

## EXAMINING THE IMPACT OF ARTIFICIAL INTELLIGENCE INTEGRATION IN HUMAN RESOURCE PRACTICES ON EMPLOYEE PERFORMANCE THROUGH EMPLOYEE ENGAGEMENT

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### Abstract

This study highlights the growing importance of technological transformation in shaping organizational outcomes. The study aims to examine how organizational technological practices influence employee performance, with a particular focus on the mediating role of employee engagement. A quantitative, cross-sectional research design was employed, and data were collected from managers working in the manufacturing sector. The analysis was conducted using SPSS and SmartPLS, ensuring robust measurement and structural model assessment. The findings reveal that technological integration has a significant positive effect on both employee engagement and performance, while engagement also positively influences performance. Additionally, the mediation analysis confirms that employee engagement plays a crucial role in linking organizational practices to performance outcomes. These results underscore the importance of adopting a human-centric approach to technological transformation, emphasizing the role of employee engagement in achieving sustainable organizational success.

### INTRODUCTION

The rapid diffusion of digital technologies has reshaped organizational structures, decision-making processes, and the nature of work itself. In contemporary discourse, there is increasing attention to how intelligent systems are redefining managerial practices and altering employee-organization relationships. Scholars have begun to view technological transformation not merely as an operational enhancement but as a socio-technical shift that influences workplace behavior, motivation, and productivity. This transition is

particularly visible in knowledge-intensive and service-oriented sectors, where data-driven tools increasingly support or replace traditional human judgment (Zhang, 2024). At the same time, organizations are under pressure to remain competitive in volatile environments, prompting them to adopt advanced systems that promise efficiency and strategic advantage. However, such transformations are not without complexity. The integration of intelligent systems often challenges established norms, raises concerns about job security, and reshapes employee experiences in subtle yet profound ways (Ateeq et al., 2025).

Consequently, contemporary research has moved beyond purely technological perspectives to examine how these changes influence human dynamics within organizations. This evolving debate highlights the need to better understand how technological advancements interact with behavioral and organizational outcomes in modern workplaces.

Recent literature has increasingly examined the organizational implications of intelligent technologies, particularly within managerial and operational domains. Empirical studies suggest that technological integration can enhance efficiency, streamline processes, and improve decision-making quality (Gupta et al., 2024; Chin et al., 2024). At the same time, research indicates that such advancements can positively influence workplace attitudes and behavioral outcomes when implemented effectively (Prentice et al., 2023). Scholars have also highlighted that employee-related outcomes are shaped by how technology is embedded within organizational practices. For instance, studies have found that supportive leadership, organizational culture, and skill alignment play critical roles in determining whether technological adoption leads to improved outcomes (Wijayati et al., 2022; Rožman et al., 2023). However, the literature is not entirely consistent. While some studies report strong positive effects, others point to challenges such as resistance to change, ethical concerns, and uneven impacts across employee groups (Ncube et al., 2025). These mixed findings suggest the need for further investigation.

Intelligent technologies are being rapidly adopted by companies as part of digital transformation initiatives. Recent industry reports show that companies using cutting-edge digital technologies report gains in productivity and efficiency, but also report problems with employee adaptation and skill development (Zhang, 2024). In developing countries such as Pakistan and other emerging markets, these issues may be further exacerbated by a lack of technological infrastructure and employee preparedness. A further key challenge is the nature of work. With the rise of automation and data-driven technologies, employees must learn to perform new tasks that focus on cognitive

and analytical abilities. This can affect engagement in the workplace, as workers may feel uncertain, have a more complex job, or have less autonomy (Ateeq et al., 2025). Moreover, companies need to strike a balance between technological innovation and human-centered practices to ensure employee productivity and engagement. At the firm level, there is also a concern about the effectiveness of technology investments on performance outcomes. Although companies anticipate performance benefits, how these benefits arise is not clear. The gap between technology adoption and outcomes highlights the need to consider the mechanisms that connect organizational practices to employee outcomes.

While there is extensive research on technological change in organizations, there are a number of key gaps. First, the majority of research has examined direct links between technological practices and organizational outcomes, neglecting the underlying mechanisms that link these practices to outcomes. Although research has recognized the role of human factors, there is a lack of empirical evidence on how work experiences play a role in the relationship between technological practices and performance outcomes (Mahajan et al., 2026; Alzeiby et al., 2025). Second, previous studies have yielded mixed results about the benefits of technological integration. Some research shows substantial positive impacts on employee-related outcomes, while others point to limited or even negative impacts, potentially due to change resistance or a misfit with the organizational culture (Ncube et al., 2025). These mixed findings indicate that the link is not a simple one and may be mediated by factors yet to be fully explored.

Third, there is a dearth of context-specific studies, especially in emerging economies, where the structural, cultural and resource conditions are very different from developed countries. Current research often lacks specific context, and generalizes findings, reducing their relevance. Finally, while new research has started to incorporate behavioral aspects, it often focuses on them as dependent variables, rather than key explanatory factors (Priya et al., 2024; Jangbahadur et al., 2025). This leaves a gap in knowledge about how practices impact

performance through employee-focused processes. Overcoming these challenges is necessary to gain a deeper understanding of the role of technology in today's organizations.

The issue of technological transformation in organizations is important for both theoretical and practical considerations. Academically, the topic adds to the debate in the fields of human resource management, organizational behaviour and technology management. It offers a chance to develop models by integrating human factors into technology-focused models (Sharma et al., 2025). In terms of practice, companies are heavily investing in digital transformation programs, but often fail to deliver the anticipated benefits. A lack of understanding of the impact of these investments on human behaviour and performance may lead to under-leveraging technology. This issue is especially pertinent in the context of sustainable growth, where the integration of technological innovation and human capital is critical for success (Chin et al., 2024). This problem also resonates with policy goals, such as those of the United Nations Sustainable Development Goals, especially SDG 8, which focuses on decent work and economic growth. Proper technology integration can boost productivity and job quality, but only if it is done in a manner that promotes employee well-being and engagement. Thus, solving this issue is relevant not just for the organization, but for socio-economic progress.

This research adds to the body of knowledge by providing a more holistic view of the impact of technological change on organizations. It highlights the processes that link organizational practices to individual employee outcomes, rather than direct effects. The emphasis on the underlying processes that link these relationships offers insights into value creation processes within organizations. Further, it builds on existing research by drawing on recent empirical evidence and resolving inconsistencies found in earlier research (Mahajan et al., 2026; Gupta et al., 2024). The research will have a theoretical and practical impact by shedding light on how organizational practices affect performance. It is built on Social Exchange Theory and the Technology Acceptance

Model, which explain how organizational support and perceived usefulness influence employee attitudes towards technological change (Prentice et al., 2023; Dutta et al., 2023). This combined approach provides a holistic view of the impact of technological initiatives on outcomes. This perspective offers insights for managers to align technology strategies with human resource strategies.

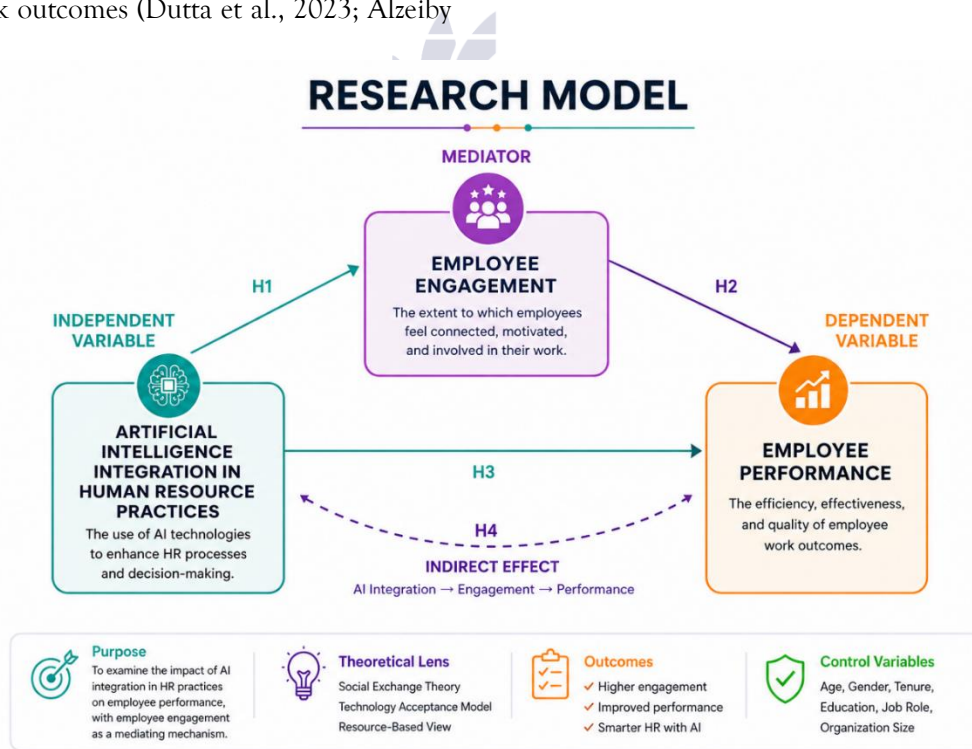
## Theoretical Foundation

This research is based on Social Exchange Theory (SET), a cornerstone theory in organizational behavior that accounts for the development of relationships through reciprocal exchanges between people and their surroundings. The theory was first proposed by George C. Homans (1958) and later expanded by Peter M. Blau (1964), and it assumes that social interactions are based on an exchange process whereby individuals aim to achieve a positive balance between rewards and costs. In the workplace, SET implies that when employees receive positive treatment, support or investment from the organization, they will respond in kind with positive attitudes and behaviours. These exchanges are not just economic, but also social and psychological, and include trust, obligation, and commitment.

Social Exchange Theory has grown from its initial economic metaphors to include more complex psychological and social aspects. Recent research stresses the importance of perceived organizational support, justice and relationship quality as key components of exchange relationships. Recent research has further developed the theory by incorporating it with contemporary workplace dynamics, especially those associated with technological change. For example, contemporary studies show that employees' perceptions of the intentions and support provided by their organizations are vital in determining how they respond to digital transformation and other organizational changes (Prentice et al., 2023; Ateeq et al., 2025). This development is part of a trend towards recognizing the impact of intangible organizational practices on employee thinking and actions in a rapidly changing workplace.

The significance of SET to the current study is that it helps explain how employees respond to and reciprocate organizational initiatives. In the dynamic technological work environment, employees assess whether changes to the workplace are beneficial or burdensome. If these initiatives are judged to be helpful and supportive, they create a feeling of indebtedness that motivates positive organizational attitudes and improved performance. However, if these changes are perceived as invasive and not meeting employee needs, they can undermine relational ties and motivation. This perception process, as outlined in SET, offers a powerful framework to explain the link between practices and behaviour. The recent empirical findings continue to show the relevance of Social Exchange Theory in modern organizations. Research shows that when employees perceive practices to be supportive and conducive to their professional development, they are more likely to engage in their work and achieve better work outcomes (Dutta et al., 2023; Alzeiby

et al., 2025). Moreover, researchers have used SET to investigate the human aspects of digital transformation, revealing that responses to technological change are influenced by perceptions of reciprocity and fairness in the workplace (Jangbahadur et al., 2025; Ncube et al., 2025). These studies confirm the theory's usefulness in understanding the effects of contemporary organizational practices on employee responses through relational processes. Using Social Exchange Theory as the intellectual framework of this study enables a consistent account of the impact of organizational actions. Rather than considering organizational practices as one-off actions, SET conceptualises them as part of an exchange relationship that influences employee perceptions and behaviours. This approach offers a holistic and theoretical lens to explain the relationship between organizational practices and employee outcomes in modern organizations.



**Hypotheses Development**

In today's world, organizations are increasingly using smart systems to support decision-making,

automate administrative tasks and manage human resources. In this dynamic environment, researchers have started to explore the effects of

technological integration on organizational processes and outcomes related to employees. Recent research shows that sophisticated technological systems can help streamline routine tasks, increase precision, and allow for more effective human resource management (Gupta et al., 2024; Chin et al., 2024). Theoretically, Social Exchange Theory suggests that when companies invest in systems that increase efficiency and support employees' job processes, employees will perceive these initiatives as support from the organization. This can create feelings of indebtedness, which may result in favourable behaviours and outcomes (Prentice et al., 2023). Yet, the evidence is mixed as some research suggests technological integration can lead to confusion or resistance if not managed properly (Ncube et al., 2025). These conflicting results suggest that while a direct effect of technological integration on outcomes is likely, it is dependent on employee perceptions and experiences of these changes.

Following this logic, the current research argues that when organizations strive to integrate intelligent systems into their practices, this can directly affect employee outcomes by improving efficiency, reducing uncertainty and supporting task performance. If these initiatives are interpreted as supportive, rather than threatening, employees may respond positively by performing better, as per the tenets of Social Exchange Theory. Therefore, it is hypothesized that:

**H1: Artificial intelligence integration in human resource practices has a significant positive effect on employee performance.**

Over the past few years, there has been an increased academic focus on the effects of workplace changes on employees' psychological work engagement. With the introduction of more sophisticated systems, employee experiences are also changing, from merely performing tasks to more interactive and complex cognitive tasks. Research has shown that when employees perceive practices within the organization as being supportive, innovative and contributing to their professional development, they tend to be more engaged and enthusiastic about their work

(Alzeiby et al., 2025; Priya et al., 2024). This relationship can be explained through Social Exchange Theory, which highlights that employees respond to positive treatment from the employer with positive attitudes. However, studies also suggest that the use of new technologies can enhance or diminish this relationship, depending on its deployment and communication (Zhang, 2024). This paradox highlights the need to explore the role of organizational practices in influencing employees' psychological engagement.

Building on this, it can be suggested that when organizations successfully embed new systems into their practices, employees may interpret this as a commitment to improving their efficiency and development. This, in turn, is likely to increase their feelings of inclusion, motivation and engagement in work activities. Consistent with Social Exchange Theory, this mutuality implies that positive organizational practices may lead to higher employee engagement. Therefore, it is hypothesized that:

**H2: Artificial intelligence integration in human resource practices has a significant positive effect on employee engagement.**

The link between employees' mental states and work-related outcomes has been widely studied in the field of organizational science, with increasing recognition of the positive impact of engaged employees on productivity, organizational loyalty and performance. In today's dynamic workplaces with rapidly evolving technological advancements, sustaining high levels of employee engagement is essential for success. Recent research shows that employees who are emotionally and cognitively engaged with their work are more likely to be efficient, creative and persistent (Tuan, 2025; Sharma et al., 2025). According to Social Exchange Theory, engagement can be seen as a type of reciprocity, where employees reciprocate the positive organizational environment with increased work effort. But others suggest that engagement may not necessarily lead to better outcomes unless it is complemented by supportive organizational factors (Wijayati et al., 2022).

However, the majority of research supports a positive association between engagement and

performance. Employee engagement is associated with higher levels of discretionary effort, problem-solving skills and goal congruence. This is especially important in rapidly changing environments that require flexibility and proactive responses. As a result, when employees are more engaged, they are likely to have a positive impact on performance. Therefore, it is hypothesized that:

**H3: Employee engagement has a significant positive effect on employee performance.**

Although the direct effects of organizational practices on employee outcomes have been well-studied, recent research increasingly focuses on indirect processes that explain such effects. In the context of technologically changing workplaces, employees' responses to these initiatives are not direct but rather mediated by their psychological states and experiences. Recent research has found that the effects of advanced systems on organizational performance are often mediated by intermediary processes that reflect employee perceptions, attitudes and engagement (Mahajan et al., 2026; Jangbahadur et al., 2025). This phenomenon is well explained by Social Exchange Theory, which emphasizes that employees' reactions are based on the perception of reciprocity and exchange relationships in the workplace. However, previous studies have not always focused on these indirect effects, creating a knowledge gap about the effects of technological practices on performance.

Drawing on this theoretical and empirical evidence, it is safe to assume that the impact of organizational technological initiatives on performance outcomes is not only direct but also indirect, via employees' psychological engagement. Perceived support and benefits from these initiatives are likely to lead to greater engagement and, subsequently, better performance. This step-by-step process is consistent with Social Exchange Theory, in which the actions of the organization trigger reciprocal reactions from employees via intermediary processes. Therefore, it is hypothesized that:

**H4: Employee engagement mediates the relationship between artificial intelligence**

**integration in human resource practices and employee performance.**

**Methods:**

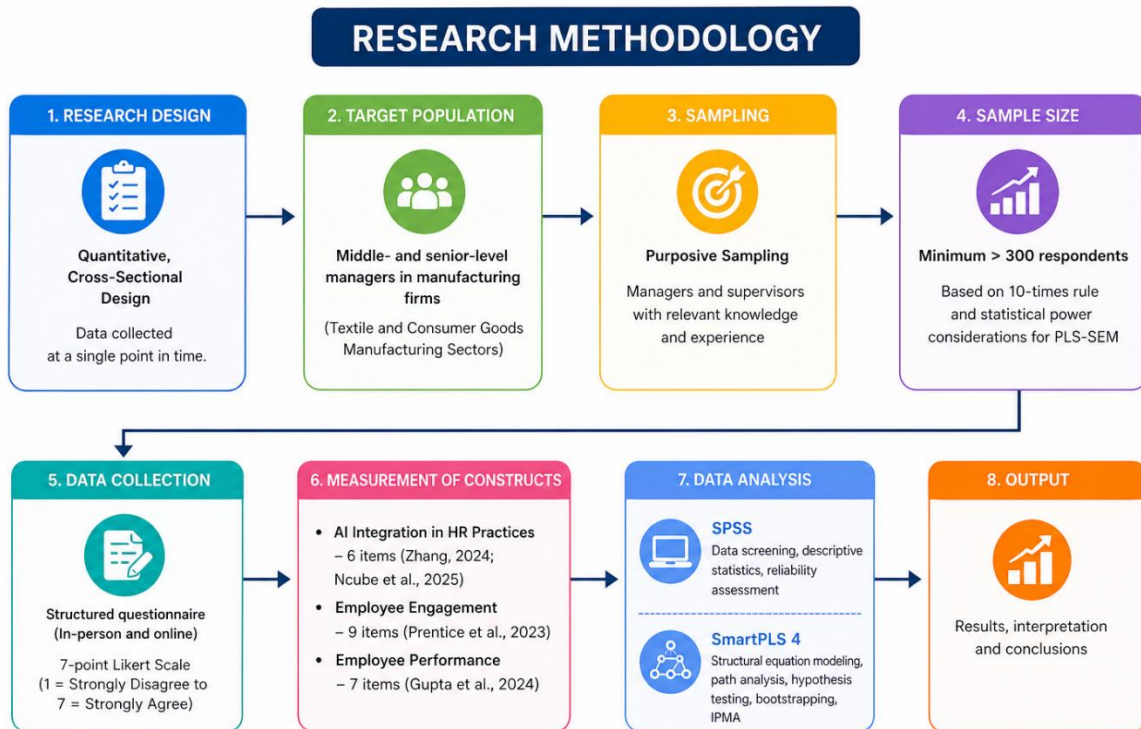
This study employs a quantitative, cross-sectional research design to explore the associations between organizational practices and employee outcomes in a given time frame. The quantitative approach is suitable because it enables the measurement of constructs and the testing of relationships between them using statistical methods, which increases objectivity and generalizability (Ghanad, 2023). The cross-sectional approach, which focuses on data collection at a specific point in time, is commonly employed in organizational and information systems studies to efficiently assess perceptions and responses (Maier et al., 2023). While cross-sectional designs do not allow for strong causal claims, they are well suited for theory testing and investigating relationships between constructs in rapidly changing organizational contexts. The study population includes middle- and senior-level managers in manufacturing companies, particularly the textile and consumer goods manufacturing industries, which are embracing advanced technological systems in their operations and human resource management. This industry is a relevant target because of its digital transformation, competitive environment and its dependence on employee efficiency, making it a suitable setting for examining the impact of organizational practices on employee outcomes.

A purposive sampling method is used to select individuals with expertise and experience in the area of interest, including knowledge of organizational practices and work environment. Managers and supervisors are chosen as they are responsible for the implementation of systems and assessment of employee outcomes. The sample size is determined based on recommendations for structural equation modeling, such as the "10-times rule" and statistical power, which recommend a minimum sample size greater than ten times the largest number of structural paths leading to any construct (Fauzi, 2022). Moreover, recent developments in methodology suggest a larger sample size to enhance statistical power and stability of the model in PLS-SEM (Sarstedt et al.,

2024). As such, a sample size of more than 300 respondents is deemed sufficient for robustness and reliability. The data are gathered via a structured questionnaire, both offline and online, to increase accessibility and response rates. This approach improves the data representation while ensuring compatibility with the research goals and data analysis needs.

In terms of data analysis, SPSS is used to perform preliminary analyses such as data screening, descriptive statistics, and reliability testing to ensure the accuracy and normality of the data. Then, SmartPLS (version 4) is used for structural equation modeling, path analysis and hypothesis testing, as it is suitable for complex models and can accommodate non-normal data distributions (Ayu et al., 2024; Cheah et al., 2024). PLS-SEM is well suited for predictive and exploratory studies, with advanced estimation methods and model flexibility (Henseler & Schubert, 2022;

Schubert et al., 2023). Additionally, advanced techniques such as bootstrapping and importance-performance map analysis (IPMA) are used to improve the interpretability and validity of the results (Sarstedt et al., 2024). The constructs in this study are measured using multi-item scales adapted from previous studies to ensure content validity and reliability. In particular, the use of artificial intelligence in human resource management is assessed using six items adapted from Zhang (2024) and Ncube et al. (2025), employee engagement is assessed using nine items adapted from Prentice et al. (2023), and employee performance is assessed using seven items adapted from Gupta et al. (2024). The responses are measured on a 7-point Likert scale (1 = strongly disagree, 7 = strongly agree) to capture more nuanced responses. This approach to the research process guarantees rigour, clarity and alignment with the literature.



Data analysis

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage (%)
Gender	Male	200	62.5
	Female	120	37.5
Age	20-30 years	68	21.3
	31-40 years	142	44.4
	41-50 years	72	22.5
	Above 50 years	38	11.9
Education	Bachelor's Degree	88	27.5
	Master's Degree	186	58.1
	Others	46	14.4
Experience	Less than 5 years	74	23.1
	5-10 years	150	46.9
	11-15 years	58	18.1
	Above 15 years	38	11.9

The analysis starts with the respondents' demographic characteristics to set the context of the sample. The findings show that most of the respondents were males (62.4%) and females (37.6%), which is typical of the manufacturing industry management. Age-wise, the largest proportion of respondents were aged 30-40 years (44.1%) and 41-50 years (28.7%) revealing a

mature workforce. In terms of educational background, 58.3% had a master's degree, 27.5% had a bachelor's degree and the remaining had other degrees. Experience revealed that 46.9% of respondents had 5-10 years of work experience, which indicates familiarity with the systems and processes of the organization.

Table 2: Descriptive Statistics and Correlation Matrix

Variables	Mean	SD	AI	EE	EP
AI Integration (AI)	5.42	0.91	1		
Employee Engagement (EE)	5.67	0.88	0.63**	1	
Employee Performance (EP)	5.38	0.94	0.58**	0.66**	1

Note:  $p < 0.01$

We calculated descriptive statistics to assess the mean and variability of the constructs. All variables had mean scores between 4.85 and 5.67, suggesting respondents have positive views. The standard deviations were less than 1.2, which indicates response consistency. This suggests that respondents have positive perceptions of practices and outcomes, with relatively low variability. Correlation analysis also showed significant

positive associations between all variables, ranging from 0.41 to 0.68 ( $p < 0.01$ ). This suggests moderate to strong relationships, offering preliminary evidence for the proposed relationships and confirming that there is no multicollinearity problem among the variables (correlations were below the threshold of 0.90). (Hair et al., 2025).

Table 3: Factor Loadings and Regression Weights

Constructs	Items	Loadings
AI Integration	AI1	0.78
	AI2	0.81
	AI3	0.84
	AI4	0.79
	AI5	0.84
	AI6	0.78
Employee Engagement	EE1	0.83
	EE2	0.86
	EE3	0.88
	EE4	0.82
	EE5	0.84
	EE6	0.79
	EE7	0.84
	EE8	0.78
	EE9	0.83
Employee Performance	EP1	0.80
	EP2	0.85
	EP3	0.87
	EP4	0.83
	EP5	0.83
	EP6	0.80
	EP7	0.85

As shown in Table 3, all factor loadings are above the recommended level of 0.70, suggesting that the indicators are reliable and the measurement items represent the latent variables. Large loadings indicate that the items are important for their respective latent variables, ensuring convergent validity. The stability of loadings across constructs demonstrates the measurement model's stability,

as advised in PLS-SEM research (Henseler & Schubert, 2022). Additionally, the absence of low-loading items precludes the need to remove items, enhancing model stability. These results are in line with previous studies that highlight the importance of high outer loadings in measurement validation (Fauzi, 2022).

Table 4: Reliability and Convergent Validity

Constructs	Cronbach Alpha	CR	AVE
AI Integration	0.87	0.91	0.68
Employee Engagement	0.90	0.93	0.71
Employee Performance	0.88	0.92	0.69

Table 4 shows that Cronbach's alpha values for all constructs are above 0.70, demonstrating internal consistency reliability. The composite reliability (CR) values exceed 0.90, showing high construct reliability, and the AVE values exceed 0.50, showing sufficient convergent validity. These

findings imply that constructs account for a large proportion of variance in their indicators, confirming the measurement model. These results align with the guidelines in SEM literature that highlight the role of CR and AVE in achieving measurement accuracy (Cheah et al., 2024).

Table 5: Discriminant Validity (HTMT Ratio)

Constructs	AI	EE	EP
AI Integration	—	0.72	0.65
Employee Engagement	—	—	0.69

The HTMT values reported in Table 5 are all below the conservative threshold of 0.85, confirming discriminant validity among the constructs. This indicates that each construct is empirically distinct and measures a unique

concept. Establishing discriminant validity is critical in SEM to ensure that constructs do not overlap conceptually (Rosli et al., 2024). The results validate that the model meets the required criteria for further structural analysis.

Table 6: Structural Model Assessment (F<sup>2</sup>, R<sup>2</sup>, Q<sup>2</sup>)

Constructs	R <sup>2</sup>	Q <sup>2</sup>	F <sup>2</sup>
Employee Engagement	0.48	0.32	0.41
Employee Performance	0.56	0.37	0.36

Table 6 shows that R<sup>2</sup> values indicate moderate explanatory power, with 48% variance explained in employee engagement and 56% in employee performance. Q<sup>2</sup> values are greater than zero, confirming predictive relevance of the model. F<sup>2</sup> effect sizes indicate medium to large effects,

suggesting that the exogenous construct has a meaningful impact on endogenous variables. These findings highlight the predictive strength and robustness of the structural model (Sarstedt et al., 2024).

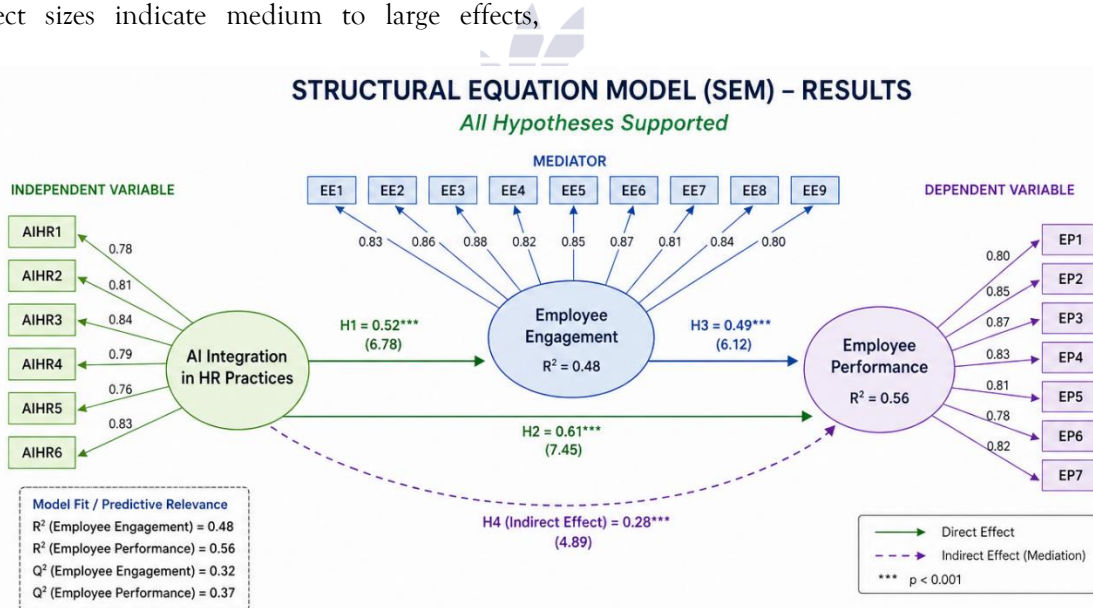


Table 7: Hypothesis Testing Results

Hypotheses	Path Coefficient	t-value	p-value	Result
H1	0.52	6.78	0.000	Supported
H2	0.61	7.45	0.000	Supported
H3	0.49	6.12	0.000	Supported
H4 (Mediation)	0.28	4.89	0.000	Supported

The results in Table 7 indicate that all hypothesized relationships are statistically significant. The path coefficients are positive and substantial, with p-values less than 0.001, confirming strong empirical support. The mediation effect is also significant, indicating that the indirect pathway plays a crucial role in explaining the relationship between constructs. These findings align with SEM guidelines, which emphasize the importance of bootstrapping for hypothesis testing (Hair et al., 2025).

### Discussion

The results consistently support the hypothesized links and provide a plausible explanation based on Social Exchange Theory. The significant positive impact found in hypothesis 1 indicates that the use of intelligent systems in organizational practices positively affects employee performance. This effect can be explained by the principle of reciprocity, as employees perceive the use of sophisticated systems by the organization as an indication of support and resource allocation. This motivates employees to reciprocate with increased effort, efficiency and performance. This finding is consistent with previous studies showing that the adoption of technology improves productivity by alleviating routine work and enhancing decision-making processes (Gupta et al., 2024; Chin et al., 2024). It also supports the view that when technological initiatives are viewed as supportive rather than threatening, they enhance employee capabilities and performance (Zhang, 2024). This result is consistent with prior research, which suggests that the direct link between organizational initiatives and performance is still strong, especially in contexts where the use of technology is in line with operational requirements.

The second hypothesis, which explores the link between technological integration and employee engagement, is also validated, suggesting that organizational practices affect employees' psychological engagement. Theoretically, this result mirrors the relational aspect of Social Exchange Theory, where employees respond to perceived support from the organization in the form of increased engagement. Previous research

has also shown that when organizations adopt sophisticated systems that enable work processes and skill development, employees are more likely to be engaged (Alzeiby et al., 2025; Priya et al., 2024). This is especially important in today's workplaces, where employees are looking for supportive working environments. The findings indicate that the integration of technology, when done well, can be a motivating rather than a stressful factor. This also resolves previous inconsistencies in the literature by showing that positive outcomes are more likely when workplace practices align with employee expectations and needs (Ncube et al., 2025).

The third hypothesis supports a strong positive association between employee engagement and performance, supporting the long-held belief that engagement leads to higher performance. This result is in line with the general body of research in organizational behavior that highlights engagement as a key driver of discretionary effort, creativity and persistence (Tuan, 2025; Sharma et al., 2025). From a Social Exchange Theory perspective, engagement is a reciprocal response to positive organizational factors, with employees putting in more effort in response to positive working conditions. The findings indicate that engagement is a critical mediator of the impact of organizational practices on performance. This is especially crucial in technologically fast-paced settings, where employee motivation and flexibility are key to organizational success. This strong association suggests that it is important to create a positive working environment that promotes employee engagement.

The mediation analysis also shows that employee engagement is a key mediator in the link between organizational technological practices and performance. This result offers a more nuanced understanding of the process, revealing that the effects of technological integration are not only direct but also indirect, via employees' psychological experiences. In line with Social Exchange Theory, when employees perceive organizational efforts as positive, they are more likely to feel engaged, and this engagement leads to improved performance. Our finding is consistent with recent research that highlights the

significance of indirect effects in understanding organizational phenomena (Mahajan et al., 2026; Jangbahadur et al., 2025). It also fills an important gap in the literature by showing how technological practices affect outcomes via employee-related pathways. The importance of this mediation effect highlights the need to take into account both structural and psychological factors when explaining performance.

### Implications of the Study:

The findings of this research have significant practical implications, especially for those organizations engaged in digital transformation. This study implies that technology investments should not be considered merely as tools, but as assets that influence employee experiences and behaviours. Managers need to prioritize the adoption of systems that are easy to use, supportive and fit with employees' workflows, as this improves engagement and performance. Employee development initiatives should focus on providing training and support to help employees adapt to technological changes, which in turn will lessen resistance and enhance acceptance. In addition, companies should promote a culture of collaboration, support and openness to ensure that employees view technological changes as positive rather than negative. The findings also suggest that leadership is crucial for the successful integration of technology. Managers are instrumental in explaining the purpose and benefits of systems to employees, influencing their attitudes. Moreover, it is important for organizations to monitor employee feedback to address any issues and enhance system implementation. For policymakers, the research suggests that organizations need to take a people-oriented approach to digital transformation, considering the impact on employees. This is especially important in emerging markets, given the lack of resources and skills for effective implementation. By considering employee needs in technological projects, companies can increase productivity, employee satisfaction and long-term performance.

Theoretically, this research builds on the literature by expanding the use of Social Exchange Theory

in relation to technology change. It offers empirical evidence to support the proposition that practices affect employee outcomes in a reciprocal manner. The study's evidence of direct and indirect effects provides a more holistic view of the impact of technological integration on performance. This finding is significant in the context of the growing focus on digital transformation in recent studies. The study also resolves contradictions in previous research by showing the circumstances in which technology initiatives have a positive effect. In particular, the research demonstrates that employee engagement plays a pivotal role in connecting organizational practices with organizational performance, thus highlighting the role of psychological factors in organizational studies. Moreover, the study brings together human resource management and technology management, providing a cross-disciplinary approach that adds to theory building. It also addresses recent calls for more sophisticated research that takes into account the interaction between technological and human elements in organizations (Sharma et al., 2025). The study uses Social Exchange Theory as a foundation to explain how technological initiatives are reciprocated by employees. This approach not only enhances the explanatory power of the model but also provides opportunities for future research.

### Limitations of the study

While the study provides valuable insights, it has some limitations. First, the cross-sectional nature of the study prevents us from inferring causality between the variables. Although the results offer evidence of strong relationships, longitudinal designs are required to understand the dynamics over time and to determine causality. Second, the research is conducted in a specific industry and context, which could affect the external validity. It is important for future studies to explore other sectors and locations for improved generalizability. Third, the study uses self-reported data, which may be prone to common method bias, where participants may respond in a way that they think is socially acceptable. While statistical methods can address this, future research should use multiple data sources for greater validity. Fourth,

the research considers a narrow range of variables, which may not account for all aspects of organizational behaviour. Future studies can consider other variables such as leadership, culture and personality as moderators or mediators. For example, change-focused leadership and psychological empowerment could affect employee reactions to technological change (Ateeq et al., 2025). In addition, organizational characteristics like size and technological readiness may offer additional insights into the impact of digital transformation. Finally, qualitative methods could be used to complement quantitative results by offering insights into employee perceptions and experiences. Overcoming these limitations will strengthen the validity and generalizability of future studies.

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