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AI-DRIVEN HRM AND EMPLOYEE INNOVATIVE BEHAVIOR THROUGH WORK ENGAGEMENT AND CREATIVE SELF-EFFICACY

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Abstract: The rapid advancement of artificial intelligence technology has accelerated the popularization of AI- Driven HRM among modern corporate organizations. Current academic literature predominantly concentrates on the efficiency advantages brought by this new-type human resource management model. Few scholarly works have further discussed how it influences employee Innovative behavior from the perspective of individual internal psychological mechanisms. Grounding on Self-Determination Theory (SDT), this study carries out quantitative questionnaire research targeting staff members from five Internet enterprises located in Zhengzhou City. The empirical results generated by PLS-SEM statistical analysis demonstrate that AI- Driven HRM can positively predict employee adaptability and employee Innovative behavior in the workplace, and adaptability presents a prominent mediating effect between the above two research variables. This research enriches the practical application scenarios of Self-Determination Theory in the intelligent human resource management field. It also offers feasible empirical references for enterprises to optimize internal innovative performance via the implementation of AI- Driven HRM.

Keywords: *AI-Driven HRM; Employee Innovative Behavior; Work Engagement; Creative Self-Efficacy; Adaptability*

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1. Introduction

In the era of rapid digital advancement, intelligent technologies have been widely embedded in organizational operations, leading a large number of Chinese enterprises to deploy artificial intelligence solutions in various management links. According to statistics from Tianyancha Professional Edition released on March 9, 2026, the total number of AI-related enterprises that are in operation or have been registered in China has exceeded 5.099 million, among which roughly 175,000 new enterprises were added by the same day. Over the past five years, the number of newly registered AI-related enterprises has maintained a continuous upward trend and peaked in 2025 (Xiaoxing Morning Post, 2026). Zhengzhou municipal authorities have also rolled out supportive policies, planning to provide AI application training for more than 50,000 people each year and create more than 60,000 AI-related jobs from 2025 to 2027 (Zhengzhou Daily, 2025). Under such circumstances, the popularization

of intelligent management tools makes it particularly important to examine the association between AI-Driven HRM and employee Innovative behavior among employees in Zhengzhou.

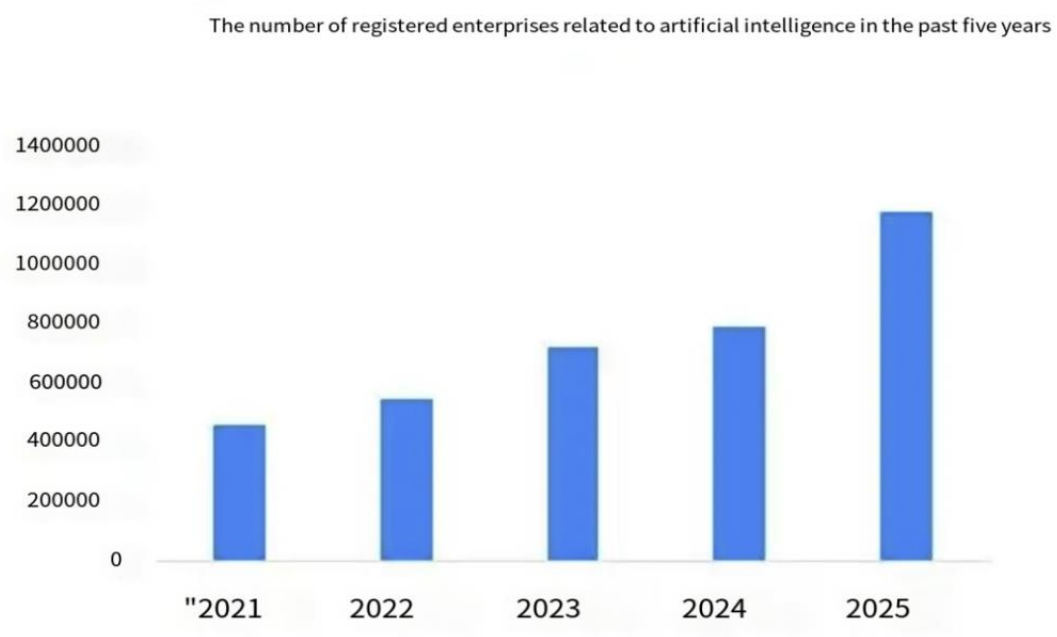

Figure 1. Number of registered enterprises in China involved in artificial intelligence over the past five years.
Sources: https://baijiahao.baidu.com/s?id=1859331523723667655&wfr=spider&for=pc

With the rapid growth of AI-related enterprises, the penetration of intelligent technology in corporate management has been increasing year by year. Industry data shows that the application coverage of AI-Driven HRM in Chinese enterprises rose from 18% in 2020 to 62% in 2025. Industries with a high level of digital transformation, such as the internet, finance, and high-end manufacturing, have reached an application rate of more than 80%. Meanwhile, corporate investment in AI-powered human resource management has kept an average annual growth rate of over 25% (China Academy of Information and Communications Technology, 2025). AI-Driven HRM has gradually replaced traditional human resource practices in recruitment, training, performance appraisal and incentive design, becoming a core method for enterprises to improve management efficiency and enhance human capital value (Do et al., 2025). As enterprises pay more attention to AI capability construction, customized training and knowledge-sharing assessment systems are promoting the transformation of human-machine collaboration, which has fundamentally changed the working environment, job requirements and competency expectations of employees (Zhang et al., 2023).

Year	AI-Driven HRM application coverage	The growth rate of enterprise AI HRM investment	Coverage rate of traditional industry applications
2020	18%	19.2%	9%
2021	27%	21.5%	15%
2022	36%	23.8%	22%
2023	47%	24.6%	30%
2024	55%	25.3%	38%
2025	62%	26.1%	45%

Figure 2: Current Development Status of AI-driven HRM Applications in Chinese Enterprises from 2020 to 2025
Source: Enterprise AI Human Resource Management Application Development Report (2025) published by the China Academy of Information and Communications Technology.

In today's fiercely competitive business landscape, sustained innovation has become the core underpinning for enterprises to secure long-term competitive advantages, and employee Innovative behavior, as the essential micro-foundation of organizational innovation, has increasingly emerged as a key research topic in human resource management (Zhang, Gao, & Li, 2023). Existing research has uncovered that AI-Driven HRM exerts a two-sided influence on employee conduct: on one side, intelligent management tools simplify work procedures, optimize decision-making logic, and elevate operational efficiency, which helps inspire employees' creative thinking and enable them to better tap into personal potential (Jangbahadur et al., 2025); on the other side, the integration of artificial intelligence may bring technological burden, narrow the scope of independent work, and raise the pressure of role adjustment, thereby somewhat restraining employees' enthusiasm for innovation (Zhang, Gao, & Li, 2023). Previous studies have examined the influence of AI on employee innovative outcomes. The application of AI may generate different effects on employee Innovative behavior, as it can facilitate innovation by improving work efficiency and providing new support, while also bringing challenges related to technological adjustment and adaptation. AI-Driven HRM has been found to influence employees' adaptive performance through certain psychological mechanisms, suggesting that greater attention should be given to individual responses in technology-based management environments (Zhang, Gao, & Li, 2023; Do et al., 2025).

Positive psychological states in the workplace provide stable motivation for employees' innovative actions. work engagement, as a positive work-related psychological state characterized by vitality, dedication and concentration, plays an important role in promoting proactive performance (Mazzetti et al., 2023). Employees with high work engagement usually have stronger internal motivation, are more willing to participate in work improvement activities and put forward new solutions. Relevant studies have confirmed that work engagement is positively correlated with employee Innovative behavior (Corbeanu & Iliescu, 2023). Another key psychological factor is creative self-efficacy, which refers to individuals' confidence in their ability to generate new ideas and solve problems creatively (Amjad et al., 2024). Studies have shown that employees with higher creative self-efficacy are more active in innovative practices, more persistent in the face of difficulties, and more likely to show innovative behaviors (Raihan & Uddin, 2023).

The adaptability of employees has become an important ability to adapt to technological changes. Adaptability refers to the ability of an individual to adjust their own behavior and cognitive patterns when facing environmental changes. When enterprises implement artificial intelligence technology, employees need to learn new systems and working methods. Adaptable employees can master AI tools more effectively, thereby enhancing work efficiency and innovative performance. Employees with low adaptability find it difficult to keep up with technological changes and cannot benefit from AI-driven human resource management (Ghosh, 2025).

Artificial intelligent-driven human resource management has been widely applied in various industries, but the research on its relationship with employees' innovative behaviors is still in its infancy and no unified conclusion has been reached yet. Most previous studies have focused on outcome variables at the organizational level, such as performance, productivity and digital transformation, while paying less attention to the individual psychological mechanisms of employees. Few studies have systematically explored how AI-driven human resource management influences employees' innovative behaviors through psychological mediators such as job engagement and creative self-efficacy, and there are also few studies that have tested the boundary effect of employees' adaptability.

To fill these research gaps, this study takes AI-Driven HRM as the independent variable and employee Innovative behavior as the dependent variable. work engagement and creative self-efficacy are set as mediating variables, and adaptability as a moderating variable, so as to construct a complete research model. This study aims to reveal the psychological path through which AI-Driven HRM affects employee Innovative behavior and verify the moderating role of adaptability. The research results will enrich the theoretical system of the integration of artificial intelligence and human resource management.

This study is based on Self-Determination Theory, which explains the internal motivation mechanism of AI-Driven HRM affecting employee innovation and expands the application of the theory in the digital human resource management field. Practically, the results can help employees improve their work engagement and creative self-efficacy to promote personal career development. For enterprises, this study provides a basis for formulating differentiated management strategies and targeted training for employees with different adaptability levels. For policymakers and industry practitioners, the conclusions can support the optimization of AI applications in human resource management and the formulation of digital economy policies, and help promote decent work and sustainable economic growth, which is in line with the United Nations Sustainable Development Goals.

2. Literature Review

2.1 Theoretical foundation

Self-Determination Theory (SDT) puts forward that individual motivation and behavioral choices are significantly shaped by the satisfaction level of three core psychological needs, namely autonomy, competence and relatedness (Do et al., 2025; Zhang et al., 2023). Existing theoretical research indicates that staff can develop strong intrinsic work motivation when they receive sufficient organizational support, obtain higher workplace autonomy, and gain abundant personal growth and development resources (Alwali & Alwali, 2025; Do et al., 2025). This positive motivational state further encourages individuals to maintain positive working attitudes and engage in positive workplace behaviors.

With the comprehensive penetration of artificial intelligence technologies in daily life and industrial scenarios, AI-Driven HRM has been widely popularized and applied in modern enterprise management (China Academy of Information and Communications Technology, 2025; Zhang et al., 2023). In the context of AI-Driven HRM, intelligent management tools and digital means deliver multidimensional support for enterprise employees. Specifically, these tools optimize internal communication efficiency, launch personalized vocational training programs, output precise performance evaluation results, and flexibly adjust work modes (Alzeiby et al., 2025; Jangbahadur et al., 2025). Such human-oriented management practices effectively strengthen employees' perceived competence and workplace autonomy, which further stimulates their active willingness to cope with environmental changes and carry out creative practices. This study adopts Self-Determination Theory as the core theoretical basis to clarify the internal influence mechanism of AI-Driven HRM on employee adaptability and employee innovative behavior (Do et al., 2025).

2.2 Hypotheses development

The impact of AI-Driven HRM on work engagement.

AI-Driven HRM simplifies repeated administrative tasks and offers clearer working support, allowing employees to focus more on their core responsibilities rather than trivial affairs, which effectively improves their work engagement (Alzeiby et al., 2025). With more efficient and transparent management arrangements, employees feel more recognized and supported, and they are more willing to devote energy and enthusiasm to their daily work, thus maintaining a higher level of work engagement (Jangbahadur et al., 2025).

H1a: AI-driven HRM has positive and direct effect on work engagement of employees.

The impact of AI-Driven HRM on creative self-efficacy

AI-Driven HRM provides personalized learning paths and objective performance feedback, helping employees recognize their own creative potential and gradually build confidence in creative tasks (Abbas & Abbas, 2023). When individuals receive stable support for innovation and development, their belief in their ability to generate new ideas will be strengthened, which directly promotes the improvement of creative self-efficacy (Tierney & Farmer, 2002).

H1b: AI-driven HRM has positive and direct effect on creative self-efficacy of employees.

The influence of work engagement on employee's innovative behavior

Employees with higher work engagement usually take the initiative to think about improvements in work and actively explore better solutions, which provides a solid foundation for the occurrence of employee Innovative behavior (Scott & Bruce, 1994). Continuous investment in work helps individuals accumulate practical experience and professional insights, making them more willing to turn creative ideas into real actions and promote the implementation of innovation (Raihan & Uddin, 2023).

H2: Work engagement has positive and direct effect on innovative behavior of employees.

The influence of creative self-efficacy on employee's innovative behavior

Creative self-efficacy reflects employees' trust in their own creative ability, and those with stronger self-belief are more likely to break through traditional thinking and carry out innovative attempts, thereby promoting employee Innovative behavior (Tierney & Farmer,

2002). Such positive psychological state reduces hesitation and fear in the innovation process, encouraging individuals to put forward new methods and implement them steadily in practice (Scott & Bruce, 1994).

H3: Creative self-efficacy has a positive and direct effect on innovative behavior of employees.

The impact of AI-Driven HRM on employee's innovative behaviors through the mediating role of work engagement

AI-Driven HRM enhances work engagement by optimizing management processes and enriching job resources, laying a psychological foundation for subsequent innovation (Alzeiby et al., 2025). When employees maintain a high level of work engagement, they are more motivated to discover problems and create solutions, so work engagement transmits the positive influence of AI-Driven HRM into concrete employee Innovative behavior (Zhang et al., 2023).

H4a: Work engagement mediates the relationship between AI-driven HRM and Innovative behavior

The impact of AI-Driven HRM on employee's innovative behaviors through the mediating role of creative self-efficacy.

AI-Driven HRM strengthens creative self-efficacy by providing innovation support, skill development, and fair evaluation mechanisms (Abbas & Abbas, 2023). As creative self-efficacy increases, employees become braver and more capable in innovative practice, so this factor acts as an important bridge connecting AI-Driven HRM and employee Innovative behavior (Amjad et al., 2024).

H4b: Work engagement mediates the relationship between AI-driven HRM and Innovative behavior

The moderating role of adaptability in the relationship between AI-driven HRM and work engagement

Employees with strong adaptability can quickly adjust to the new working mode brought by AI-Driven HRM and better enjoy the convenience of intelligent management, which strengthens the positive impact on work engagement (Van Dam & Meulders, 2020). For those with low adaptability, changes in management systems may cause extra pressure, weakening the promotion effect of AI-Driven HRM on work engagement, which confirms the regulatory role of adaptability (Ahmed et al., 2024).

H5a: Adaptability of employees moderates the positive relationship between AI-driven HRM and work engagement.

Adaptability as a moderator between AI-driven HRM and creative self-efficacy

Employees with high adaptability can actively use the learning and innovation resources provided by AI-Driven HRM, so their creative self-efficacy improves more significantly (Ghosh, 2025). In comparison, employees who are not good at adapting to changes cannot fully absorb the support of intelligent management, which limits the improvement of creative self-efficacy and reflects the regulatory effect of adaptability (Van Dam & Meulders, 2020).

H5b: Adaptability of employees moderates the positive relationship between AI-driven HRM and creative self-efficacy.

3. Research Methods

3.1 Type of Research and Location

This study employs quantitative methods and a cross-sectional survey design to explore the relationship among artificial intelligence-driven human resource management, adaptability, job engagement, creative self-efficacy, and employee innovative behavior. The survey was conducted among employees working at five Internet companies in Zhengzhou City, Henan Province, China from March 2026 to May 2026. As the capital city of Henan Province, Zhengzhou was the first to receive government support and introduce policies to strongly encourage companies to apply and develop AI-driven human resource management. As the first Internet industry to come into contact with AI management systems, this study selected a total of 1,730 employees from five Internet companies, which can better reflect the relationships among the variables of this research. Data collection was carried out through standardized online and offline questionnaire models, and the selection criteria included full-time work in various departments of the company, exposure to AI-driven human resource management systems, participation in daily intelligent management processes, engagement in knowledge-intensive work that requires adaptability, job engagement, creative self-efficacy, and employee innovative behavior. A total of 343 valid responses were collected through the China Wenjuanxing app for final statistical analysis.

3.2 Research Variables and Hypotheses

AI-driven HRM is a new type of people management that employs artificial intelligence technology in all aspects of people management to improve the efficiency of management and strengthen the abilities of employees (Do et al., 2025). The main components of AI-driven HRM include employee AI adaptation and communication (e.g., using AI for ability evaluation in recruitment, providing AI training, building AI knowledge-sharing evaluation and incentive mechanisms) and human-machine cooperation (e.g., designing human machine collaborative work tasks and constructing human-machine team working modes).The measurement indicators of AI-driven human resource management in this study include AI-based recruitment and selection support, intelligent performance evaluation, AI-based training and development, and data-driven decision support (Do et al., 2025).

Adaptability is an employee's ability to change their own behavior and maintain work efficiency quickly when the working environment, work process or other work methods are changed due to changes in technology and organization (Van Dam & Meulders, 2020).Indicators used to measure adaptability include behavioral adjustment, learning ability under change, flexibility in problem-solving, openness to new technologies, and maintaining performance under changing working conditions (Van Dam & Meulders, 2020).

Work engagement refers to a positive and lasting psychological condition that employees display while performing their job roles (Schaufeli et al., 2006). It includes three core dimensions: physical energy, professional development, and social value contribution. Among these components, vitality describes the robust mental energy and healthy mindset that staff maintain in daily tasks. Dedication reflects employees' recognition of job meaning, passion for work, and sense of achievement. Absorption means that individuals stay highly focused and fully devoted to their work assignments.The indicators of work engagement are measured by vitality, dedication and absorption in accordance with the UWES framework (Schaufeli et al., 2006).

Creative self-efficacy represents individuals' belief in their own creative capacity, including the ability to solve problems innovatively, assist others in developing new thoughts, and put forward original ideas (Tierney & Farmer, 2002). As a critical psychological driver, this factor strongly influences employees' motivation to take part in creative activities and is mainly measured as a single-dimensional construct.The measurement indicators include confidence in generating new ideas, the ability to develop creative solutions, and the belief in handling creative challenges (Tierney & Farmer, 2002).

Employee innovative behaviour refers to the collection of behaviours in which employees actively engage in creative exploration, generate new ideas, proactively promote creativity and strive for resources, and formulate and implement creative implementation plans during their work. (Scott & Bruce, 1994). It is the micro-level behaviour of an organisation's innovation.Its indicators include thought exploration, thought generation, thought promotion and the implementation of thought in workplace activities (Scott & Bruce, 1994).

Based on the conceptual framework (Figure 3), 8 hypotheses (H1a to H5b) were proposed in this study. Through these seven hypotheses, the direct and indirect influences (as well as mediating effects) between variables were examined.

3.3 Conceptual Framework

The conceptual framework diagram of this article, in combination with self-determination Theory (SDT), constructs a theoretical model of how human resource management based on artificial intelligence influences employees' innovative behavior through dual mediating paths of work engagement and creative self-efficacy, as well as how employees' adaptability moderates the intensity of these two paths. In the context of digital transformation, increase the specific volume of data regarding the use of artificial intelligence for innovation in human resources.

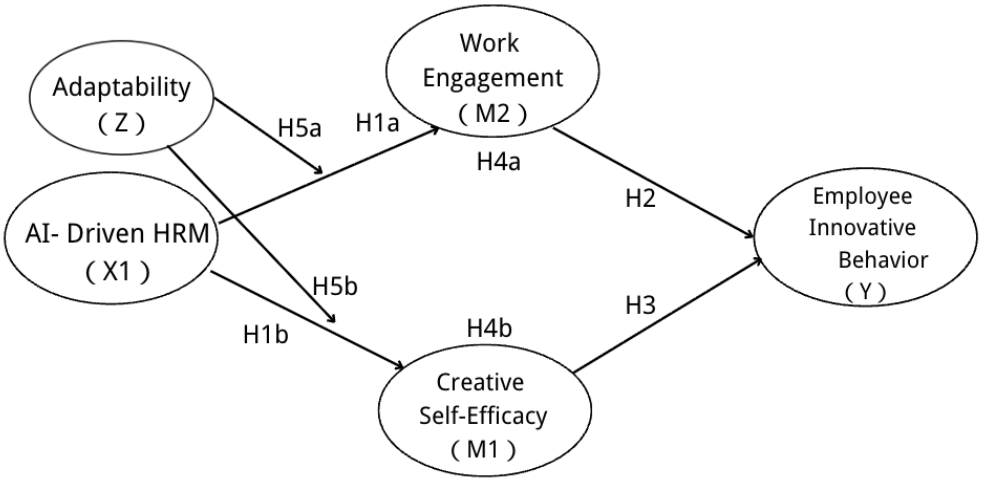

Figure 3. Research Conceptual Framework

Based on the conceptual model drawn above, this study proposes eight hypotheses to explore the causal relationships among variables.These hypotheses are developed on the premise that AI-Driven HRM exerts direct and indirect influences on employee Innovative behavior, with work engagement and creative self-efficacy acting as mediators, and adaptability serving as a moderator in the conceptual framework.

3.4 Data analysis Techniques

The current study utilised WarpPLS 8.0 software to run Partial Least Squares Structural Equation Modeling (PLS-SEM) for empirical data processing and statistical testing. The overall analytical process was divided into two systematic stages to ensure rigorous research outcomes. The first phase concentrated on evaluating indicator reliability and construct validity for the outer measurement model of the research framework. The subsequent second phase aimed to test the inner structural model, so as to verify hypothetical path connections as well as indirect mediating relationships among research variables.

Measurement model verification (external model): WarpPLS was adopted to set all latent variables as reflective constructs. The reliability of the indicators was first tested by combined loading and cross-loading. The external loads of each variable were all within the acceptable range of 0.707-0.861 and were significant ($p<0.001$). The internal consistency was further tested by Cronbach's coefficient (Cronbach's α) and combined reliability (CR). The α values of all variables were greater than 0.7 and the CR values were higher than 0.8, indicating good reliability. The average variance extraction (AVE) was all over 0.5, and the aggregated validity met the standard. According to the Fornell-Larcker criterion, the square roots of AVE of each variable are all greater than the corresponding correlation coefficients, and the discriminative validity is qualified. The total collinearity variance inflation factor (VIF) was all less than 5, with no serious multicollinearity or common method deviation issues. The quality of the measurement model met the requirements for structural model analysis.

Structural model verification (internal model): The structural model fitting and quality inspection showed that the average path coefficient (APC), average determination coefficient (ARS), and average adjustment determination coefficient (AARS) were all significant ($p<0.001$), and the Tenenhaus goodness of fit (GoF) was 0.612, reaching a high level. The Simpson's Paradox Ratio (SPR), Coefficient of Determination Contribution ratio (RSCR), and Nonlinear Bivariate causal Direction ratio (NLBCDR) all meet the standards. All direct path coefficients were significantly positive. The mediating and moderating effects were both tested. Work engagement and innovation self-efficacy played a partial mediating role between AI-driven human resource management and employees' innovative behaviors, while adaptability played a significant moderating role. The endogenous variable R^2 was as high as 0.74, and the Stone-Geisser Q^2 was all greater than 0.35. The model had good explanatory and predictive power. The effect size (f^2) of each path was reasonable, and the overall model adaptation and interpretation effect was excellent.

4. Results and Discussion

4.1 Results

Characteristics of Respondents

Through a sample survey of 1,730 employees from five Internet companies in Zhengzhou City, Henan Province, China, the distribution of respondents in various age groups was relatively uniform. Among them, the proportion of the age group aged 25 to 34 is higher than that of the four age groups under25 (25.36%), 35-44 (18.37%), 45-54 (17.49%), and 55and above (12.83%). The proportion of the 25-34 age group is 25.95%. The ratio of men to women in the sample is relatively close to 1, and the number of men and women is roughly the same. However, the proportion of respondents who received a bachelor's degree in tertiary education was relatively high, accounting for 40.52%. The respondents were also

distributed across different departments. Compared with the six departments of the Marketing Department (11.66%), finance department (23.03%), operations department (16.62%), product department (16.62%), and other departments (6.12%), the proportion of the human resources department was slightly higher. The proportion of the human resources department is 25.95%. These proportions can better indicate that the sample data and the staff show that most of them have moderate to rich experience in the Internet industry.

Table1. Descriptive Statistics of the Sample

Particular	Variable	Frequency	Percentage (%)
Age	Under 25	87	25.36
	25–34	89	25.95
	35–44	63	18.37
	45–54	60	17.49
	55 and above	44	12.83
Gender	Male	171	49.85
	Female	172	50.15
Education	High school or below	70	20.41
	College diploma	122	35.57
	Bachelor's degree	139	40.52
	Master's degree or above	12	3.5
Department	Human Resources	89	25.95
	Marketing	40	11.66
	Finance	79	23.03
	Operations	57	16.62
	Production	57	16.62
	Other (please specify: _____)	21	6.12
Work Experience	Less than 1 year	66	19.24
	1–3 years	105	30.61
	4–6 years	80	23.32
	7–10 years	48	13.99
	More than 10 years	44	12.83

Description of Variable Answers

The responses of these respondents to the research variables were measured. And the SPSS descriptive statistical mean of the main variables was greater than 3.00. Artificial intelligent-driven human resource management (X), adaptability (Z), creative self-efficacy (M1), and employee innovative behavior (Y) are all scored using the Likert 5-point scale, where 1 represents strong disagreement and 5 represents strong agreement. Work engagement (M2) is measured using the classic UWES-9 scale, which employs five frequency levels ranging from never (1) to always (5). The average score of AI-driven human resource management (X) is 3.65, the average score of adaptability (Z) is 3.59, the average score of creative self-efficacy (M1) is 3.3.68, the average score of employee innovative behavior (Y) is 3.83, and the average score of work engagement (M2) is 3.46. All these variables have an average score above 3.00, which is at a medium to high level. Among them, the average value of employees' innovative behavior (Y) is the largest. It can be seen that the overall behavior of the respondents is relatively positive.

Table 2. Descriptive Statistics of Research Variables

Variable	Mean	Standard Deviation
AI-Driven HRM	3.65	0.66
Adaptability	3.59	0.81
Work Engagement	3.46	0.70
Creative Self-Efficacy	3.68	0.75
Employee Innovative Behavior	3.83	0.77

Model Analysis Results

This study utilized the WarpPLS tool to conduct PLS empirical tests on the model and carried out reliability and validity tests on the measurement model. The data show that the factor loadings of all observed variables are higher than 0.7, and all have passed the significance test. The internal consistency coefficient and combined reliability of the scale are both greater than 0.7, demonstrating a stable and reliable measurement level. The average variance extraction values of each variable all exceeded 0.5, suggesting that the aggregated validity performed well. According to the Fornell-Larcker discrimination criterion, the discrimination between variables is qualified and there is no problem of overlapping recognition. In addition, the variance inflation factors of the entire model are all below 5, the problem of multicollinearity is not obvious, and the common method bias is effectively controlled. Overall, the quality of the measurement model meets the standards and can support subsequent path analysis. All the complete results mentioned are shown in the chart below.

Table 3. Reliability and Convergent Validity of the Measurement Model

Construct	Items	Loading Range	Cronbach's Alpha	CR	AVE
AI-Driven HRM (X)	12	0.722-0.814	0.921	0.932	0.534
Adaptability (Z)	10	0.730-0.816	0.914	0.926	0.558
Work Engagement (M2)	9	0.707-0.861	0.892	0.912	0.584
Creative Self-Efficacy(M1)	3	0.845-0.861	0.805	0.885	0.519
Employee Innovative Behavior (Y)	6	0.737-0.838	0.843	0.876	0.547

Table 4. Fornell-Larcker Criterion

Construct	X	Z	M2	M1	Y
AI-Driven HRM (X)	0.731	0.612	0.684	0.571	0.648
Adaptability (Z)	0.612	0.747	0.655	0.603	0.648
Work Engagement (M2)	0.684	0.655	0.777	0.669	0.721
Creative Self-Efficacy(M1)	0.571	0.603	0.669	0.848	0.734
Employee Innovative Behavior (Y)	0.648	0.626	0.721	0.734	0.740

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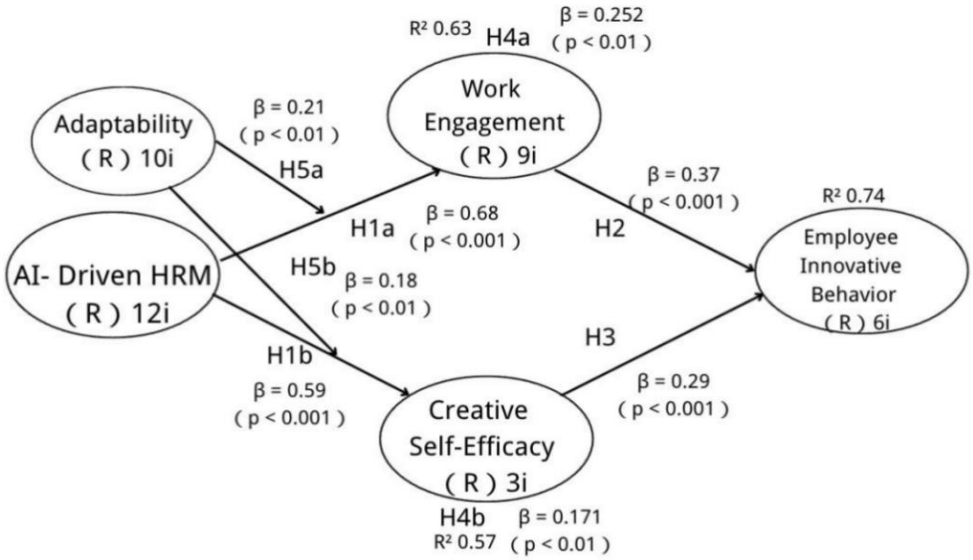

Figure4. Structural model results with path coefficients and R^2 values

The estimation results of the structural model in WarpPLS 8.0. Establish a model to study the direct and indirect impacts of human resource management based on artificial intelligence on adaptability, work engagement, creative self-efficacy and innovative behavior. The values on the straight line are the standardized path coefficients, and the values in the construction are R^2. Determine the best measurement quality and then establish a structural model of the recommended relationships among all variables. According to the results of WarpPLS, all the proposed direct paths are positive and statistically significant.

Table 5. Hypothesis testing results

Hypothesis	Path	β	P-Values	Result
H1a	X→ M2	0.680	< 0.001	Supported
H1b	X→M1	0.590	< 0.001	Supported
H2	M2 →Y	0.370	< 0.001	Supported
H3	M1 →Y	0.290	< 0.001	Supported
H4a	X → M2 → Y	0.252	< 0.01	Supported
H4b	X→ M1 → Y	0.171	< 0.001	Supported
H5a	Z× X→ M2	0.213	< 0.001	Supported
H5b	Z× X → M1	0.178	< 0.001	Supported

Structural model empirical analysis verifies every research hypothesis raised in this study. Direct effect findings reveal that AI-Driven HRM has positive correlations with work engagement, creative self-efficacy and employee Innovative behavior. Meanwhile, work engagement and creative self-efficacy are positively linked to individuals' intrinsic motivation for innovation.

Mediation analysis proves work engagement alongside creative self-efficacy serve as mediating channels between AI-Driven HRM and employee Innovative behavior, with two distinct indirect pathways forming a total indirect effect of 0.423 ($p < 0.001$). Given the modest direct impact from AI-Driven HRM to the targeted outcome, these two variables deliver partial mediating effects. Besides, adaptability significantly moderates the

associations between AI-Driven HRM and the two mediator variables; staff with higher adaptability cope better with the implementation of AI-Driven HRM. All empirical outcomes back up the constructed theoretical framework and confirm that AI-Driven HRM effectively stimulates employees' innovative performance.

Table 6. Effect Sizes f^2

Path	f^2
X→ M2	0.632
X→ M1	0.574
M2→ Y	0.418
M1→ Y	0.286
X→ Y	0.243

AI-Driven HRM serves as a general predictor for both employee engagement (f^2=0.632) and creative self-efficacy (f^2=0.574). Thus, the AI-Driven HRM system can help promote the psychological and motivational health of employees at work in a company.

Work engagement is the factor that affects employees innovative behaviour to a greater extent (f^2=0.418), and creative self-efficacy is relatively lower (f^2=0.286). AI-Driven HRM also has a relatively large direct effect (f^2=0.243). Adaptability moderately moderates the effect of AI-Driven HRM on both work engagement and creative self-efficacy.

As shown in Table 4. the positive impacts of AI-Driven HRM on work engagement, creative self-efficacy and employees innovative behaviour are presented below. Based on the results of mediation analysis, work engagement and creative self-efficacy together mediate the effect of AI-Driven HRM on employees innovative behaviour. As both the direct and indirect effects have reached a considerable extent, this study designates it as partial mediation. Thus, the empirical results support hypotheses H4a and H4b.

Table7. R^2 Coefficients of Endogenous Constructs and Q^2 Predictive Relevance

Predictive relevance	R^2	Q^2
Work Engagement (WE)	0.63	0.621
Creative Self-Efficacy (CSE)	0.57	0.553
Employee Innovative Behavior (EIB)	0.74	0.728

Although adaptability (AD) is not considered an endogenous structure and therefore does not have R^2 or Q^2 values, it has still been shown that it is a necessary component of the model through a significant moderating effect and a meaningful effect size (f^2). Based on the above results, it can be seen that the connection between AI-Driven HRM and work engagement and creative self-efficacy is mediated by adaptability. Adaptability will be included in all parts of the research model as a driving force.

4.2 Discussion

The impact of AI-Driven HRM on work engagement.

Hypothesis 1a: AI-Driven HRM → Work Engagement

Empirical results confirm that AI-Driven HRM exerts a positive influence on work engagement. AI-Driven HRM represents an integrated personnel management framework designed to enhance employee motivation and clarify work direction within organizations (Alzeiby et al., 2025). At present, internet enterprises widely apply intelligent technologies in

recruitment, performance evaluation, skill training and daily interaction, which help employees access work information and feedback efficiently, lower the load of repetitive tasks, and thereby strengthen work engagement. Intelligent management platforms reduce daily operational obstacles, nurture an open organizational culture, make employees feel supported by the organization, and further strengthen their enthusiasm and dedication at work (Alwali & Alwali, 2025).

The impact of AI-Driven HRM on creative self-efficacy

Hypothesis 1b: AI-Driven HRM → Creative Self-Efficacy

Existing evidence shows that AI-Driven HRM effectively enhances employee creative self-efficacy. Through intelligent systems, enterprises can elevate overall operational efficiency and deliver new thinking for employee development in human resource practices. In the internet sector, AI tools are increasingly used to deliver personalized learning programs and capacity development, while offering real-time evaluation on individual competence and advantages (Bharathi et al., 2024). When employees can generate independent ideas and solve problems autonomously in various innovative practices, they gain a stronger sense of accomplishment, which further strengthens their creative self-efficacy.AI-Driven HRM serves as an effective approach to cultivate employees innovative potential.

The influence of work engagement on employees innovative behavior

Hypothesis 2: Work Engagement → Employee Innovative Behavior

Findings demonstrate that work engagement is positively associated with employee Innovative behavior. Employees with clear work goals usually show higher internal drive and are more willing to invest extra effort in daily tasks (Mazzetti et al., 2023). They tend to propose novel solutions and take active roles in corporate innovation activities. Amid fierce competition and fast-changing environments in internet industries, high work engagement encourages employees to update skills continuously and embrace changes, which in turn stimulates consistent innovative actions (Zhang et al., 2023). Employees' psychological investment and emotional states directly shape their innovative performance in the workplace (Scott & Bruce, 1994).

The influence of creative self-efficacy on employees innovative behavior

Hypothesis 3: Creative Self-Efficacy → Employee Innovative Behavior

Statistical results support that creative self-efficacy positively predicts employee Innovative behavior. Employees with strong creative self-efficacy tend to explore new problem-solving strategies, put forward improvement suggestions, and take appropriate innovative risks (Tierney & Farmer, 2002). For internet enterprises, a proactive mindset and pioneering spirit are critical to sustainable development. Higher creative self-efficacy corresponds with more frequent and stable innovative actions at work (Raihan & Uddin, 2023). Individual cognitive and psychological conditions directly affect employees' willingness and persistence in innovation practice.

The impact of AI-Driven HRM on employees innovative behaviors through the mediating role of work engagement

Hypothesis 4a: Mediating Role of Work Engagement

Work engagement plays a mediating role between AI-Driven HRM and employee Innovative behavior. AI-Driven HRM not only affects innovative actions directly but also facilitates innovation performance by elevating employees' work engagement (Do et al., 2025). The application of AI technologies optimizes management processes, improves work efficiency and experience for all staff, and helps build a more motivated, proactive and creative team (Jangbahadur et al., 2025). Thus, work engagement acts as a key psychological bridge connecting AI-Driven HRM and employee Innovative behavior.

The impact of AI-Driven HRM on employees innovative behaviors through the mediating role of creative self-efficacy.

Hypothesis 4b: Mediating Effect of Creative Self-Efficacy

Creative self-efficacy mediates the indirect influence of AI-Driven HRM on employee Innovative behavior. In human resource practices, AI systems enhance employees' innovative confidence through intelligent training, instant feedback and technical support, thus reinforcing their creative self-efficacy (Amjad et al., 2024). AI-Driven HRM supports innovation directly via organizational resources, and indirectly promotes innovative actions by improving positive psychological states (Li et al., 2025). These dual pathways jointly explain how intelligent human resource management stimulates employee innovation.

The moderating role of adaptability in the relationship between AI-Driven HRM and work engagement

Hypothesis 5a: Moderating Role of Adaptability

Adaptability moderates the relationship between AI-Driven HRM and work engagement.Employees with high adaptability accept organizational changes brought by AI more smoothly and adjust quickly to digital working scenarios (Ahmed et al., 2024). Under AI-Driven HRM systems, such employees usually maintain better work wellbeing and higher engagement levels. In contrast, those with low adaptability tend to feel anxious or uncertain toward technological changes, which may weaken their work engagement.

The moderating role of adaptability in the relationship between AI-Driven HRM and creative self-efficacy

Hypothesis 5b: Moderating Role of Adaptability

Adaptability significantly moderates the impact of AI-Driven HRM on creative self-efficacy. Employees with strong adaptability are more willing to learn new technologies, utilize intelligent tools and participate in corporate digital transformation (Ghosh, 2025). Supported by AI-Driven HRM systems, these employees dare to take innovative risks and further strengthen their creative self-efficacy. Adaptability reflects employees' willingness to embrace changes, cognitive preparedness for transitions, and the ability to develop innovative capabilities continuously (Van Dam & Meulders, 2020).

5. Conclusion

This study enriches the theoretical understanding of AI-Driven HRM and employee Innovative behavior by constructing an integrated model that incorporates AI-Driven HRM, work engagement, creative self-efficacy, adaptability and employee Innovative behavior. Based on Self-Determination Theory, this research reveals that AI-Driven HRM effectively promotes work engagement and creative self-efficacy, which in turn stimulate employee

Innovative behavior (Do et al., 2025). Different from prior literature that separates organizational technology and individual psychology, this work explores their interactive effects and verifies the internal psychological transmission path of intelligent human resource management. By introducing adaptability as a significant moderator, this study explains why employees respond differently to digital management systems, expanding the application scope of Self-Determination Theory in the AI context and supplementing research on individual differences in intelligent management scenarios (Van Dam & Meulders, 2020). In practice, the findings provide actionable suggestions for enterprises to promote digital HR transformation. Companies are advised to implement AI-Driven HRM in recruitment, performance evaluation and personalized training, streamline management processes, and prioritize employees' psychological needs to enhance work engagement and creative self-efficacy. Enterprises should also carry out targeted skill training and change guidance to improve employee adaptability, helping staff adapt to intelligent working environments. Only by combining technology application, psychological motivation and organizational support can firms continuously stimulate employee Innovative behavior and strengthen core competitiveness.

This research also has certain limitations that need to be addressed in future exploration. The study adopts cross-sectional data, which makes it difficult to fully determine the causal relationships among variables; the sample is restricted to internet industry employees in Zhengzhou, limiting the generalization of conclusions to other regions and sectors. In addition, data are collected through self-reported questionnaires, which may lead to common method bias and affect the objectivity of results. Future studies can use longitudinal or experimental designs to re-test the relationships between variables and enhance causal inference (Zhang et al., 2023). Expanding the sample scope to cover more industries, regions and cultural backgrounds will help improve external validity. Researchers may also include leadership styles, organizational innovation climate, technology acceptance and other factors to further explore the psychological and behavioral mechanisms of employees in AI-driven management scenarios, so as to form a more comprehensive and in-depth research system for AI-Driven HRM and innovation management.

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