fit was good.
Estimated standard error (Std. Error)	0.381	Standard deviation of residuals, forecasting model is quite close to reality
F (ANOVA test)	93.47	Large F value, testing overall significance of regression model
Sig. (p-value)	0.000	< 0.05, the model is statistically significant
Independent variable	**Standardized coefficient (Beta)**	**Sig. (p-value)**
AI in Recruitment & Talent Selection	0.312	0.000
AI in Performance Assessment & Development	0.258	0.000
AI in employee management & corporate culture	0.194	0.002
Performance appraisal	0.182	0.005
Building a human resource management system	0.137	0.018

A multiple regression model was constructed based on 477 valid survey responses to assess the impact of various Artificial Intelligence (AI) application factors on the effectiveness of human resource management in Small and Medium-sized Enterprises (SMEs). The statistical results indicate that the model is highly reliable, with an Adjusted R-squared (Adjusted R^2) of 0.665. This means that 66.5% of the variance in the dependent variable is explained by the independent variables included in the study.

The overall model significance test (F-test) yielded an F-value of 93.47 with a significance level of $p = 0.000$, confirming the model's suitability for explaining the simultaneous impact of the AI factors on human resource management. The standard error of the estimate was 0.381, suggesting that the model's predictions align closely with the actual survey data.

Regarding the individual impact of each factor, as measured by the standardized beta coefficients, the variable "AI in talent recruitment and selection" had the strongest influence, with a beta coefficient (β) of 0.312 ($p = 0.000$). This indicates that the application of AI in the initial human resource input stage plays a crucial role in enhancing HRM effectiveness.

Following this, the variable "AI in performance evaluation and personnel development" had a beta coefficient (β) of 0.258 ($p = 0.000$), reflecting the positive contribution of AI in analyzing, evaluating, and promoting the development of internal resources.

The factors "AI in employee management and corporate culture building" ($\beta = 0.194$; $p = 0.002$), "Work efficiency assessment" ($\beta = 0.182$; $p = 0.005$), and "Building the HR management system" ($\beta = 0.137$; $p = 0.018$) also had a significant influence,

albeit to a lesser extent and all were statistically significant.

Aggregating these coefficients reveals a clear order of priority for AI implementation: activities related to AI-driven recruitment and selection have the greatest impact, followed by performance evaluation and personnel development. The aspects of employee management, organizational culture and management systems serve a more supportive and complementary role.

This result confirms that, in the context of SMEs, focusing AI application on foundational HR processes will generate the most significant positive impact on the overall effectiveness of human resource management. Concurrently, systemic HR governance factors must also be considered for parallel development to ensure the synchronization and sustainability of the management platform..

4.Conclution and Implications

This study has elucidated the significant contributions of Artificial Intelligence to human resource management within Small and Medium-sized Enterprises (SMEs) in the current context of technological integration. The survey results and quantitative analysis demonstrate that AI has been instrumental in enhancing the effectiveness of HR functions through process automation, recruitment optimization, performance evaluation and resource development. The application of AI not only saves time and increases objectivity but also creates opportunities for identifying and nurturing talent, thereby better meeting the changing demands of the labor market.

Alongside these notable benefits, the research also highlights the challenges that SMEs must confront when adopting AI, such as investment costs, information security, the adaptability of the workforce and limitations related to flexibility and emotional factors in management. Nevertheless, the collaboration between technology and active human involvement is the key to ensuring sustainable effectiveness and preserving humanistic values throughout the digital transformation process.

From the findings presented, it can be affirmed that AI serves not only as a support tool but also as a driving force for the comprehensive development of human resource management in SMEs. The correct identification of investment priorities, the enhancement of the workforce's technological capabilities and the refinement of the management system are prerequisites for enterprises to adapt successfully, increase their competitiveness and achieve stable growth in the digital era.

Practical Implications for Manufacturing Enterprises

Based on the findings from the survey data analysis, several practical implications can be drawn for manufacturing enterprises in their process of applying AI.

Prioritize the Automation of Key Processes:

SMEs should focus on applying AI to production and management stages that have a significant impact in order to save time and reduce errors. Accurately identifying which stages can be automated will help allocate resources effectively and avoid wasteful investment in low-impact steps.

Invest in Building Technological Capacity for Personnel:

The effectiveness of AI is highly dependent on the workforce's ability to adopt and operate the technology. Therefore, enterprises need to develop practical digital skills training programs and raise awareness of digital transformation at all levels, tailored to their existing characteristics and resources.

Refine and Adjust Management Processes:

To maximize the benefits of AI, SMEs need to flexibly adjust their operational processes to accommodate the collaboration between humans and machines. This will also help enhance control over product and service quality, even with limited resources.

Proactively Adapt to Changes in Labor Structure:

The application of AI can lead to significant changes in work organization and employee roles. Enterprises must implement support plans, including career transition counseling, retraining and creating development opportunities for employees in higher value-added positions.

Recommendations for Policymakers

Government agencies should formulate practical support policies that create favorable conditions for SMEs to access AI technology. Measures such as investment incentives, financial support, human resource capacity building and the promotion of innovation need to be designed to suit the capabilities and scale of these enterprises.

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TÁC ĐỘNG CỦA KỶ NGHUYÊN TRÍ TUỆ NHÂN TẠO (AI) ĐẾN QUẢN LÝ NGUỒN NHÂN LỰC TRONG CÁC DOANH NGHIỆP VỪA VÀ NHỎ

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Tóm tắt: *Nghiên cứu này phân tích tác động của Kỷ nguyên Trí tuệ Nhân tạo (AI) đến quản lý nguồn nhân lực trong các doanh nghiệp vừa và nhỏ (SMEs) tại Việt Nam. Thông qua khảo sát 477 người trả lời, bao gồm cả quản lý và nhân viên và sử dụng phân tích dữ liệu bằng phần mềm SPSS, nghiên cứu đánh giá vai trò quan trọng của AI trong việc nâng cao hiệu quả tuyển dụng, đánh giá hiệu suất, phân bổ nhiệm vụ và phát triển nguồn nhân lực. Kết quả cho thấy AI đã góp phần tiết kiệm thời gian, nâng cao tính khách quan và tự động hóa nhiều quy trình nhân sự, đặc biệt là trong giai đoạn tuyển dụng, tuyển chọn và phát triển hệ thống quản lý.*

Tuy nhiên, việc áp dụng AI cũng đặt ra những thách thức, chẳng hạn như chi phí đầu tư ban đầu cao, lo ngại về bảo mật dữ liệu và nhu cầu thích ứng với những thay đổi công nghệ và chuyển dịch cơ cấu lao động. Vai trò của con người trong giám sát và kiểm soát vẫn rất quan trọng để đảm bảo tính linh hoạt và hiệu quả lâu dài. Nghiên cứu này cung cấp bằng chứng thực nghiệm để hỗ trợ các SMEs xác định các ưu tiên đầu tư AI, đồng thời đề xuất các định hướng chiến lược nhằm nâng cao năng lực công nghệ và hoàn thiện hệ thống quản lý nguồn nhân lực hiệu quả trong kỷ nguyên số.

Từ khóa: Quản lý nguồn nhân lực (HRM), Doanh nghiệp vừa và nhỏ (SMEs), Tuyển chọn và sử dụng nhân tài, Đánh giá hiệu suất, Trí tuệ nhân tạo (AI).