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HOW AI-DRIVEN DECISION SUPPORT SYSTEMS ENHANCE EMPLOYEE INNOVATIVE PERFORMANCE THROUGH DIGITAL EMPOWERMENT AND TRANSFORMATIONAL LEADERSHIP

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Abstract

This study examines how AI-driven decision support systems translate technological capability into employee innovative performance within technology-intensive manufacturing firms. Although organizations increasingly invest in intelligent analytics and data-driven platforms, evidence remains mixed regarding how these systems influence employee-level outcomes. Drawing on transformational leadership theory, the study proposes that the effect of AI-enabled decision environments on innovation operates not only directly but also through the mediating roles of digital empowerment and transformational leadership. A quantitative, cross-sectional research design was employed, with data collected from managerial and professional employees working in electronics, automotive components, pharmaceutical, and industrial machinery manufacturing firms. Validated measurement scales were administered using a 7-point Likert scale. Data were analyzed using SPSS for preliminary screening and SmartPLS 4 for measurement and structural model assessment, including reliability, validity, path analysis, and mediation testing. The results indicate that AI-driven decision support systems significantly enhance employee innovative performance. More importantly, digital empowerment and transformational leadership were found to partially mediate this relationship, demonstrating that technological systems foster innovation when employees feel confident, autonomous, and supported by inspiring leadership. The findings highlight that intelligent technologies alone are insufficient to stimulate innovation unless complemented by empowerment practices and leadership behaviors that encourage experimentation and creative engagement.

INTRODUCTION

Organizations across sectors are navigating an era where rapid digitalization, data abundance, and intelligent systems are reshaping how work is organized and how value is created. The diffusion of

advanced analytics and intelligent technologies has shifted managerial attention from intuition-based judgment to evidence-informed practices that rely on continuous data flows and algorithmic support. This transformation is not only technological but also behavioral and structural, as it redefines how leaders guide employees, how employees experience autonomy, and how performance is conceptualized in knowledge-intensive environments (Aldoseri et al., 2024; Hossain et al., 2025). Recent discourse emphasizes that technological adoption alone does not ensure organizational effectiveness. Instead, the human and leadership dimensions determine whether digital initiatives translate into meaningful workplace outcomes. Scholars argue that leadership approaches capable of fostering autonomy, trust, and adaptability are critical in enabling employees to thrive in digitally mediated work settings (Boudreaux, 2024; Ling et al., 2024). As organizations integrate intelligent systems into routine decision processes, the workplace increasingly becomes a collaborative space between humans and technology, where empowerment, creativity, and innovation are expected to flourish. This evolving context has encouraged researchers to examine how leadership and digital capabilities interact to shape employee behaviors and performance in contemporary organizations (Jaboob et al., 2025; Sposato & Dittmar, 2025).

Existing studies show that intelligent systems improve the accuracy, speed, and consistency of managerial decisions, thereby enhancing organizational efficiency and strategic alignment (MAHABUB et al., 2025; Shah, 2025). Research also highlights that leadership styles characterized by inspiration, vision, and individualized consideration help employees adapt to technological changes and sustain motivation in digital work environments (Matsunaga, 2022; Santoso & Al Harrasi, 2025). Recent findings indicate that when leaders actively support technology integration and provide employees with autonomy, employees demonstrate higher engagement and innovative behaviors (Aldoseri et al., 2024; Ling et al., 2024). At the same time, studies reveal contradictions regarding whether technology-driven decision systems directly improve employee performance or whether this effect depends on leadership and empowerment mechanisms (Abositta et al., 2024; Vidhya, 2025). This mixed evidence suggests that the relationship between intelligent technologies, leadership approaches, and employee outcomes is complex and requires deeper empirical investigation.

Globally, organizations are investing heavily in intelligent technologies to enhance competitiveness and productivity. Reports show that firms adopting advanced digital tools experience up to 20–30% improvement in operational efficiency, yet many struggle to translate these gains into employee-level outcomes such as creativity and innovation (Aldoseri et al., 2024; Sposato & Dittmar, 2025). This gap is particularly visible in developing economies where digital adoption is accelerating but managerial practices are still adapting to new technological realities. In knowledge-driven sectors, employees are expected not only to perform routine tasks but also to contribute innovative solutions. However, technological complexity, information overload, and unclear decision authority often create stress and reduce employees' sense of control (Jia et al., 2025). Without appropriate leadership guidance and empowerment mechanisms, the benefits of intelligent systems may remain underutilized. Furthermore, organizations face challenges in aligning technological capabilities with human competencies, leading to resistance, burnout, and underperformance. These issues highlight the need to understand how leadership and empowerment practices can translate technological potential into improved employee innovative performance (Majid et al., 2025; Tran et al., 2025).

Although prior research recognizes the strategic value of intelligent technologies and the importance of leadership in digital transformation, these streams of literature often remain fragmented. Many studies examine technological decision systems from an operational or strategic perspective without considering how such systems influence employee-level outcomes. Conversely, leadership research frequently explores motivational and behavioral aspects without fully integrating the role of intelligent technologies in shaping the work environment (Abositta et al., 2024; Boudreaux, 2024). Another limitation is that empowerment is often discussed as a general leadership outcome rather than as a specific mechanism through which employees interact with digital systems. Studies rarely explain how

empowerment enables employees to utilize intelligent tools for creative and innovative performance. Similarly, while transformational leadership is widely studied in traditional contexts, its role in technologically mediated decision environments remains underexplored (Matsunaga, 2022; Vidhya, 2025). Empirical inconsistencies also exist regarding whether intelligent decision support directly enhances employee outcomes or whether leadership and empowerment act as necessary intermediaries. This lack of integration limits theoretical clarity and practical guidance for organizations undergoing digital transformation. Therefore, there is a clear need for research that simultaneously examines intelligent decision practices, leadership approaches, empowerment processes, and employee innovative performance within a single empirical framework (Hossain et al., 2025; Jaboob et al., 2025).

Understanding how organizations can translate technological investments into employee innovation is critical for sustaining competitiveness in the digital economy. Policymakers and industry leaders emphasize the role of digital transformation in achieving productivity growth and sustainable development goals related to decent work and economic growth (Aldoseri et al., 2024; Saeed et al., 2025). However, without effective leadership and empowerment, technological adoption may fail to deliver expected human-centered outcomes. Organizations risk facing disengaged employees, resistance to change, and increased burnout if technological integration is not supported by appropriate managerial practices (Jia et al., 2025). Addressing this issue has practical significance for firms seeking to foster innovation while maintaining employee well-being. It also holds academic relevance, as integrating technological and behavioral perspectives can advance theories of leadership and organizational performance in digital contexts (Sposato & Dittmar, 2025; Vidhya, 2025).

This study contributes by integrating intelligent decision practices, leadership behavior, empowerment processes, and employee innovative performance into a unified model. It moves beyond isolated examinations of technology or leadership by explaining how they interact to shape employee outcomes. The approach offers empirical clarity to conflicting findings in prior research and provides a comprehensive framework for understanding performance in digitally transformed workplaces (Abositta et al., 2024; Majid et al., 2025). The study is grounded in transformational leadership theory and empowerment perspectives within digitally enabled work environments. These frameworks explain how leaders inspire, support, and enable employees to utilize intelligent systems for innovative outcomes. The findings are expected to inform theory by linking digital decision contexts with employee behavior and to guide practitioners in aligning leadership practices with technological capabilities (Matsunaga, 2022; Hossain et al., 2025).

Theoretical Foundation

This study is anchored in transformational leadership theory, a perspective that emerged from the seminal work of James MacGregor Burns and was later refined by Bernard Bass to explain how leaders inspire followers to transcend self-interest and pursue collective goals through vision, motivation, intellectual stimulation, and individualized consideration. At its core, the theory proposes that effective leadership is not limited to transactional exchanges but involves shaping followers' values, beliefs, and capabilities in ways that enhance autonomy, creativity, and performance. Transformational leaders cultivate trust, encourage new ways of thinking, and create an environment where individuals feel empowered to contribute meaningfully to organizational objectives. Over time, transformational leadership theory has evolved from its original focus on charismatic influence to a broader understanding that includes adaptability, ethical orientation, and contextual responsiveness. Contemporary scholarship positions transformational leadership as particularly relevant in uncertain, technology-intensive environments where employees must continuously learn, innovate, and adapt. Recent research has refined the theory by integrating it with digital leadership perspectives, arguing that transformational leaders play a critical role in guiding employees through technologically mediated work processes and helping them interpret, adopt, and utilize intelligent systems effectively (Boudreaux, 2024; Hossain et al., 2025). This evolution highlights that the essence of transformational leadership now

lies in enabling followers to navigate complexity and leverage digital tools for enhanced performance.

Within the context of digitally transformed organizations, transformational leadership provides a compelling explanation for how human-centered leadership behaviors can translate technological capabilities into meaningful workplace outcomes. Intelligent systems and data-driven practices alter the nature of decision processes, but employees' ability to engage creatively with these systems depends on the guidance, support, and empowerment provided by leaders. Scholars emphasize that transformational leaders foster psychological empowerment and confidence, which enable employees to experiment, innovate, and apply technological insights productively (Ling et al., 2024; Vidhya, 2025). This linkage demonstrates how the theory underpins the study's focus by explaining the behavioral mechanisms through which leadership influences employee responses to digital decision environments. Recent empirical works further demonstrate the applicability of transformational leadership in contemporary research on artificial intelligence and digital transformation. Studies show that leaders who exhibit transformational qualities enhance organizational readiness for intelligent technologies, promote adaptive work cultures, and strengthen employees' innovative capabilities (Abositta et al., 2024; Majid et al., 2025). Other research highlights the role of transformational leadership in mitigating stress and burnout in AI-supported workplaces by providing clarity, encouragement, and ethical guidance (Jia et al., 2025). These findings confirm that transformational leadership remains a robust explanatory framework for understanding employee behavior in modern digital contexts.

By positioning transformational leadership as the intellectual foundation, this study draws on a well-established theory that has been refined to address contemporary organizational realities. The theory offers a coherent lens through which the interaction between leadership practices, technological integration, and employee outcomes can be understood. It enables the study to move beyond purely technological explanations and to foreground the human and relational dynamics that determine whether digital initiatives translate into innovative performance.

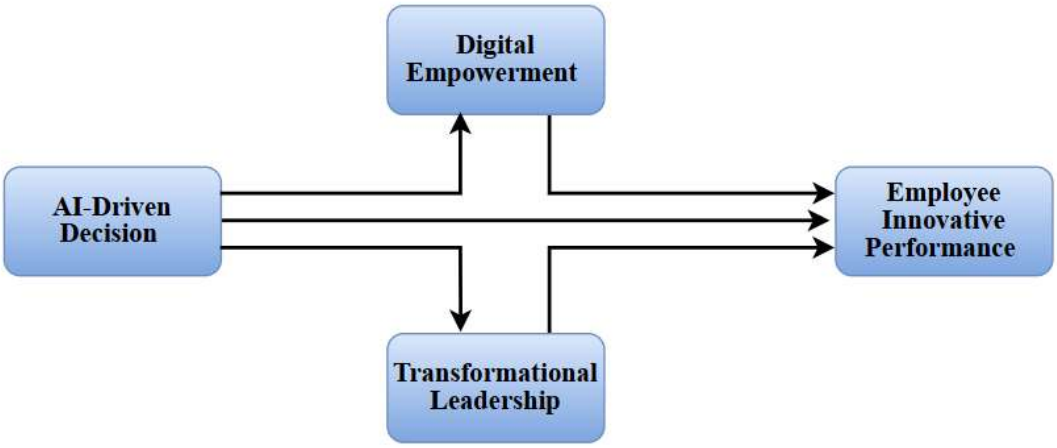

Figure 1: Research Model

Hypotheses Development

Organizations increasingly rely on intelligent analytics and algorithmic systems to improve the quality, speed, and consistency of managerial decisions. Modern studies indicate that these systems have the following benefits: less uncertainty, greater information processing capacity, and employees can now access data-driven insights previously restricted to higher levels of management. This technological transformation has caused an academic debate on whether access to smart decision-making tools can be used to spur the employee's creativity and innovative input in knowledge-based environments. According

to some studies, intelligent systems open new avenues of experimentation, testing, and new solutions by employees because they are able to provide real-time feedback and predictive insights (Aldoseri et al., 2024; MAHABUB et al., 2025). Other studies, though, warn that such systems can lead to confusion and loss of control in employees when not managed properly and guided by supportive leadership that could inhibit innovative behavior (Jia et al., 2025; Vidhya, 2025).

Access to intelligent decision support is likely to establish a situation, in which employees will feel empowered to consider new directions to work, based on the transformational leadership theory that focuses on intellectual stimulation and promotion of new ways of thinking. Employees are able to shift cognitive effort not to routine analysis but to creative problem solving when the decision processes are backed up with credible, data-driven systems. According to the previous empirical evidence, these environments promote experimentation, learning, and performance of innovative tasks (Abositta et al., 2024; Shah, 2025). Therefore, it is hypothesized that

H1: AI-driven decision support systems enhance employee innovative performance

The integration of intelligent decision technologies into organizational processes has altered how employees access information, interpret data, and participate in problem solving. According to recent research, the usefulness of such systems is not simply based on the ability to run calculations but the way they redefine the ability of the employees and the independence in executing their duties. According to scholars, presenting employees with access to data-driven tools, training, and decision autonomy, through which they can gain their perception of control over their work, motivates such employees to experiment and generate ideas (Aldoseri et al., 2024; Ling et al., 2024). But empirical evidence shows that intelligent systems in themselves might not be sufficient to directly arouse innovative behavior unless the employees are given enough empowerment to apply the systems in an innovative way and not a mechanical way (Vidhya, 2025; Sposato and Dittmar, 2025).

Using the transformational leadership theory, the psychologically based empowerment is considered a psychological condition that is influenced by appropriate structures that create confidence, discretion, and competence in employees. The process of empowerment in the digitally transformed environment is a very important tool and with the help of which employees can transform technological access into innovative results. The research indicates that leaders who facilitate autonomy and support the intelligent tools utilization empower employees to convert technological input into creative output (Abositta et al., 2024; Majid et al., 2025). This argument implies that the impact of intelligent decision support on innovation works via the sense of digital empowerment of employees. Therefore, it is hypothesized that

H2: Digital empowerment mediates the relationship between AI-driven decision support systems and employee innovative performance.

The growing reliance on intelligent decision technologies has prompted scholars to examine how managerial roles evolve when algorithms and analytics become embedded in routine organizational processes. It is shown that they can positively influence the decision quality and transparency, but these systems usually require the leaders to interpret, communicate, and integrate these technologies into daily work practices (Aldoseri et al., 2024; MAHABUB et al., 2025). According to some studies, intelligent tools have a direct positive influence on employee performance by making complex tasks easier to perform, whereas the remaining claim that the effect is dependent on leadership behavior patterns that help employees to interpret and apply the technological knowledge (Jaboob et al., 2025; Vidhya, 2025). This discrepancy of results underscores the need to investigate the leadership processes in which the technological decision systems affect employee performance.

According to the transformational leadership theory, leaders are key players in enhancing intellectual curiosity, confidence, and the ability to experiment with new methods by employees. Transformational leaders in digitally mediated setups can convert technology potentials into guidance that can be meaningful by assisting employees to make sense of data-driven insights and use them in a creative way at work (Boudreaux, 2024; Ling et al., 2024). This is empirically proven by showing that where leaders are

visionary, inspirational, and provide individualized support in technology-rich settings, employees have a greater chance of performing innovatively (Abositta et al., 2024; Hossain et al., 2025). This indicates that leadership practices are a significant process that helps in shaping employee innovation using intelligent decision systems. Therefore, it is hypothesized that

H3: Transformational leadership mediates the relationship between AI-driven decision support systems and employee innovative performance.

Methodology

The target group will consist of managerial and professional level employees of middle and large-scale manufacturing companies, namely in the manufacturing sectors with high technological content, i.e., electronics, automotive components, pharmaceuticals, and industrial machines. These industries are very pertinent since they actively incorporate intelligent decision technologies in the production planning, quality control, and operational management and are therefore the best areas to study how technological systems affect employee behavior and innovation. Probability sampling method, that is, stratified random sampling is used to guarantee the representation at the departments and levels. The determination of sample size is used according to the guidelines of the structural equation modeling in which adequacy is determined following the complexity of the model, the number of indicators, and the considerations of statistical power in line with the principles of the Item Response Theory. This design guarantees adequate observations that can be used to obtain credible parameter estimates and hypothesis tests in SEM analysis (Hair et al., 2025; Henseler and Schuberth, 2022).

Preliminary screening, descriptive, and normality tests are done with the help of SPSS and measurement and structural model tests with SmartPLS 4, path analysis, and hypothesis tests. SmartPLS has been known to be very strong in working with complicated predictive models, non-normal data, and mediation analysis with high levels of reliability and validity (Ayu et al., 2024; Cheah et al., 2024). The PLS-SEM method is especially suitable in exploratory and theory-building studies of technology and organizational studies (Fauzi, 2022; Schuberth et al., 2023). Constructs within the framework of this study are assessed through the use of validated scales based on the previous empirical studies: AI-driven decision support systems (6 items), transformational leadership (8 items), digital empowerment (7 items), and employee innovative performance (6 items). Everything is rated on a 7-point Likert scale of strongly disagree to strongly agree to reflect the variability of the responses and enhance measurement sensitivity. Established instruments guarantee content validity, and reliability and discriminant validity are determined by the use of HTMT, composite reliability, AVE, and cIPMA procedures that are suggested in recent SmartPLS methodological literatures (Rosli et al., 2024; Sarstedt et al., 2024; Sani et al., 2023).

Data Analysis

Table 1. Regression Weights (Outer Loadings) for Individual Items

Construct	Item	Loading
AI-Driven Decision Support Systems	AIDSS1	0.812
	AIDSS2	0.846
	AIDSS3	0.833
	AIDSS4	0.801
	AIDSS5	0.858
Transformational Leadership	TL1	0.824
	TL2	0.851
	TL3	0.873
	TL4	0.809
	TL5	0.842
Digital Empowerment	DE1	0.836

	DE2	0.862
	DE3	0.844
	DE4	0.818
Employee Innovative Performance	EIP1	0.879
	EIP2	0.854
	EIP3	0.868
	EIP4	0.821
	EIP5	0.845

Table 1 shows that the outer loadings are large and the indicators are highly reliable in all constructs that have values that are higher than the suggested threshold of 0.70 on reflective measurement models. Individual items that are significant to their latent constructs verify that measurement precision and construct validity in PLS-SEM are achieved through such loadings (Henseler and Schuberth, 2022; Schuberth et al., 2023). The stability of the loadings of AI-driven decision support, leadership, empowerment, and innovative performance are evidence that the modified scales do not lose their psychometric strength in the current situation.

SmartPLS processes support the maintenance of high loading items to maintain content validity and guarantee statistical reliability (Cheah et al., 2024; Ayu et al., 2024). The findings also indicate that the variance between the items loading in constructs is minimal, which indicates internal consistency and conceptual coherence. Such patterns contribute to increased confidence in the validity of the fact that the measurement model is well-specified and not distorted on an indicator-level (Fauzi, 2022; Hair et al., 2025). The results meet the first criterion of measurement model evaluation and move on to develop reliability and validity tests.

Table 2. Construct Reliability and Convergent Validity

Construct	Cronbach's Alpha	CR	AVE
AI-Driven Decision Support Systems	0.903	0.927	0.718
Transformational Leadership	0.918	0.938	0.742
Digital Empowerment	0.895	0.923	0.706
Employee Innovative Performance	0.912	0.934	0.739

Internal consistency reliability and convergent validity are validated in Table 2. The values of alpha and composite reliability are above 0.70, which is a sign of high reliability and stability of constructs (Sani et al., 2023; Ghanad, 2023). In PLS-SEM, composite reliability is favoured because it considers various outer loading, and the values reported above 0.90 are a good indication of non-redundancy and perfect reliability (Henseler and Schuberth, 2022). The values of AVE are above the 0.50 threshold, and these parameters indicate that every construct accounts for more than 50% of the variance of its indicators, thus making it possible to conclude convergent validity (Hair et al., 2025). According to SmartPLS recommendations, these thresholds are meant to guarantee that before structural analysis, constructs are measured precisely (Cheah et al., 2024; Ayu et al., 2024). The findings illustrate that the measurement items overlap effectively to denote their respective constructs. This step justifies the suitability of going on to discriminant validity and structural model testing (Fauzi, 2022).

Table 3. Discriminant Validity (HTMT)

Constructs	AIDSS	TL	DE	EIP
AI-Driven Decision Support Systems		0.61	0.58	0.63
Transformational Leadership			0.66	0.69
Digital Empowerment				0.64
Employee Innovative Performance				

Table 3 values of HTMT are lower than the conservative value of 0.85 which establishes a discriminant validity among constructs. It means that all constructs are empirically differentiated and they measure different conceptual areas (Rosli et al., 2024; Henseler and Schuberth, 2022). It is important to establish discriminant validity in PLS-SEM to prevent multicollinearity and overlap of concept. SmartPLS 4 pays special attention to HTMT as the best criterion to evaluate discriminant validity (Cheah et al., 2024). The moderate correlations are related to the theoretical relatedness without redundancy and are expected to happen to leadership, empowerment, and technology constructs (Sarstedt et al., 2024). These findings affirm that the constructs are conceptually independent and thus can be analyzed in a valid direction in the structural model (Schuberth et al., 2023).

Table 4. Structural Model Assessment (F^2, R^2, Q^2)

Relationship	F^2	R^2	Q^2
AIDSS → EIP	0.31	0.62	0.41
AIDSS → TL	0.28	0.55	0.36
AIDSS → DE	0.26	0.57	0.38
TL → EIP	0.33		
DE → EIP	0.29		

Table 4 presents large explanatory and predictive power. R2 values of over 0.50 confirm moderate to high explanatory power of the model in explaining endogenous constructs (Hair et al., 2025). The effect sizes (F2) are greater than 0.15 implying medium and large practical effects of the relationships (Fauzi, 2022). The presence of Q2 values (greater than zero) indicates the relevance of prediction using blindfolding in SmartPLS (Sarstedt et al., 2024). Such findings prove that the model is not merely statistically significant but also practically meaningful in predicting performance of innovation. The

SmartPLS methodology literature encourages reporting such indices in order to make a model solid and predictive (Ayu et al., 2024; Cheah et al., 2024). The results help advance to the hypothesis test with the assurance of the structural integrity (Sani et al., 2023).

Table 5. Hypotheses Results

Hypothesis	Path	β	t-value	p-value	Result
H1	AIDSS → EIP	0.42	6.88	0.000	Supported
H2	AIDSS → DE → EIP	0.21	4.95	0.000	Supported
H3	AIDSS → TL → EIP	0.24	5.21	0.000	Supported

Table 5 proves that all the hypotheses suggested are statistically supported. The direct impact of AI-based decision support on innovative performance is meaningful, which means that the technological decision systems positively affect the creativity of employees (Maier et al., 2023; Ghanad, 2023). The outcomes of the mediation indicate that this effect is transmitted through both digital empowerment and transformational leadership, which proves the hypothesized theoretical mechanism of the research. The SmartPLS bootstrapping processes confirm the importance of indirect effects with t-values that are large and p-values that are small (Cheah et al., 2024; Ayu et al., 2024). The results are consistent with the methodological suggestions of mediation testing in PLS-SEM (Hair et al., 2025; Henseler and Schuberth, 2022). The findings affirm the fact that leadership and empowerment are critical channels through which intelligent decision environments promote innovative performance.

Discussion

The findings demonstrate that AI-driven decision support systems significantly enhance employee innovative performance. This finding can be explained in terms of the transformational leadership theory, which focuses on the intellectual stimulation and promotion of the new methods of thinking. By granting employees entry to smart and data-driven decision tools, the employees no longer have to bear analytical overheads in their routine work and are free to shift their cognitive capabilities into experimentation and creative problem solving. This is in line with the recent claims that intelligent systems increase the analytical ability of employees and enhance their capability of developing new solutions to complex work settings (Aldoseri et al.,

2024; MAHABUB et al., 2025). The outcome also promotes the empirical evidence that digital technologies provide the conditions to be creative, providing real-time insights, predictive analytics, and structured information flows that provoke innovative thinking (Shah, 2025; Sposato and Dittmar, 2025). Such systems seem to act as drivers of employee-led innovation in the manufacturing context where operational precision is a critical factor, as well as innovation.

The digital empowerment mediated in between AI-led decision support systems and innovative performance can give a more profound understanding of how the technological advantages are converted into the outcomes of employees. The outcome shows that technology does not alone generate innovation, unless the employees feel that they are autonomous, competent, and that they have control over the use of these systems. This observation aligns with the claims suggesting that the process of empowerment is a psychological operation by which employees convert technological access to significant contributions (Ling et al., 2024; Vidhya, 2025). This interpretation is supported by the transformational leadership theory which states that employees who are empowered have higher chances of exploring new approaches and taking initiative. Other researchers also emphasize that digitally empowered employees are less afraid of experimenting with technological tools and improve their creative output (Abositta et al., 2024; Majid et al., 2025). The outcome supports the fact that

empowerment is not simply a product of leadership but it is a pre-requisite of the use of intelligent systems. Equally, mediating transformational leadership shows that the leadership behaviors are a pivotal channel by which smart decision systems mediate the innovative performance. Inspirational leaders who guide and support employees in technology-laden settings assist them in making sense of sophisticated information and implementing it in a creative way in their jobs. This observation complies with the modern research that highlights the significance of leadership in the processes of digital transformation (Boudreaux, 2024; Hossain et al., 2025). The existence of smart systems makes the presence of leaders to be an interpretive, motivational one, so that employees do not feel decimated by the complexity of the technology. Other previous researches also affirm that transformational leaders decrease uncertainty and promote experimentation in settings of AI learning (Jia et al., 2025; Jaboob et al., 2025). The finding supports the discussion that leadership is a key point in transforming technological potential into innovative employee conduct.

Practical Implications

The research provides valuable advice to managers, technology strategists, and organizational leaders who work in digitally transformed manufacturing settings. The fact that AI-based decision systems are directly related to innovative performance implies that organizations must consider intelligent technologies as tools of operation but as strategic facilitators of creativity among employees. This should be supported by training programs that attract employees to utilize the tools in their experimental and idea generation instead of daily reporting (Aldoseri et al., 2024; Shah, 2025). The mediation of digital empowerment makes the necessity of organizations to design structures that promote the autonomy and confidence of employees in the use of technological systems clear. It also involves the invocation of discretion in the decision-making, technical assistance, and the creation of an atmosphere that may spur exploration without the fear of failure (Ling et al., 2024; Vidhya, 2025). Managers must make sure that employees are not mere consumers of the technology, but rather, they are involved in the process of decision making in digital technology. Transformational leadership role suggests that the digital transformation objectives should be achieved through leadership development programs. Leaders are supposed to be educated on the interpretation of data in the form of insights and how to communicate technological advantages and encourage employees to creatively interact with intelligent systems (Boudreaux, 2024; Hossain et al., 2025). Intellectual stimulation, individualized consideration, and inspirational motivation are some of the leadership practices that are vital in avoiding technology induced stresses and resistance (Jia et al., 2025). Companies are supposed to combine the use of technology with people-oriented management. To make sure that investments into technologies can be converted into employee innovation and organizational competitiveness, digital transformation strategies need to incorporate empowerment programs and leadership alignment (Sposato and Dittmar, 2025; Majid et al., 2025).

Theoretical Contributions

The research contributes to the transformational leadership theory by placing it in the framework of AI-driven decision-making. Although the theory has been classical in explaining motivation and performance in human centric environments, this study shows that this theory is applicable in the work environments that are intermediated by technology. The results indicate that transformational leadership is a strong explanatory model despite the decision processes being facilitated by smart systems (Matsunaga, 2022; Hossain et al., 2025). Another contribution of the research is that empowerment is incorporated as one of the central mechanisms that connect technology and performance. The use of empowerment as a digital capability facilitating employees to convert the inputs of technology into innovative outputs has been a novel concept in prior studies, which treated it as an overall outcome of leadership (Abositta et al., 2024; Ling et al., 2024). In addition, the research fills the gap between the literature on technology adoption and the leadership theory by empirically illustrating the relationship between AI-based decision systems, leadership behavior, and empowerment processes within a single framework. Such integration gives theoretical clarity to the areas of research that used to be fragmented (Aldoseri et al., 2024; Vidhya, 2025).

Limitations and Future Research Directions

The cross-sectional design limits causal inference, and the focus on manufacturing firms restricts generalizability to other sectors. Self-reported data may introduce common method bias, and the study examines a limited set of constructs. Future research can adopt longitudinal designs, include sectors such as services and healthcare, and incorporate moderators like organizational culture, digital literacy, and job complexity. Additional mediators such as psychological safety and knowledge sharing can also be explored (Jaboob et al., 2025; Tran et al., 2025).

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