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DRIVING SCM AND HR TRANSFORMATION WITH AI THROUGH THE ROLE OF LEADERSHIP AND INNOVATION AS MEDIATORS

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SUMMARY

Due to the fast adoption of digital technologies and artificial intelligence (AI), the operations of enterprises, especially in the context of supply chain management (SCM) and human resource (HR) practises, are being fundamentally reorganised by allowing data-driven decision-making, automating processes, and enhancing agility to organisational changes. Although in increased interest AI-driven digital transformation is also gaining momentum, empirical data describing the organisational processes in which AI-driven tools affect SCM and HR performance have scarce information, particularly the intermediating effects of transformational leadership and innovation. To fill this gap, the current research investigates the direct and indirect impacts of digital technologies and AI on changing the SCM and HR practises, and transformational leadership and innovation are modelled as the mediating constructs. The research design was a quantitative and survey research design, and its conceptual framework was empirically proved through Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings indicate that digital technologies and AI have a powerful positive impact on SCM transformation and HR transformation, whereas transformational leadership and innovation have important mediating roles in enhancing these correlations. The findings provide value to the theory because they expand the

digital transformation and leadership views, including technological accounts of AI-driven enterprise systems, and offer practical advice to managers who need to harness the emergent technologies to achieve organisational transformation sustainability. The study was a survey design, consisting of 250 participants. Significant path coefficients were those of the relationship between AI and SCM transformation, where the path coefficient was 0.42 ($p < 0.001$). The SCM transformation explained variance (R2) was 0.72 and this represents a good fit. The approach was the Partial Least Squares Structural Equation Modelling (PLS-SEM) using the SmartPLS software.

Key words: *artificial intelligence, digital technologies, supply chain management, human resource practices, transformational leadership, innovation, PLS-SEM.*

INTRODUCTION

The accelerated development of digital technologies and artificial intelligence (AI) has appeared to be a critical source of enterprise change in electronics-based organisational ecosystems. In the context of modern business, interconnected digital environments, such as data analytics solutions, smart information systems, and AI-powered decision-support tools, are becoming more and more important in the process of promoting operational efficiency, responsiveness, and strategic flexibility. Here, the concept of digital transformation goes beyond the implementation of technologies to fundamental organisational processes, structures, and value creation technology. Human resources (HR) practices and supply chain management (SCM) are among the key functions within the enterprise that are impacted specifically by AI-driven technologies that allow for maintaining real-time visibility, predictive analytics, automation, and intelligent workforce management.

The SCM is being transformed by AIs and advanced analytics and an emergent set of digital technologies to form self-adaptive supply chains, improved demand forecasting, and resilient supply logistics, but also changing the DNA of HR by introducing smart recruitment systems, analysis of the performance, and data-driven talent management. Although the use of these technologies has risen, organisations have achieved varying degrees of success in the attainment of valuable transformation results. The previous literature implies that technology capability is not alone powerful to bring about the longer-term digital transformation, but also organisation and behavioural variables were found to be very important in technology acceptance, use, and value achievement [12]. The relevance of leadership orientation and organisational innovation ability is starting to be considered as the key factor in turning digital investments into operational and strategic advantages.

Despite the literature that has explored the subject of digital transformation, adoption of AI, and enterprise performance, there is a lack of empirical research that can enlighten us about the mechanisms whereby digital technologies and AI can affect the SCM and HR practises [17][18]. Specifically, the mediation effects of transformational leadership and organisational innovation have been poorly addressed empirically in the context of integrated research [19]. The majority of the previous research concentrates on technological factors or discusses leadership and innovation individually, thus arriving at a fragmented understanding. The current paper fills this research gap by suggesting an extensive conceptual framework to contain both direct and indirect impacts of digital technologies and AI on transforming SCM and HR with transformational leadership and innovation as mediating constructs (Figure 1).

Key Contributions

- The research is an empirical study on the effect of digital technologies and AI on the transformation of supply chain management (SCM) and human resource (HR) practices, which offers insight into the explicit and indirect effects of digital technologies on organizational change.
- The study presents a new conceptual model, which integrates AI and digital enterprise viewpoints and is empirically proven to describe the mediating value of transformational leadership and organizational innovation in the transformation driven by AI.
- The study also assesses the efficacy of the organization transformation mediated by AI by measuring the effectiveness of transformational leadership and innovation, which contributes to

the theory of how leadership and innovation determine the adoption and success of digital technologies.

The rest of the paper is built as follows: the section on the relevant literature review and formulation of the research hypotheses is followed by the research methodology and data analysis approach. The empirical data and discussion then follow with the conclusion of the paper, which includes the implications, limitations, and future research directions.

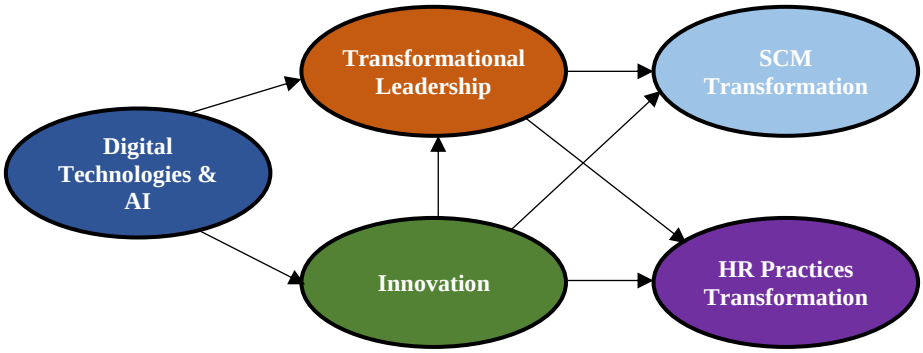

Figure 1. Conceptual research framework of AI-driven transformation in SCM and HR practices

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

The development of electronics, communication infrastructures, and intelligent computing architectures has transformed digital technologies and artificial intelligence (AI) into the indispensable enablers of present-day enterprise systems.[1][13][15]. The technologies are big data analytics, enterprise resource planning (ERP) systems, Internet of Things (IoT), and automation platforms that facilitate organisations to gather, process, and analyse mass real-time data to make informed decisions. These technologies are used within enterprise environments, which have been enabled through the use of electronics, to enable the integration of systems, optimization of processes, as well as intelligent control within organisational functions.[2][3] [4][5]. According to previous research, AI and digital technologies increase the responsiveness and operational efficiency of the enterprise, especially when implemented in an inter-communication and information connection system, which becomes the technological foundation of the digital transformation programme [16][9].

Under the conditions of supply chain management (SCM), digital technologies based on AI have greatly changed the conventional linear supply chains to become intelligent and adaptive. Better resilience via automated risk detection mechanisms, agility via predictive analytics, and better visibility via real-time data sharing are common results of AI-powered SCM systems. Machine learning and analytics can be used to deliver decision intelligence that can enable organisations to perform better demand forecasting, manage inventory, and logistics coordination.[6][7][8][10]. On the same note, human resources (HR) practices have redefined workforce management with more intelligent recruitment solutions, workforce analytics, and performance optimization mechanisms being introduced by AI. Such technologies facilitate gathering and analysing data to make talent acquisition decisions, engage employees, and plan workforce strategies that allow the HR functions to shift their functions of administrative support to strategic organisational partners, as highlighted in previous empirical and conceptual cycles (Table 1).

Although AI and digital technologies have the transformative potential, organisational and behavioural factors lead to the successful adoption and effective use of the technologies. Transformational leadership can be highly instrumental in ensuring that the organisation embraces technology acceptance and undergoes necessary change by establishing a clear vision of the digital organisation, motivating the employees, and easing their resistance to change. Transformational leaders facilitate cultures that embrace learning and encourage experimentation, which are vital in incorporating AI-based systems into business processes. Additionally, the innovation capability is one of the most important organisational processes because it plays a crucial role in applying digital technologies to performance results. The strategic importance of AI adoption reinforces the fact that process and organisational

innovation help firms to restructure workflows and redesign business models, as well as take advantage of technology-driven opportunities.[11][14][20].

- Hypothesis 1(H1): Digital technologies and AI have a positive impact on SCM change.
- Hypothesis 2: Digital technologies and AI have a positive impact on the transformation of HR practices.
- Hypothesis 3 (H3): Transformational leadership is an intermediary variable in the relationship between AI and SCM transformation.
- Hypothesis 4 (H4): Transformational leadership mediates between AI and the transformation of HR practices.
- Hypothesis 5 (H5: Innovation mediates the relationship between AI and SCM transformation.
- Hypothesis 6 (H6): The association of AI with HR practices transformation happens through innovation.

Table 1. Summary of key literature and research gaps

Author(s)	Focus Area	Method	Key Findings	Identified Gap
Bharadwaj et al. (2013)	Digital business strategy and transformation	Conceptual review	Digital technologies reshape enterprise strategy and value creation	Lacks empirical validation linking digital strategy to functional transformations (SCM, HR)
Wamba et al. (2017)	Big data analytics and firm performance	Survey-based empirical study	Analytics capabilities improve performance via dynamic capabilities	Does not examine leadership or innovation as mediating mechanisms
Calatayud et al. (2019)	AI-enabled intelligent supply chains	Conceptual framework	AI enables self-thinking, adaptive, and resilient supply chains	Limited empirical evidence on organizational enablers of AI-driven SCM
Strohmeier (2020)	Digital human resource management	Conceptual analysis	Digital technologies transform HR roles and processes	Absence of integrated models linking AI, leadership, and HR transformation
Verhoef et al. (2021)	Digital transformation research agenda	Multidisciplinary literature review	Digital transformation requires technological and organizational alignment	Calls for empirical studies incorporating leadership and innovation effects

RESEARCH METHODOLOGY

The paper is based on a quantitative, cross-sectional, and explanatory research design; therefore, the relationships between digital technologies, artificial intelligence (AI) transformational leadership, innovation, and outcomes of enterprise transformations are to be investigated in the paper on empirical evidence. A quantitative methodology is suitable as the aim of the study is to test hypothesised causal relationships in a systematic theory. The cross-sectional nature of the design will be used to collect the data at a single time point in order to measure how organisations view AI-induced transformation, whereas the explanatory or research nature of the study will be used to determine both the direct and the mediating effects among all the constructs using multivariate analysis techniques. The information was gathered among industry practitioners who are currently engaged in supply chain management, human resource management, and information technology functions because such respondents have the pertinent knowledge as far as digital technology adoption and organisation transformation initiatives are concerned in (Table 2). The study sample was made up of managers, senior executives, and technology experts employed in the companies where AI-enabled digital systems have been implemented. The questionnaire survey was structured in the form of questionnaires that were conducted both online and

offline. The resulting sample size met the minimum criteria of Partial Least Squares Structural Equation Modelling (PLS-SEM) according to accepted rules of thumb, which indicate a minimum sample size of ten times the maximum number of structural paths into any latent construct within the structure. Structural relationships and mediating effects were analysed using the SmartPLS software to perform PLS-SEM analysis.

Table 2. Measurement constructs and indicators

Construct	Measurement Items (Sample Indicators)	Source	Scale
Digital Technologies & AI	Adoption of AI, analytics, ERP, IoT, and automation in enterprise operations	[1] [20]	5-point Likert
Supply Chain Transformation	Improved supply chain visibility, agility, resilience, and decision intelligence	[6] [10]	5-point Likert
HR Practices Transformation	Use of AI for recruitment, workforce analytics, and performance management	[15] [16]	5-point Likert
Transformational Leadership	Leadership vision, support for digital change, and employee empowerment	Bass & Avolio (1994); Podsakoff et al. (1990)	5-point Likert
Innovation	Process innovation, organizational innovation, and technology-driven improvement	Damanpour (1991); Crossan & Apaydin (2010)	5-point Likert

MEASUREMENT MODEL EVALUATION

The measurement model was tested to examine the reliability and validity of reflective constructs that were applied in this study before the structural relationships were examined. The first methods used to determine the indicator reliability involved analysing the outer loading of all the items of measurement to each construct. Results also show that most of the indicators have been found to have a higher outer loading than the recommended value of 0.70, which depicts the fact that cooperating items sufficiently portrayed their latent construct. There were indicators with marginally decreased loadings, which were subject to review to ensure that their retention would not negatively impact the composite reliability and convergence validity, hence keeping the entire soundness of the measurement model intact. Cronbach's alpha and composite reliability (CR) measures were used to measure internal consistency reliability. The alpha of all constructs was greater than 0.70, the minimum acceptable value, which means that measurement scales are good. Besides, the composite reliability achieved scores far exceeded the acceptable standard, which proved the reliability of the indicators in evaluating their constructs. All the above findings indicate that the constructs employed in the study exhibit high levels of internal consistency whose contents are applicable in the subsequent structural model analysis as indicated in (Table 3).

Convergent validity was assessed through the examination of Average Variance Extracted (AVE) of each of the constructs. AVE values of all the latent variables were above the prescribed threshold of 0.50, which implies that the explanatory power of each construct on the measures of the construct was greater than half the total amount. This result validates the hypothesis that the measurement items measure their respective constructs with high levels of convergence as well as validates existing levels of explanatory power in the constructs. The acceptable convergent validity assists in the effectiveness of the chosen indicators in the sense of capturing the effects of digital technologies and artificial intelligence, transformational leadership, innovation, and enterprise transformation. The Fornell-Larcker criterion as well as the heterograft-monotrait (HTMT) ratio was used to determine discriminant validity. The Fornell-Larcker analysis indicated that the square root of the AVE of individual construct represented was larger than those of the constructs with other constructs, which had sufficient discriminant validity. In addition to this, HTMT values are lower than the conservative value of 0.85 which further supports that the constructs are empirically different between each other. These findings combined assert that the measurement model meets the expected reliability and validity standards and therefore creates a solid basis on which to assess the suggested structural relationships.

Table 3. Reliability and convergent validity results

Construct	Factor Loadings (Range)	Cronbach's Alpha	Composite Reliability (CR)	AVE
Digital Technologies & AI	0.72 – 0.88	0.87	0.91	0.67
Supply Chain Transformation	0.74 – 0.89	0.88	0.92	0.69
HR Practices Transformation	0.71 – 0.86	0.85	0.90	0.64
Transformational Leadership	0.76 – 0.91	0.89	0.93	0.72
Innovation	0.73 – 0.88	0.86	0.91	0.66

STRUCTURAL MODEL EVALUATION

After the construction of a credible and solid measurement model to test the pre-determined hypotheses on the relationships between digital technologies and artificial intelligence (AI), transformational leadership, innovation, and enterprise transformation outcomes, the structural model was tested. The first time the assessment was carried out was through the collinearity, to ascertain that the structural paths were not seriously influenced by the multicollinearity problems. The values of Variance Inflation Factor (VIF) of all the predictor constructs were lower than the recommended value suggesting that there were no critical issues of collinearity and thus the estimated path coefficients could be interpreted with a lot of confidence. Bootstrapping procedure with replicas of a huge sample size was used to test the statistical significance of the directly relating relationships and to test hypothesis. Those findings reveal that digital technologies and AI lead to the notable positive impacts on the transformation of supply chain management (SCM) and human resource (HR) practises transformation, thus, proving the usefulness of the suggested direct hypotheses. The standardised path coefficients demonstrate that the effects are meaningful in magnitude, which can be supported by empirical evidence to state that AI-driven digital technologies are at the epicentre of transformation at an enterprise level. The summary of the path coefficients, t-values and the level of significance is depicted in (Table 4) in details.

The analysis conducted with the use of mediation aimed at studying the indirect outcomes of transformational leadership and innovation on the relationships between digital technologies and AI and the results of transformation. The findings show that transformational leadership moderates the relationship between AI and both SCM and HR transformation, which means that leadership behaviours promote the productivity of technology-based initiatives. Equally, innovation was also established to have a strong mediating impact implying that organisational process and technological innovation capability is key in transforming AI adoption into concrete operation change. The fact that there are influential indirect effects and direct effects substantiates the partial mediation approach as opposed to complete mediation in the proposed framework. The coefficient of determination (R 2) was used to measure the explanatory power of the structural model, and the result revealed moderate and high variance explained on SCM and HR transformation results. This implies that the model has a high predictive power in the transformation of the enterprise process due to AI and digital technologies. Also, analysis of effect size (f 2) showed that the main predictor constructs have significant effects to the endogenous variables, and also that, the values obtained upon analysing predictive relevance (Q 2) using blindfolding procedures are not zero, indicating that the model is relevant in predicting the endogenous variables. These findings, in general, illustrate both the strength and explanatory power of the hypothesised structural model.

Table 4. Structural path coefficients and hypothesis testing

Hypothesis / Path	β Value	t-value	p-value	Decision
H1: Digital Technologies & AI → SCM Transformation	0.42	6.31	< 0.001	Supported
H2: Digital Technologies & AI → HR Practices Transformation	0.38	5.87	< 0.001	Supported
H3: Digital Technologies & AI → Transformational Leadership → SCM Transformation	0.21	3.94	< 0.001	Supported
H4: Digital Technologies & AI → Transformational Leadership → HR Practices Transformation	0.19	3.62	< 0.001	Supported
H5: Digital Technologies & AI → Innovation → SCM Transformation	0.24	4.18	< 0.001	Supported

EVALUATION METRICS

1. **Reliability:**

- **Cronbach's Alpha (α)**:

$$\alpha = \frac{n}{n-1}\left(1-\frac{\sum\sigma^2_{\text{item}}}{\sigma^2_{\text{total}}}\right) \quad (1)$$

Equation (1), Measures internal consistency. Acceptable if α > 0.70.

- **Composite Reliability (CR)**:

$$CR = \frac{(\sum\lambda_i)^2}{(\sum\lambda_i)^2 + \sum\theta_i} \quad (2)$$

In which λ_i is the loading of the item, and 0siis the error variance of the item.

Measures construct reliability is constructed in equation (2). Acceptable if CR > 0.70.

2. **Validity:**

- **Convergent Validity (AVE)**:

$$AVE = \frac{\sum\lambda_i^2}{\sum\lambda_i^2 + \sum\theta_i} \quad (3)$$

Equation (3), Measures the level of representation of the items. Acceptable if AVE > 0.50.

- **Discriminant Validity (Fornell-Larcker Criterion)**:

$$\sqrt{AVE_{\text{construct}}} > \text{correlation between constructs} \quad (4)$$

Affirms that constructs are different. The square root of AVE of every construct must be higher than the ones with the correlation with other constructs in equation (4).

- **HTMT (Heterotrait-Monotrait Ratio)**:

$$HTMT = \frac{\text{Mean of the Heterotrait correlations}}{\text{Mean of the Monotrait correlations}} \quad (5)$$

Measure Discriminant validity, Equation (5). Acceptable if HTMT < 0.85.

3. **Structural Model:**

- **Path Coefficients (β)**:

$$\beta = \frac{\text{Covariance between latent variables}}{\text{Variance of predictor latent variable}} \quad (6)$$

Equation (6), Strength of relationships between constructs. Significant if $p < 0.05$.

- **Explained Variance (R^2)**:

$$R^2 = 1 - \frac{\text{Residual Sum of Squares (RSS)}}{\text{Total Sum of Squares (TSS)}} \quad (7)$$

Equation (7), Measures the percentage of variance that is accounted by the model. Strong model if $R^2 > 0.30$.

- **Effect Size (f^2)**:

$$f^2 = \frac{R^2_{\text{included}} - R^2_{\text{excluded}}}{1 - R^2_{\text{included}}} \quad (8)$$

Equation (8), Tests the impact of independent variable on a dependent variable. The values of f 2 are 0.02, 0.15, and 0.35, which represent small, medium, and large effects, respectively.

- **Predictive Relevance (Q^2)**:

$$Q^2 = 1 - \frac{RSS}{TSS} \quad (9)$$

Equation (9), Measures the predictive ability of the model. Model is relevant if $Q^2 > 0$.

RESULTS AND DISCUSSION

The empirical findings of this research paper support the idea of the suggested conceptual framework that addresses the influence of digital technologies and artificial intelligence (AI) on the outcomes of the enterprise transformation considerably. The analysis of the reviewed structural model indicates that AI-based digital technologies have a strong impact on transformation in the supply chain management (SCM) and transformation in human resource (HR) practises. The findings reveal sufficient explanatory and predictive validity that suggests the applicability of the suggested model in depicting the major processes on which AI-enabled organisational change is based. The fact that the standardised path coefficients and the values of the explained variance are very high underscore the strength of the empirical evidence as demonstrated visually in (Figure 2). Direct effects analysis demonstrates that digital technologies and AI are critical in the improvement of SCM visibility, agility, and resilience and the provision of data-driven HR practises, including intelligent recruitment and performance management. These conclusions can be indicative of the fact that companies that invest to use AI-enabled analytics, automation, and integrated digital platforms will be more likely to gain operational efficiency and strategic flexibility. The statistically significant direct effects further support the hypothesis that the adoption of AI is a root cause of functional change in the electronic-based enterprise systems.

In addition to the direct impacts, the moderating influence of transformational leadership becomes a vital facilitator of the success of the digital transformation. The findings suggest that such leadership behaviours as a vision articulation, empowerment of employees, and the encouragement to change

technologies reinforce the connexion between AI production and transformational results in the enterprise. To make technology acceptance and resistance less, transformational leaders can encourage a culture of trust and learning in order to increase the success of AI-driven initiatives. These results suggest the critical role of leadership development within an organisation that aims to utilise the emerging digital technologies to enable its sustainable transformation. The creation of value is another key element of AI functionality that shall be implemented into real organisational gains through innovation. According to the mediation analysis, innovation-oriented processes and organisational capabilities contribute to the effectiveness of digital technologies in changing SCM and HR greatly. This implies that active use of AI should be accompanied by unceasing innovation of processes and organisational education to achieve the potential of AI in all its glory. The findings align with the previous research on the topics of digital transformation and innovation and support the perspective that innovation, technology, and leadership can influence enterprise change together. Overall, these results provide valuable insights into electronics-empowered digital firms regarding the necessity of combined technological, leadership, and innovation solutions to the long-term generation of a competitive edge.

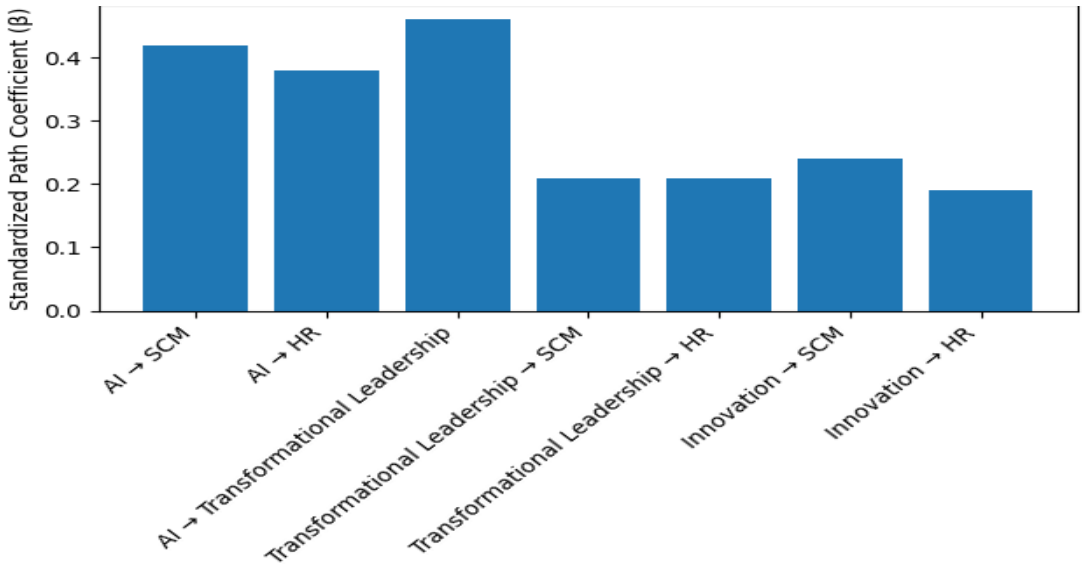

Figure 2. Comparison of standardized path coefficients for direct and mediating relationships in the proposed PLS-SEM model

IMPLICATIONS

The research results can have valuable theoretical implications on the study of digital transformation, leadership, and AI-enabled organisational systems. The process of empirically testing the direct and mediating correlations of digital technologies, artificial intelligence (AI), transformational leadership, innovation, and enterprise transformation outcomes puts this study in reach of the results of previous studies on digital transformation, which have traditionally adopted a more technology-centred approach. It proves that AI-based transformation in the field of supply chain management (SCM) and human resource (HR) practises cannot be fully elucidated only by technological adoption, but it should be viewed through an integrated scheme that includes the aspects of leadership behaviour and development of organisational capabilities. This adds to the theory of leadership because it has empirically allayed the transformational leadership as one of the key mechanisms that ensure that digital investments can be translated into significant transformation results by organisations.

In a management sense, the findings offer practical information to the decision-makers charged with driving digital transformation processes. The well-grounded direct impacts of AI on the transformation of SCM and HR imply that the focus of organisations should be on strategic AI implementation based on developed analytics, robotization, and combined digital platforms. Nevertheless, the mediating relation of transformational leadership has been noted that technological investments should be followed by leadership development programmes leading to the enhancement of vision-oriented change, engagement of employees, and cultures of learning. Managers must also be concerned not only with the

purchase of AI technologies, but also with the development and training of leadership skills that will help accommodate technology and embrace transformation through innovation.

The paper also underlines the managerial significance of innovation as a supporting ability in AI-based firms. The mediation outcomes suggest that the sustained process and organisational innovation play a critical role in the outcome of AI effect on the transformation of the enterprise. It means that managers are supposed to promote experimentation, cross-functional work, and learning in organisations in order to make the most of AI-driven systems. Being innovation-oriented practises help organisations to redesign work processes, optimise the decision-making process and adapt to the swiftly changing digital landscape, a practise which enhances long term competitiveness conceptually briefed in (Figure 3).

Regarding technological implications, the results give a guide in the design and implementation of AI-enabled SCM and HR systems in the electronics-enabled enterprise systems. Technology architects and system designers should strive to create scalable, interoperating and data-driven solutions that cut across AI in interplay with new electronics and communication technologies including the Internet of Things, cloud computing and intelligent communication networks. The findings indicate that there are chances that such technologies can bring real time visibility, decision intelligence and workforce optimization when properly incorporated. Overall, the implications provide a strong rationale that necessitates a holistic view that would streamline technological infrastructure, leadership capabilities, and innovation processes to ensure sustainable AI-driven change in the enterprise.

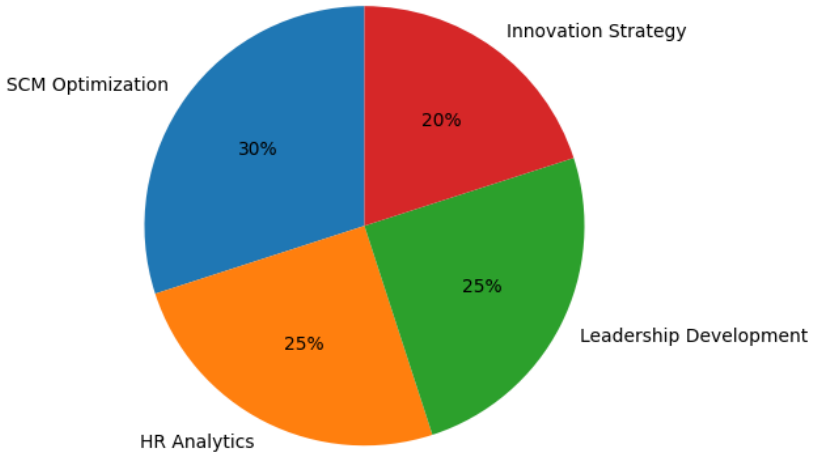

Figure 3. Relative emphasis of managerial implications across SCM optimization, HR analytics, leadership development, and innovation strategy

LIMITATIONS AND FUTURE RESEARCH DIRECTIONS

This study has its share of shortcomings in spite of the contributions it has made in terms of theory and empirically. First, the study has a cross-sectional nature, which entails the creation of the organisational perceptions of digital technologies and artificial intelligence (AI) at one point in time. Although it is suitable to test the proposed relationships, it does not provide an opportunity to assume causal processes and temporal development of AI-led processes of transformation. Digital transformation is dynamic in nature, and changes in technology adoption, leadership behaviour, and innovation capabilities those occurring over a long period of time might affect the results of transformation. Second, the research uses self-reported survey data on the criteria of industry professionals, which can suffer common method bias as well as perceptual errors. Even though the measurement scales and statistical approval systems were used to alleviate these issues, future studies can improve empirical strength through the use of objective performance measures, system-generated data or the mixed method. The most effective way to gain deeper insight into the implementation and management of AI-driven technologies in the organisational environment would also be to integrate the qualitative knowledge of the method by conducting interviews or case studies. Thirdly, the empirical research relies on an industry-specific sample, and this can be a limitation to the external validity of the results of the findings in other sectors and organisations. The character of adoption and digital transformation in the industry may differ depending on the level

of technological maturity, and regulatory factors, and organisational culture. The future research is then advised to take into account multi-industry and multi-country samples to confirm and generalise the suggested model to various economic and institutional set-ups.

Lastly, the field of study may be extended to using the newest technological aspects of the study in future research by incorporating the Internet of Things (IoT), edge-based artificial intelligence, and cyber-physical systems into the researcher. A closer look at the interplay of these new technologies in the context of the leadership and innovation capabilities would be more insightful as regards the next generation digital enterprise systems. This would not only further increase the predictive capacity of the model but also keep the future studies in line with the developing tendencies in smart electronics systems and Industry 4.0 environments.

This paper aimed to empirically test how digital technologies and artificial intelligence (AI) change the supply chain management (SCM) and human resource (HR) practises but through the mediation of transformational leadership and innovation on this transformation through the lens of a quantitative, PLS-SEM-based research method. The results indicate that AI-powered digital technologies have extensive positive impacts on both SCM and HR transformation, which proves their primary contribution to the ability to make decisions based on data, operational flexibility, and effectiveness of the organisation. The path coefficients of the relationship between AI and SCM transformation were 0.42 ($p < 0.001$), and path coefficients of the relationship between HR transformation were 0.38 ($p < 0.001$). The remaining variance explained (R 2) of SCM transformation was 0.72 which showed good fit of the model whereas the R 2 of HR transformation was 0.68 that showed good explanation level. More crucially, the findings indicate that transformational leadership and innovation are found to be important mediating factors that provide increased effectiveness in AI adoption by inducing technology acceptance, organisation learning, and process and structural reconfiguration. These findings remind that the relationship between technological actions and leadership capabilities must be synchronized, with digital transformation and change being impossible without appropriate leadership and innovation-oriented activities. Generally, the research paper adds to the expanding framework of the research on AI-powered enterprise transformation and can be an excellent resource in terms of how organisations working within the context of new digital and electronics-enclosed enterprise ecosystems strive to attain sustainable competitive advantage by integrating technological, managerial, and organisational strategies. This study shows that technological, managerial, and organizational strategies are integrated in the long-term success, which is achieved in the context of new digital and electronics-driven enterprises ecosystems.

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