
The Influence of Information Technology-Based E-HRM Transformation on Employee Performance through the Improvement of Human Resource Quality and Job Satisfaction

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ABSTRACT

Objective: The objective of this study is to evaluate the impact of e-compensation, e-learning, and e-performance appraisal on organisational performance, with employee satisfaction as a mediating variable.

Theoretical Framework: A conceptual research model illustrating the relationships between variables. Core of the model: several independent variables based on e-HRM (E-Learning, E-Performance Appraisals, E-Compensation Management) influence employee performance (Y) both directly and indirectly through employee job satisfaction (Z) as a mediating variable. X1: E-Learning Located at the top left. Represents an online/electronic learning system for employee competency development. X2: E-Performance Appraisals Located at the middle left. Includes an electronic performance appraisal system (feedback, rating, digital KPIs). X3: E-Compensation Management Located at the bottom left. Covers the management of salaries, benefits, and incentives through electronic platforms/automation. Z: Employee Job Satisfaction Located in the center; acts as a mediating variable that receives influence from X1, X2, X3 and transmits the influence to Y. Y: Employee Performance Located on the right. is the main dependent variable measured as the outcome of an organization/individual

Method: The methodology A total of 101 respondents were involved in this research. Data processing was carried out using the Structural Equation Modeling (SEM) method with a Partial Least Squares (PLS) variance-based approach.

Results and Discussion: Based on the reliability and convergent validity analysis, the Compensation Management construct demonstrates excellent measurement quality, with high reliability and an AVE value of 0.73 indicating strong indicator consistency and construct validity. The SEM-PLS analysis further shows that the model possesses strong explanatory power, with R-square values of 0.81, 0.83, and 0.84 for Compensation Management, Employee Satisfaction, and Employee Performance, respectively. These results confirm that the theoretical model has high structural accuracy and predictive validity.

Research Implications: The findings of this study can serve as a basis for policymakers, managers, or practitioners in designing more effective strategies based on variables that have been shown to have a significant impact. By identifying dominant factors, organizations can focus resources and policies on aspects that contribute most to improving performance, satisfaction, or other organizational goals. In addition, the PLS method used allows the research results to remain accurate even with a relatively limited number of respondents, making it applicable in real-world contexts that have data constraints.

Originality/Value: This research has a high level of originality because it uses a Structural Equation Modeling (SEM) approach based on Partial Least Squares (PLS) to analyze complex relationships among latent variables, which has not been widely used in the context or field of this study. This approach provides an advantage in analyzing predictive models with a relatively small sample size, thereby producing valid and reliable empirical findings.

Keywords: E-compensation; E-learning; Employee Performance; Human Resources; Technology

1. INTRODUCTION

Human resource management is a process of managing various issues related to employees, workers, managers, and other individuals within an organization to support the company's or organization's activities in achieving predetermined goals (Nie, 2024). Therefore, managers need to ensure that the organization has the right workforce, in the appropriate positions, and available when needed, so that they can perform their duties to help the company achieve its goals effectively and efficiently (Adiguzel et al., 2020). Every company generally has three human resource managers. Human resource management in carrying out its function of distributing workers to various fields within the organization according to their needs. The task of human resource management revolves around efforts to manage the human element with all its potential as effectively as possible so that adequate human resources can be obtained for the company. Human resources (HR) are one of the most important factors in a company or organisation (Rahmalinda et al., 2024). Human resources play a key role in the development of the company. Those who are classified or are HR personnel work within the organisation and function as drivers to achieve the established goals. Achieving the objectives of an organisation requires the utilisation and cooperation of various resources. The most important aspect is to build HR capable of delivering optimal performance to achieve shared goals within an organisation.



The key to achieving success in an organization or agency is determined by the performance of employees, therefore every organization or agency must see and control every employee who works and improve the workability of its employees to achieve the goals or visions that have been set (Indiyarningsih et al., 2020). Performance is someone who produces certain work results after fulfilling a number of requirements. Employee performance is the result of the interaction of various variables, namely the individual and the social environment. Employee performance is work performance or work results both in quality and quantity achieved by an employee in a unit period of time carrying out his work duties in accordance with the responsibilities assigned to him (Taliang et al., 2023). Performance is a set of results achieved in terms of quality and quantity from the achievement of tasks assigned to a person, or group, referring to the standards and criteria for achieving and implementing the work set. Performance is a set of results or work performance that is carried out in quality and quantity as well as the process of a person or group of people who carry out an activity or produce results in accordance with the authority and responsibility it carries by carrying out several procedures or requirements as well as the factors that support an activity that refers to standards and criteria to achieve predetermined results or goals.

Employee performance can be understood as the individual work results as they have completed the assigned tasks with previously established objectives. The work environment plays a crucial role in supporting workers to complete their tasks effectively and efficiently. (Burbar, 2021). Employee performance is important as it directly impacts the productivity of the company and the achievement of long-term goals (Vuong & Nguyen, 2022). With rapid advancements in technology, Electronic Human Resource Management (e-HRM) has emerged as a transformative approach, revolutionising traditional HRM practices and enabling organisations to leverage technology to enhance efficiency, effectiveness, and strategic decision-making. e-HRM refers to the integration of information technology (IT) into various functions and processes of Human Resource Management (HRM), including recruitment and selection, training and development, performance management, and employee engagement. By leveraging technology, e-HRM aims to improve the accuracy, accessibility, and timeliness of HR data, streamline HR processes, and enhance the overall HRM experience for both employees and managers.

Researchers and practitioners have shown considerable interest in the relationship between e-HRM and organisational success (Happy, 2024). Although some studies have provided strong evidence the practice of e-HRM can enhance organisational performance; other research has produced conflicting or inconclusive findings (Deepalakshmi et al., 2024). This variation in results highlights the need for further research to fully understand how e-HRM and organisational success are interconnected. The administrative role of e-HRM has been confirmed by researchers, who have shown its ability to automate HRM procedures and improve the efficiency of HR department outcomes. This role is based on the "automated style" of information technology management (Prasad & De, 2024). E-HRM systems go beyond administrative tasks and have the potential to minimise costs and maximise efficiency in routine operational activities such as electronic access control, payroll, attendance management, and employee record administration. This system serves to document HRM achievements in a standardised manner, facilitating data retrieval when needed, such as electronic bookkeeping. Qin et al. (2023) state that leveraging electronic information systems to automate administrative practices and provide data for organisational decision-making helps organisations maintain competitive advantage and enhance performance.

Regarding the implementation of e-HRM in effective training, it has been discussed in the literature, but no clear results have been reported. Some academics suggest enhancing the level of technical knowledge and skills for HR professionals, while others dismiss this aspect (Nyathi & Kekwaletswe, 2023). One of the most significant advancements in HRM is e-HRM. Every aspect of human life has been influenced by information technology; HRM is one of those areas and is a crucial component. Essentially, e-HRM refers to the utilisation of technology employed by companies to carry out various HR or personnel tasks, including recruitment, training, performance reviews, as well as career development and progression (Yue, 2024). Thus, this research is very important because it provides deep insights into the influence of digital technology on human resource management strategies, considering the role of HR as a key asset in achieving an organization's success.

This research focuses on the impact of e-HRM implementation on employee satisfaction and organisational performance. E-HRM enables an employee to perform HR-related activities becoming more comfortable, precise and structured, rather than done manually as before, thus employees tend to assume it as adequate job satisfaction. In an organisation, when internal management, especially related to HR, is conducted well and all its activities are assisted by technology, this triggers an improvement in organisational performance. This study aims to analyse whether e-compensation, e-training, and e-performance appraisal can impact organisational performance mediated by employee satisfaction conducted at PT. XYZ.

2. THEORETICAL FRAMEWORK

Employee performance can be influenced by some factors, one of which is motivation. Employee motivation at the company must be a serious concern in managing human resources (Shamaileh et al., 2023). Companies must pay attention to how to maintain and manage employee motivation at work so that they always focus on company goals. Maintaining employee motivation is very important because motivation is a driving force for every individual who underlies employees to act and do something. Employees will not do things optimally if they do not have high motivation from within themselves to excel at work. Motivation can be divided into two, namely positive motivation and negative motivation (Shakir et al., 2024). Positive motivation is the process of influencing people by giving the possibility of getting gifts while negative motivation is the process of influencing someone through the power of fear such as loss of recognition, money, or position. Research by Ingsih et al. (2024), which examines the effect of motivation on employee performance shows that motivation has a positive effect on

employee performance. Furthermore, research by Wang et al. (2024) about the effect of motivation on employee performance found that motivation has a positive and significant effect on employee performance.

In the rapidly evolving digital era, the role of virtual technology in the international business world, including in the field of human resource (HR) management, is becoming increasingly important (Gogia et al., 2024). This article aims to examine the influence of digital technology on HR management practices using a systematic literature review approach. The discussion highlights concrete principles related to the impact of digital transformation on HR management practices and explains key aspects that need to be considered, before presenting a conceptual framework that deepens our understanding of this phenomenon (Strohmeier, 2020). In the context of an increasingly connected and digitalized business environment, the need to thoroughly understand the impact of digital technology on human resource management has become increasingly urgent. The changes brought about by the digital era have fundamentally transformed the landscape of the world of work, affecting how organizations recruit, develop, and retain a quality workforce.

The importance of employee development as an organizational growth strategy is increasingly realized through the integration of digital technology in learning approaches. The articles included in this research highlight significant evolution in the way organizations deliver employee training and development, confirming the important role of digital technology as a key driver of change. First of all, e-learning platforms have completely changed the employee learning landscape. With online access to training materials, employees have the flexibility to learn at their own pace and schedule (Shamsudin & Velmurugan, 2023). This not only increases employee engagement, but also allows for more autonomous learning, where individuals can customize their learning experience according to personal preferences and needs. Webinars are an effective communication channel in delivering interactive training material. The presence of digital technology allows organizations to hold live learning sessions online, facilitating two-way dialogue between teachers and participants. This interactivity creates a more dynamic learning experience and enables the real-time exchange of ideas (Godavarthi et al., 2023). Mobile learning applications are a crucial aspect in ensuring learning accessibility anywhere and at any time. Employees are no longer limited by place and time constraints, but can access training materials via their mobile devices. This is key in supporting contextual employee development, enabling direct application of learning to everyday work contexts. Through the important role of digital technology in employee development, organizations can create a more personalized and contextual learning approach. Data analysis from learning platforms can help identify individual needs, create customized curricula, and measure training effectiveness more accurately. Thus, digital learning is the key to creating a skilled, responsive and adaptive workforce in an era of ongoing change.

3. METHODOLOGY

Population

The population in this study includes all operational and managerial employees working in the engineering maintenance division of PT XYZ, with a total of 101 respondents. The research sample consists of employees who have had more than five (5) years of service and possess homogeneous characteristics.

Data Collection Technique

Primary data was obtained directly from the research location through the distribution of closed questionnaires designed with written questions and addressed to management leaders. The completion of the questionnaire was conducted in person with the presence of the researcher or surveyor, who in this case consists of only one person. Each answer provided has been organised in a response format based on an ordinal rating scale with five levels, or known as the Likert scale. This scale is used to measure attitudes, opinions, and perceptions of individuals or groups towards the variables being researched.

Validity Test

In this study, the validity test was conducted by calculating the correlation between each item of the questionnaire and the total score of each variable using the Pearson Product Moment correlation technique:

$$r_{xy} = \frac{n \sum XY - (\sum X)(\sum Y)}{\sqrt{\{n \sum x^2 - (\sum X)^2\} \{n \sum Y^2 - (\sum Y)^2\}}}$$

that is:

n = number of respondents

X = item score

Y = total score

Steps in testing the validity in (Arief Prastito, 2005)

Data processing in this study was carried out using the Structural Equation Modeling (SEM) method based on Partial Least Squares (PLS) variance. The data analysis technique is a stage for processing and systematically.

SEM itself is a multivariate analysis method that combines factor analysis and regression, aiming to test the relationships between variables in a model, both the relationship between indicators and constructs as well as between constructs. Meanwhile, Partial Least Squares (PLS) is a multivariate statistical approach that compares several independent variables with a number of dependent variables.

4. RESULTS AND DISCUSSIONS

The indicators for the Employee Satisfaction variable consist of 13 statement items with 101 respondents. To meet the requirements of convergent validity, each statement of the Employee Satisfaction variable must have a value greater than 0.6. The following are the results of the convergent validity taken from the outer loading table in Smart PLS Table 1. The Employee Satisfaction variable consist of 13 statement items with 101 respondents.

Variabel	Employee Satisfaction	Convergent Validity Requirement	Conclusion
Z.01	0.83	> 0.6	Valid
Z.02	0.78	> 0.6	Valid
Z.03	0.57	< 0.6	Tidak Valid
Z.04	0.70	> 0.6	Valid
Z.05	0.89	> 0.6	Valid
Z.06	0.88	> 0.6	Valid
Z.07	0.90	> 0.6	Valid
Z.08	0.70	> 0.6	Valid
Z.09	0.72	> 0.6	Valid
Z.10	0.84	> 0.6	Valid
Z.11	0.85	> 0.6	Valid
Z.12	0.87	> 0.6	Valid
Z.13	0.88	> 0.6	Valid

Table 1 shows the results of the convergent validity test on the Employee Satisfaction variable. Based on the table, most indicators (Z.01–Z.13) have loading factor values greater than 0.6, which means they are valid, except for one indicator, Z.03 (0.57), which is below the threshold and is considered invalid. This indicates that almost all the items or indicators used to measure employee satisfaction have been able to represent the intended construct well and consistently. According to Gupta et al. (2024) in the book *Multivariate Data Analysis*, a minimum loading factor value of 0.6 indicates that the indicator has a sufficiently strong contribution to the latent construct being measured. The higher the loading factor, the better the relationship between the indicator and its construct. Therefore, The results of this table indicate that the research instruments used mostly meet the criteria for convergent validity and are reliable for use in the next stage of analysis, such as reliability tests and structural analysis. Conceptually, employee satisfaction is an important factor in improving organizational performance and productivity. Chaanine (2024) Two-Factor Theory explains that job satisfaction is influenced by motivator factors such as recognition, achievement, and responsibility, while dissatisfaction arises due to hygiene factors such as salary and working conditions. In the context of current HR digitalization, this view is reinforced by recent research by Ganguly et al. (2025), which emphasizes that the use of digital technology in HR management can enhance employee satisfaction through work efficiency, better communication, and transparency in the evaluation system. Thus, the results of this validity test reinforce the finding that the measurement tool used to assess employee satisfaction is already relevant to the conditions of modern, increasingly digitalized organizations. However, the invalid indicator Z.03 should be revised or removed to make the measurement model more accurate. This aligns with the opinion of Benitez et al. (2022) that any indicator with a value below the validity threshold needs to be reassessed to ensure the integrity of the research construct. Overall, the table shows that the employee satisfaction measurement model has met good validity standards, supports the feasibility of the research, and provides a strong foundation for analyzing the relationship between employee satisfaction, digital transformation, and organizational performance. The reliability value for the Compensation Management construct, which is very high, indicates that all indicators within this variable have strong internal consistency, meaning that each question item or indicator consistently measures the same concept. An Average Variance Extracted (AVE) value of 0.73 also indicates that more than 73% of the variance in the indicators is explained by the Compensation Management construct, while the remaining 27% is explained by measurement error factors (Figure 1).

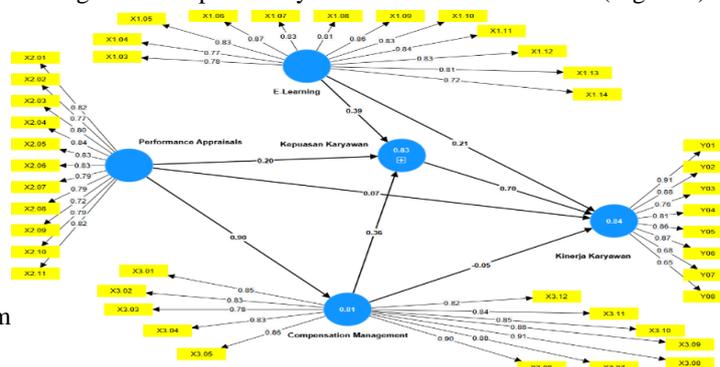


Figure 1. Path Diagram

Figure 1 shows a Partial Least Squares-based Structural Equation Modeling (SEM-PLS) analysis model consisting of two main components: the measurement model (outer model) and the structural model (inner model). The yellow boxes (X1.01–X3.12 and Y01–Y09) represent the measurable indicators of each latent construct (blue circles), while the arrows between constructs indicate the causal relationships tested in the study. The numerical values next to the indicators reflect the outer loadings or the strength of the relationship between the indicators and their constructs, while the numbers inside the blue circles indicate the R^2 values, which show how much of the variance in the endogenous constructs is explained by the other constructs that influence them. Values above 0.70 on the outer loadings indicate that the indicators have good convergent reliability, while high R^2 values (for example, 0.83 or 0.84) demonstrate that the model has strong explanatory power. According to Mishra et al. (2025), an AVE value above 0.5 is considered to meet the convergent validity criteria, so a value of 0.73 is very good and indicates that the measurement model has high quality in explaining the latent variable.

In the context of this study, the SEM-PLS model is used to examine the relationships between digital transformation of human resources (E-HRM), human resource quality, job satisfaction, and employee performance (Hermawan et al., 2020). Based on the results in Figure 1, it can be interpreted that the research instruments have met the criteria for validity and reliability, as indicated by the loading factor values, which are generally above 0.70, as well as composite reliability (CR) values above 0.70 and Average Variance Extracted (AVE) above 0.50. This indicates that the indicators are capable of explaining the latent variables well and consistently. Discriminant validity between constructs also needs to be ensured using the Fornell-Larcker criteria or the Heterotrait-Monotrait ratio (HTMT); if the HTMT value < 0.85 , it can be concluded that each construct has distinctiveness and there is no concept overlap.

The structural model in Figure 1 shows the direction and strength of relationships between latent variables through path coefficients that are significant based on the bootstrapping test. Positive and significant path coefficient values indicate that digital HR transformation has a positive effect on employee satisfaction, and in turn, this satisfaction positively impacts employee performance (Shamaileh et al., 2023). Thus, these results support the theory that the implementation of digital technology in HR management can enhance organizational effectiveness through improved processes, efficiency, and job satisfaction (Wang et al., 2024). From an economic perspective, these findings align with the views of experts such as Prasad & De (2024), who emphasize that human resource digitalization not only accelerates administrative processes but also creates added value through increased productivity and HR innovation.

With a high R^2 in the endogenous constructs (above 0.80), it can be concluded that the model has strong predictive power for employee performance variables. Nevertheless, researchers still need to conduct predictive relevance tests (Q^2) and effect size (f^2) to ensure the relative contribution of each variable to the overall model. In addition, multicollinearity testing (VIF) and common method bias testing need to be performed to ensure that the analysis results are more valid and free from systematic errors (Harkat et al., 2025). Theoretically, Figure 1 reinforces the conceptual model that HR digital transformation (E-HRM) and technology-based HR quality development can be key factors in enhancing modern organizational performance. In the context of the digital economy, an organization's ability to effectively leverage information technology will create a knowledge-based competitive advantage. As emphasized by the knowledge-based resource theory (Hamouche & Parent-Lamarque, 2023) and the dynamic capabilities theory (Yue, 2024), the model in Figure 1 is not only statistically valid but also has high economic and managerial relevance, particularly in efforts to strengthen workforce competitiveness and organizational effectiveness in the era of digital transformation.

The improvement in human resource quality has proven to be an important mediating variable in the relationship between digital transformation and employee performance. This aligns with the research by Setsena et al. (2021), which states that human resource quality is a key factor in bridging digital transformation towards enhancing organizational productivity. Employees who have adaptive technology skills and high digital competence are more capable of contributing to the achievement of organizational targets. This finding reinforces the results of research by Hermawan et al. (2020), which indicate that job satisfaction is a psychological factor capable of enhancing employee commitment and loyalty, especially in organizations undergoing digitalization of work processes. A digitally integrated work environment also provides flexibility, faster communication, and time efficiency, which positively impact motivation and job satisfaction. Thus, the results of this study not only provide empirical evidence for the interrelationships among variables in the SEM-PLS model but also offer strong managerial implications. Organizations are advised to continue developing digital HRM strategies oriented toward improving competencies, technology-based training, and reward systems that support employee job satisfaction.

R-square value of 0.81 indicates that 81% of the variability in the Compensation Management construct can be explained by the independent constructs in the model. This is a high figure and reflects the model's very strong explanatory power for the variable. The Adjusted R-square value of 0.80 indicates that the model remains stable even when taking the number of predictors into account, without any significant indication of overfitting (Table 2).

Table 2. Reliability and Validity Constructs

	<i>R-square</i>	<i>R-square adjusted</i>
<i>Compensation Management</i>	0.81	0.80
Employee satisfaction	0.83	0.83
Employee performance	0.84	0.83

The table 2 shows the R-square (R^2) and adjusted R-square (R^2 adjusted) values for the three main constructs, namely Compensation Management, Employee Satisfaction, and Employee Performance. The R-square value represents the proportion of variance of an endogenous variable that can be explained by the exogenous variables in the research model. The higher the R-square value, the greater the model's ability to explain the observed phenomena, thereby indicating strong structural validity of the tested model. Based on the results in the table, the Compensation Management construct has an R-square value of 0.81 and an adjusted R-square of 0.80, which means that about 81% of the variability in compensation management can be explained by other influencing variables, such as the reward system, perceptions of organizational justice, and company HR policies. According to modern labor economics theory, as explained by Zhao & Rabiei (2023).

Effective compensation management is an important instrument in regulating workforce efficiency and maximizing productivity, as compensation serves as the main signal of an employee's contribution to the company. Furthermore, the Employee Satisfaction variable has an R-square value of 0.83, indicating that 83% of the variation in employee satisfaction levels can be explained by factors such as compensation management, work environment, and leadership. This result aligns with the view of Chaanine (2024), who stated that job satisfaction is the outcome of the alignment between an individual's expectations of rewards and the reality they receive. With an adjusted R-square also of 0.83, this model is stable and does not show any signs of overfitting, indicating that the independent variables consistently contribute to explaining employee satisfaction. Finally, the Employee Performance construct obtained an R-square value of 0.84 and an adjusted R-square of 0.83. This indicates that 84% of the variation in employee performance can be explained by the preceding factors, particularly job satisfaction and compensation management. This value is considered very high in the context of socio-economic research, indicating that the model has strong explanatory power. Based on Li et al. work motivation theory (2023) as well as Majrashi labor efficiency theory (2025), employee performance increases significantly when intrinsic and extrinsic satisfaction is met through fair compensation and a proportional reward system. Overall, the three R-square values above (0.81; 0.83; and 0.84) indicate that the structural model built in this study has very good predictive quality. This means that the latent variables used are able to explain the relationships between constructs with a high degree of accuracy.

According to Godavarthi et al. (2023), an R-square value above 0.75 is categorized as "strong" in Partial Least Squares (PLS)-based research, indicating that the model is not only statistically fit but also theoretically and empirically relevant. Thus, this finding strengthens the argument that good compensation management significantly affects employee satisfaction and performance, supporting human resource economic theory which states that incentives and compensation fairness are key drivers of labor productivity in the long term.

5. CONCLUSION

Based on the results of reliability and convergent validity analysis, the Compensation Management construct has been proven to have very good measurement quality. High reliability values indicate internal consistency among indicators, while an AVE value of 0.73 confirms that most of the variance in the indicators can be strongly and significantly explained by the construct. This means that the instrument used in this study is valid and reliable in representing the concept of compensation management. Based on the results of data analysis using the Structural Equation Modeling – Partial Least Squares (SEM-PLS) approach, it can be concluded that this research model has a very strong explanatory power (R-square) for the main variables, namely Compensation Management, Employee Satisfaction, and Employee Performance. The high R-square values—0.81, 0.83, and 0.84, respectively—indicate that the exogenous variables in the model are able to explain most of the variation in the endogenous variables significantly and consistently. This shows that the developed theoretical model has excellent structural and predictive validity.

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