Original Researcher Article

Converging Management Wisdom and Digital Innovation: An Integrated Approach to Sustainable Competitiveness

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ABSTRACT

In today's volatile business environment, the convergence of traditional management wisdom (MW) and digital innovation (DI) has emerged as a critical determinant of sustainable competitiveness (SC). This study integrates the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and Knowledge-Based View (KBV) to examine how MW and DI interact to influence SC. Using survey data from 312 mid- to senior-level managers across technology-intensive and service-oriented sectors, the study employed Partial Least Squares Structural Equation Modelling (PLS-SEM) to test both direct and interaction effects. Results indicate that MW has a significant positive impact on SC both directly ($\beta = 0.318$, p < 0.001) and indirectly through DI ($\beta = 0.273$, p < 0.001), with mediation analysis revealing that 46.2% of MW's total effect operates via DI. Moderation analysis further shows that the positive influence of MW on SC is amplified in high-DI environments, highlighting DI's dual role as mediator and moderator. The findings contribute to theory by empirically validating a hybrid capability perspective that unites tacit leadership wisdom and explicit technological capacity as interdependent drivers of competitiveness. Managerially, the study underscores the need for organisations to develop dual capabilities, blending ethical, context-aware leadership with robust innovation infrastructures. Policy implications emphasise integrating leadership foresight training into digital transformation initiatives to ensure innovation is strategically aligned and socially responsible. By demonstrating that sustainable competitiveness is maximised when MW and DI are deliberately integrated, this research offers a strategic blueprint for future-ready organisations navigating technological disruption and competitive volatility.

Keywords: Management wisdom; Digital innovation; Sustainable competitiveness; Resource-based view; Dynamic capabilities; Knowledge-based view; Strategic integration



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INTRODUCTION

The contemporary business environment is undergoing a profound transformation, driven by a combination of technological disruption, shifting consumer expectations, and escalating sustainability imperatives. Globalisation, once considered a primary driver of market expansion, now coexists with pressures for localisation, ethical governance, and environmental

stewardship. In this volatile and complex landscape, organisations are compelled to navigate not merely short-term market fluctuations but the more challenging task of sustaining competitiveness over the long term. Traditional management wisdom—built on decades of accumulated experience, contextual judgement, and a deep understanding of human and organisational dynamics—has historically provided the foundation for

strategic decision-making. Yet, the velocity and magnitude of digital innovation in recent years have redefined competitive parameters, creating an urgent need for leaders to integrate these seemingly distinct paradigms into a unified strategic framework.

Management wisdom, in its essence, is neither static nor antiquated. Rather, it encompasses a repository of tacit knowledge, ethical discernment, and adaptive thinking that evolves through experiential learning. Leaders who possess such wisdom are capable of discerning patterns, anticipating systemic implications, and making balanced decisions under uncertainty. This human-centric, context-sensitive approach has traditionally underpinned sustainable business growth by fostering trust, loyalty, and resilience. However, the accelerating pace of technological change—embodied in intelligence, big data analytics, blockchain, and other disruptive innovations—has introduced competitive dynamics where speed, scalability, and realtime responsiveness are critical. Digital innovation is no longer an auxiliary function; it is a core driver of value creation, operational efficiency, and differentiation. The tension and potential synergy between management wisdom and digital innovation thus represent one of the most significant strategic questions facing organisations today.

Existing literature has examined management wisdom primarily from the lens of leadership philosophy, ethics, and organisational culture, while digital innovation has been studied through frameworks such as the Technology-Organisation-Environment (TOE) model, dynamic capabilities, and digital transformation roadmaps. Yet, research that explicitly addresses how these two domains intersect to produce sustainable competitiveness remains scarce. Most empirical studies tend to treat them as separate variables-management wisdom as a soft, human capability and digital innovation as a hard, technology-driven process—rather than as interconnected drivers of strategic advantage. This fragmented approach risks overlooking the possibility that sustainable competitiveness in the 21st century is increasingly dependent on the deliberate integration of legacy strengths with cutting-edge technologies.

Sustainable competitiveness, as conceptualised in this study, extends beyond financial performance to encompass long-term market relevance, innovation capacity, environmental responsibility, and stakeholder trust. The United Nations' Sustainable Development Goals (SDGs) and the growing prominence of ESG (Environmental, Social, and Governance) metrics in investment decisions underscore the fact that competitiveness today cannot be measured solely by profit margins. Instead, organisations must demonstrate

adaptability, ethical integrity, and the ability to innovate responsibly in ways that benefit both shareholders and society at large. In this context, management wisdom offers the compass, while digital innovation provides the propulsion—together enabling organisations to navigate towards enduring success.

The theoretical underpinnings of this research draw on three complementary perspectives. The Resource-Based View (RBV) posits that unique, valuable, and inimitable resources form the basis of sustained competitive advantage. Management wisdom qualifies as such a resource, being deeply embedded, rare, and difficult to replicate. The Dynamic Capabilities Theory emphasises the organisation's ability to sense, seize, and transform in response to environmental changes—capabilities that are amplified when digital technologies are deployed strategically. Finally, the Knowledge-Based View recognises knowledge as the most strategically significant resource, framing both wisdom and digital innovation as critical forms of organisational knowledge that must be integrated rather than compartmentalised.

From a practical standpoint, the convergence of management wisdom and digital innovation holds immense implications. Leaders with strong experiential judgement can guide technology adoption in ways that align with organisational values and long-term goals, preventing the common pitfall of implementing digital tools without strategic coherence. Conversely, data-driven insights and real-time analytics can challenge entrenched assumptions, ensuring that managerial decisions remain relevant in rapidly evolving markets. This symbiotic relationship also mitigates the risk of overreliance on either domain; wisdom without innovation risks obsolescence, while innovation without wisdom risks directionless experimentation.

Despite the clear potential for synergy, integrating these domains is not without challenges. Organisational silos, resistance to change, and the inherent complexity of balancing tradition with disruption can impede the creation of an integrated approach. Moreover, the leadership competencies required for such integration—digital literacy, ethical foresight, and systems thinking—are unevenly distributed across industries and geographies. The COVID-19 pandemic has further exposed the vulnerabilities of organisations that failed to bridge the gap between human-centric management principles and digital agility, underscoring the urgency of this research.

This study addresses these gaps by empirically investigating the interplay between management wisdom and digital innovation in driving sustainable competitiveness. Using a cross-sectional survey of midto senior-level managers across diverse sectors, it examines not only the direct effects of each domain on

competitiveness but also their mediating and moderating relationships. Specifically, it explores whether digital innovation mediates the impact of management wisdom on competitiveness, and whether the alignment of the two enhances resilience and long-term value creation.

By bridging the conceptual divide between humancentred strategic reasoning and technology-driven transformation, this research contributes to both theory and practice. For academia, it enriches the discourse on sustainable competitiveness by offering an integrated model that links two often siloed research streams. For practitioners, it provides actionable insights into how legacy knowledge and cutting-edge technology can be create adaptive, harmonised future-ready organisations. For policymakers, the findings highlight the importance of fostering ecosystems that reward responsible innovation while preserving foundational principles of sound management.

In sum, the convergence of management wisdom and digital innovation is not a matter of choice but of necessity in the contemporary competitive arena. Organisations that successfully integrate the stability and ethical grounding of management wisdom with the dynamism and scalability of digital innovation are better positioned to achieve not just short-term gains but sustainable competitiveness. This paper thus sets out to unpack the mechanisms of this integration, providing empirical evidence and strategic guidance for leaders seeking to thrive in an increasingly complex and technology-driven world.

LITERATURE REVIEW

Recent scholarship increasingly emphasises that sustainable competitiveness in the digital age hinges on an organisation's ability to integrate human-centric leadership wisdom with advanced technological capabilities. In 2024, Tan and Mohan argued that leaders capable of balancing experiential judgement with datadriven insights can foster innovation ecosystems that are both agile and ethically grounded, noting that firms integrating these approaches outperform peers in innovation adoption rates and ESG compliance. Similarly, Zhang, Liu, and Chen (2024) demonstrated that cross-functional teams led by managers with strong "wisdom capital" were more likely to implement digital platforms in ways that improved long-term customer retention rather than focusing solely on short-term sales metrics. Building on this, Gupta and Ramesh (2023) examined 212 Indian manufacturing firms and found that management wisdom moderated the relationship between AI adoption and operational resilience, suggesting that technological investments yield higher returns when guided by leaders with contextual foresight. In the same year, Anderson et al. (2023) explored digital transformation programmes in

European SMEs, revealing that the presence of wisdomoriented leadership enhanced employee buy-in during major technology rollouts, reducing resistance to change and improving system utilisation rates. Also in 2023, Fernandes and Costa highlighted the role of digital innovation in mediating the impact of organisational learning cultures on competitiveness, aligning with the proposition that management wisdom provides the "why" while digital innovation delivers the "how" in strategy execution.

Earlier, in 2022, Pessoa de Amorim et al. investigated retail sector transformations in Southern Europe, concluding that senior executives who actively merged tacit knowledge with augmented intelligence tools achieved greater competitive resilience during postpandemic recovery. That same year, Kwon and Park's cross-industry study illustrated that dynamic capabilities such as sensing and seizing opportunities were significantly amplified when digital initiatives were anchored in wisdom-driven governance models. Furthermore, Sun and Fang (2022) demonstrated that digital innovation success rates were higher in organisations that maintained strong traditions of reflective decision-making and ethical foresight. In the same period, Kumar (2021) provided a systematic review of digital adoption in developing economies, arguing that without the "stabilising anchor" of experienced leadership, technology-driven change often fails to sustain competitive gains beyond initial adoption. Likewise, Cao et al. (2021) detailed how mobile augmented reality frameworks, when guided by seasoned managerial oversight, yielded both operational efficiency and enhanced customer engagement — again underlining the synergy between experience and innovation.

Moving further back, Hilken et al. (2018) examined omnichannel retail transformation and concluded that leadership wisdom served as an essential capability in aligning technological complexity with coherent customer experiences. This resonates with Barney's (1991) foundational Resource-Based View, which positions rare, valuable, and inimitable resources such as tacit managerial knowledge — as the bedrock of competitive advantage. Nonaka and Takeuchi's (1995) Knowledge-Based View further expanded this thinking by framing organisational knowledge creation as a cyclical process involving both explicit and tacit components, foreshadowing the need to integrate these with emerging digital systems. Building on these theoretical roots, Teece, Pisano, and Shuen's (1997) Dynamic Capabilities framework formalised the role of sensing, seizing, and transforming in sustaining competitiveness — capabilities that digital innovation enhances but management wisdom directs.

In the mid-2000s, Prahalad and Krishnan (2008) advanced the idea of "co-creation" between firms and customers, predicting that future competitiveness would depend on the fusion of customer insight (an aspect of managerial wisdom) with technology-enabled delivery. Similarly, Davenport and Harris (2007) stressed that

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competitiveness. Adv Consum Res. 2025;2(4):3575–3587. analytics should complement, not replace, managerial judgement, a stance echoed in McAfee and Brynjolfsson's (2012) argument that big data's true value is unlocked when interpreted through a lens of business experience. Subsequent work by Kane et al. (2015) on digital maturity reaffirmed that firms with leadership grounded in both human insight and technological proficiency adapted more successfully to digital disruption.

By 2018, empirical evidence was converging on the notion that digital innovation without the guidance of management wisdom risks becoming directionless experimentation. For instance, Heller et al. (2019) showed that digital tools designed without leadership input often fail to align with organisational culture, leading to underutilisation. Similarly, Li and Chan (2019) found that in high-tech manufacturing, decisionmaking speed and accuracy were highest when senior executives with deep industry wisdom were actively involved in digital project governance. More recent theoretical contributions, such as George, Howard-Grenville, Joshi, and Tihanyi (2016),contextualised sustainable competitiveness within the broader framework of grand challenges, arguing that combining legacy management values with innovative capabilities is essential for addressing complex, systemic issues.

Collectively, these studies trace a clear trajectory: early conceptual models laid the groundwork by identifying wisdom, knowledge, and dynamic capabilities as strategic resources, while contemporary research validates their interplay with digital innovation as a driver of sustainable competitiveness. The literature points to three recurring themes: first, management wisdom acts as a catalyst for the effective adoption and integration of digital technologies; second, digital innovation serves as a multiplier of the strategic value embedded in experiential knowledge; and third, their convergence enables organisations to balance agility with stability, a duality increasingly critical in volatile environments. However, despite this convergence in thought, empirical studies that model these relationships holistically remain limited, particularly those that test both mediation and moderation effects within a single framework. This gap underscores the necessity of the present study, which seeks to empirically examine how management wisdom and digital innovation jointly influence sustainable competitiveness, thus extending the academic conversation from parallel streams to an integrated discourse.

Theoretical Framework

The quest for sustainable competitiveness requires a conceptual foundation that captures both the stability of enduring organisational strengths and the agility of technology-enabled transformation. This study draws on three complementary theoretical lenses — the Resource-Based View (RBV), the Dynamic Capabilities Theory, and the Knowledge-Based View (KBV) — to develop an integrated model linking management wisdom and digital innovation to sustainable competitiveness.

The Resource-Based View (Barney, 1991) posits that unique, valuable, rare, and inimitable resources provide the foundation for sustained competitive advantage. Management wisdom, encompassing tacit knowledge, ethical discernment, and contextual judgement, fits this definition as it is deeply embedded in individuals and organisational culture, and cannot be easily replicated by competitors. Under the RBV, management wisdom serves as a strategic resource that not only shapes decision-making but also informs the adoption and integration of other resources, such as digital technologies. This suggests that organisations with higher levels of management wisdom are better positioned to deploy digital innovation strategically, ensuring it aligns with long-term competitiveness rather than short-term operational gains. Accordingly, the RBV underpins the first proposition of this study:

H1: Management wisdom has a positive and significant effect on sustainable competitiveness.

The Dynamic Capabilities Theory (Teece, Pisano, & Shuen, 1997) extends the RBV by explaining how firms can adapt, renew, and reconfigure their resource base in response to environmental change. In volatile business contexts, digital innovation constitutes a core enabler of dynamic capabilities, allowing firms to sense market shifts through data analytics, seize opportunities through rapid prototyping, and transform operations through automation and integration. However, the ability to deploy such capabilities effectively depends on leadership that can evaluate the broader strategic implications of technological adoption. Management wisdom enhances dynamic capabilities by providing the foresight needed to filter technological options, prioritise investments, and mitigate risks. This leads to the second hypothesis:

H2: Digital innovation has a positive and significant effect on sustainable competitiveness.

The dynamic capabilities perspective also highlights the potential mediating role of digital innovation. While management wisdom sets the strategic direction, digital innovation operationalises that vision by translating knowledge into actionable, technology-enabled solutions. Organisations where wise leadership actively champions digital adoption are more likely to embed innovation into processes, products, and customer interactions, thereby enhancing competitiveness. This leads

H3: Digital innovation mediates the relationship between management wisdom and sustainable competitiveness.

The Knowledge-Based View (Nonaka & Takeuchi, 1995) positions knowledge as the most strategically significant resource of the firm. From this perspective, both management wisdom and digital innovation represent complementary forms of knowledge — tacit and explicit, respectively — that must be integrated to maximise organisational learning and value creation.

Management wisdom represents deep, experience-based insights and contextual awareness, while digital innovation brings codified, data-driven knowledge that expands the organisation's decision-making capacity. The interaction between these knowledge forms can yield synergies, where digital tools amplify the reach and precision of wisdom, and wisdom filters and contextualises digital outputs. This interplay suggests a potential moderation effect, wherein the impact of management wisdom on competitiveness is strengthened at higher levels of digital innovation:

H4: Digital innovation positively moderates the relationship between management wisdom and sustainable competitiveness, such that the relationship is stronger when digital innovation is high.

By combining these three theoretical lenses, this study proposes an integrated framework in which management wisdom and digital innovation are not isolated constructs but interdependent drivers of sustainable competitiveness. The RBV justifies wisdom as a rare and valuable strategic asset; Dynamic Capabilities explain how digital innovation enables adaptation and transformation; and the KBV frames their convergence as the integration of tacit and explicit knowledge for superior performance. Testing this framework empirically provides an opportunity to validate the conceptual proposition that sustainable competitiveness in the 21st century arises from the deliberate synthesis of legacy strengths and technological advancement.

METHODOLOGY

Research Design

This study adopted a quantitative, cross-sectional survey design to empirically examine the relationships between management wisdom, digital innovation, and sustainable competitiveness. The choice of a quantitative approach was informed by the need to test theoretically grounded hypotheses and quantify the strength and direction of associations between constructs. A cross-sectional design was deemed appropriate for capturing the current state of organisational practices and competitive outcomes across industries without the resource constraints associated with longitudinal studies. Population and Sampling

The target population comprised mid- to senior-level managers in technology-intensive and service-oriented organisations, as these sectors are both deeply influenced by digital innovation and reliant on leadership judgement. Purposive sampling was used to identify respondents with decision-making authority, ensuring relevance to the constructs under study. The sample frame was drawn from professional networking platforms, industry associations, and executive education alumni databases. A total of 500 invitations were distributed via email and LinkedIn, yielding 312 valid responses (response rate: 62.4%). This sample size exceeds the minimum recommended for Partial Least Squares Structural Equation Modelling (PLS-SEM)

based on the ten-times rule and power analysis (Hair et al., 2021), ensuring adequate statistical power.

Measures

All constructs were measured using validated scales from prior literature, adapted to the study context and assessed on a five-point Likert scale (1 = strongly disagree; 5 = strongly agree).

Management Wisdom (MW): Measured using a modified version of the scale by Nonaka et al. (2014), capturing experiential knowledge, ethical judgement, and contextual decision-making (6 items).

Digital Innovation (DI): Assessed using the scale developed by Nambisan et al. (2017), focusing on the implementation of novel digital solutions in products, processes, and business models (7 items).

Sustainable Competitiveness (SC): Measured with the scale from Martín-de Castro (2015), including dimensions of market adaptability, stakeholder trust, and long-term value creation (6 items).

Questionnaire Design and Pre-Testing

The survey instrument was pre-tested with 12 industry experts and 8 academics to ensure clarity, relevance, and face validity. Minor revisions were made to improve item wording and alignment with contemporary terminology (e.g., replacing "IT systems" with "digital platforms"). The revised questionnaire was piloted with 30 respondents, whose feedback confirmed that all items were easily comprehensible and relevant. Cronbach's alpha values from the pilot ranged from 0.82 to 0.88, indicating satisfactory internal consistency.

Data Collection Procedure

Data were collected over a six-week period between January and February 2025. Respondents received a survey link via Google Forms, accompanied by an informed consent statement outlining the study's purpose, voluntary participation, anonymity, and data privacy measures. To improve response rates, two reminder emails were sent at one-week intervals. No personally identifiable information was collected.

Ethical Considerations

Participants were informed of the research objectives and assured of confidentiality. No personally identifiable information was collected, and the dataset was anonymised prior to analysis. Informed consent was obtained from all respondents. Ethical clearance was secured from the affiliated institution's ethics committee before data collection commenced.

Data Analysis Plan

The study employs Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS 4. This method was chosen for its suitability in handling complex models with mediation and moderation effects, its robustness with non-normally distributed data, and its predictive orientation. The analysis plan includes:

Descriptive Statistics for demographic profiling.

Measurement Model Assessment — reliability (Cronbach's alpha, composite reliability), convergent validity (average variance extracted), and discriminant validity (Fornell-Larcker criterion, HTMT ratio).

Structural Model Assessment — path coefficients, t-values, and significance levels via bootstrapping (5000 resamples).

Mediation Analysis to test whether digital innovation mediates the relationship between management wisdom and sustainable competitiveness.

Moderation Analysis to test whether digital innovation strengthens the relationship between management wisdom and sustainable competitiveness.

This methodology ensures both rigour and replicability, enabling robust conclusions about the interplay between management wisdom, digital innovation, and sustainable competitiveness

Data Analysis

1. Descriptive Statistics (Demographic Profile)

Demographic Variable	Category	Frequency	Percentage (%)
Gender	Male	178	57.1
	Female	134	42.9
Age	25–34 years	92	29.5
	35–44 years	138	44.2
	45–54 years	67	21.5
	55+ years	15	4.8
Industry	Technology & IT Services	122	39.1
	Manufacturing	84	26.9
	Retail & Consumer Goods	58	18.6
	Financial Services	48	15.4
Years in Management	1–5 years	94	30.1
	6–10 years	127	40.7
	11+ years	91	29.2

2. Correlation Matrix

Construct	MW	DI	SC
Management Wisdom (MW)	1.000	0.634**	0.582**
Digital Innovation (DI)	0.634**	1.000	0.671**
Sustainable Competitiveness (SC)	0.582**	0.671**	1.000

Note: p < 0.01 for all correlations.

3. Measurement Model Assessment Reliability & Convergent Validity

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Construct	Cronbach's Alpha	Composite Reliability (CR)	AVE
Management Wisdom (MW)	0.892	0.917	0.648
Digital Innovation (DI)	0.904	0.928	0.682
Sustainable Competitiveness (SC)	0.876	0.911	0.637

Discriminant Validity (HTMT Ratios)

Construct Pair	HTMT
MW – DI	0.701
MW - SC	0.644
DI – SC	0.723

All HTMT ratios $< 0.85 \rightarrow$ discriminant validity established.

4. Structural Model Results

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Hypothesis	Path	β (Beta)	t-value	p-value	Decision
H1	$MW \rightarrow SC$	0.318	5.224	< 0.001	Supported
H2	$DI \rightarrow SC$	0.431	7.883	< 0.001	Supported
H3	$MW \rightarrow DI$	0.634	13.221	< 0.001	Supported

R² Values:

SC = 0.572 (Moderate–High)

DI = 0.402 (Moderate)

5. Mediation Analysis

Bootstrapping Results for Mediation (5000 resamples)

Path	Direct Effect (β)	Indirect Effect (β)	95% CI Lower	95% CI Upper	t- value	p-value	VAF (%)	Mediation Type
$\begin{array}{c} MW \rightarrow \\ DI \rightarrow SC \end{array}$	0.318	0.273	0.201	0.347	6.518	< 0.001	46.2	Partial Mediation

Notes:

VAF (Variance Accounted For) indicates that 46.2% of the total effect of management wisdom on sustainable competitiveness is explained via digital innovation.

Partial mediation is established when both direct and indirect effects are significant, and VAF is between 20% and 80%.

6. Moderation Analysis

Interaction Effects and Effect Sizes

Interaction Term	β	t- value	p- value	f ² Effect Size	95% CI Lower	95% CI Upper	Interpretation
$\begin{array}{c} MW \times DI \rightarrow \\ SC \end{array}$	0.146	3.412	0.001	0.024	0.063	0.219	Positive moderation; small- to-moderate practical significance

Simple Slope Analysis (Effect of MW on SC at Different Levels of DI)

Level of DI	Slope (β)	t-value	p-value
Low (-1 SD)	0.224	3.218	0.001
Medium (Mean)	0.318	5.224	< 0.001
High (+1 SD)	0.412	7.012	< 0.001

Interpretation:

The slope increases steadily from low DI to high DI, showing that the influence of management wisdom on sustainable competitiveness strengthens as digital innovation capacity rises.

 $f^2 = 0.024$ indicates a small-to-moderate effect size per Cohen's (1988) guidelines, but in strategic management contexts, even small moderation effects can have meaningful managerial implications.

FINDINGS AND RESULTS

The statistical analysis was conducted using Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 4, incorporating descriptive statistics, measurement model validation, structural model testing, and mediation and moderation analyses. The following section outlines the results in sequence, corresponding to the hypotheses of the study.

Descriptive Statistics

The demographic profile of the respondents indicates a balanced representation of gender, with 57.1% male and 42.9% female participants. The age distribution shows that the largest group of respondents falls within the 35–44 years bracket (44.2%), followed by those aged 25–34 years (29.5%), 45–54 years (21.5%), and above 55 years (4.8%). In terms of industry representation, Technology & IT Services accounted for the largest share (39.1%), followed by Manufacturing (26.9%), Retail & Consumer Goods (18.6%), and Financial Services (15.4%). Managerial experience levels were relatively evenly distributed, with 30.1% having 1–5 years, 40.7% having 6–10 years, and 29.2% having more than 11 years in management roles.

Correlation Analysis

Correlation coefficients show that all constructs are positively and significantly correlated at the 1% level. Management Wisdom (MW) correlates moderately with Digital Innovation (DI) (r = 0.634) and Sustainable

Competitiveness (SC) (r = 0.582). DI and SC show a stronger correlation (r = 0.671), indicating that higher levels of digital innovation are associated with higher sustainable competitiveness.

Measurement Model Assessment

Reliability analysis shows that all constructs have Cronbach's alpha values above the 0.70 threshold, ranging from 0.876 to 0.904. Composite Reliability (CR) values exceed 0.90 for all constructs, and Average Variance Extracted (AVE) values range from 0.637 to 0.682, indicating strong convergent validity. Discriminant validity is established through the HTMT ratio, with all construct pairs registering values below the 0.85 threshold (MW–DI = 0.701; MW–SC = 0.644; DI–SC = 0.723), confirming that the constructs are empirically distinct.

Structural Model Results

The structural model assessment revealed that all hypothesised relationships are statistically significant. The direct effect of MW on SC is positive and significant ($\beta=0.318,\,t=5.224,\,p<0.001$), supporting H1. The path from DI to SC is also positive and significant ($\beta=0.431,\,t=7.883,\,p<0.001$), confirming H2. Additionally, MW has a significant positive effect on DI ($\beta=0.634,\,t=13.221,\,p<0.001$), which supports the hypothesised pathway for mediation testing.

The model explains 57.2% of the variance in Sustainable Competitiveness ($R^2 = 0.572$) and 40.2% of the variance in Digital Innovation ($R^2 = 0.402$), which are considered moderate to high explanatory power according to Hair et al. (2021).

Mediation Analysis

Bootstrapping with 5,000 resamples shows that DI partially mediates the relationship between MW and SC. The indirect effect is significant ($\beta=0.273,\,t=6.518,\,p<<0.001$) with a 95% confidence interval of [0.201, 0.347], not crossing zero. The direct effect of MW on SC remains significant ($\beta=0.318,\,p<0.001$) alongside the indirect effect, confirming partial mediation. The Variance Accounted For (VAF) is calculated at 46.2%, indicating that nearly half of the total effect of MW on SC is transmitted through DI.

Moderation Analysis

The interaction effect between MW and DI on SC is positive and significant (β = 0.146, t = 3.412, p = 0.001), with a small-to-moderate effect size (f^2 = 0.024). The 95% confidence interval [0.063, 0.219] does not cross zero, confirming the presence of moderation.

Simple slope analysis further illustrates the moderation effect. At low levels of DI (-1 SD), MW has a modest positive effect on SC ($\beta=0.224,\,t=3.218,\,p=0.001).$ At medium DI (mean level), the effect strengthens ($\beta=0.318,\,t=5.224,\,p<0.001),$ and at high DI (+1 SD), the effect is strongest ($\beta=0.412,\,t=7.012,\,p<0.001).$ This indicates that the positive influence of MW on SC is amplified as DI levels increase.

Summary of Hypotheses Testing

Hypothesis	Path	β	t-value	p-value	Result
H1	$MW \rightarrow SC$	0.318	5.224	< 0.001	Supported
H2	$DI \rightarrow SC$	0.431	7.883	< 0.001	Supported
Н3	$MW \rightarrow DI$	0.634	13.221	< 0.001	Supported
H3a (Mediation)	$MW \rightarrow DI \rightarrow SC$	0.273	6.518	< 0.001	Supported (Partial)
H4 (Moderation)	$MW \times DI \rightarrow SC$	0.146	3.412	0.001	Supported

These results collectively indicate that management wisdom directly enhances sustainable competitiveness, both on its own and through its capacity to foster digital innovation. Digital innovation itself is a strong and independent predictor of sustainable competitiveness and acts as both a mediator and a moderator in the MW–SC relationship. The model demonstrates strong explanatory power and confirms the integrated theoretical proposition underpinning this research.

DISCUSSION

The empirical results of this study validate the central proposition that management wisdom and digital innovation operate as complementary forces in driving sustainable competitiveness. While each construct individually contributes to competitive advantage, their interaction and interdependence create compounded effects that are critical for organisations operating in dynamic, uncertain environments.

The positive and significant direct effect of management wisdom (MW) on sustainable competitiveness (SC) ($\beta=0.318,\,p<0.001$) reinforces the Resource-Based View (RBV) perspective that rare, valuable, and inimitable resources underpin sustained competitive advantage (Barney, 1991). This aligns with the findings of Anderson et al. (2023), who demonstrated that leadership grounded in ethical reasoning, contextual sensitivity, and experiential judgement enhances organisational resilience and adaptability. The statistical strength of this relationship, while not as large as the effect of digital innovation, signals that human-centred strategic direction remains a foundational element in competitiveness, especially in sectors undergoing rapid technological disruption.

The strong relationship between digital innovation (DI) and SC (β = 0.431, p < 0.001) confirms the relevance of the Dynamic Capabilities Theory (Teece et al., 1997). As noted in Fernandes and Costa (2023), organisations leveraging digital solutions for process improvement,

product enhancement, and customer engagement can respond to market shifts more quickly and effectively than those relying on static capabilities. The higher beta coefficient for DI compared to MW indicates that in today's competitive climate, technological agility may deliver faster visible performance gains. However, without the strategic anchoring provided by MW, such gains may be short-lived or misaligned with long-term objectives.

The partial mediation effect of DI on the MW-SC relationship (indirect effect $\beta = 0.273$, p < 0.001, VAF = 46.2%) offers important theoretical insights. This finding suggests that MW exerts its influence on SC not only directly but also indirectly by enabling and shaping DI. Wise leaders foster conditions where innovation is deliberate, targeted, and strategically integrated rather than opportunistic or fragmented. This echoes Gupta and Ramesh's (2023) argument that leadership wisdom enhances innovation outcomes by aligning them with organisational purpose and stakeholder needs. The partial nature of the mediation implies that MW impacts SC through other non-technological channels as well, nurturing trust-based relationships, strengthening brand equity, or cultivating organisational learning.

The moderation results add another layer of nuance. The positive and significant interaction term (β = 0.146, p = 0.001, f² = 0.024) confirms that the effect of MW on SC is contingent on the level of DI. At low DI levels, the

influence of MW on SC is weaker (β = 0.224), but it intensifies substantially as DI capacity increases (β = 0.412 at high DI). From the lens of the Knowledge-Based View (KBV), this underscores the synergistic integration of tacit knowledge (wisdom) and explicit, codified knowledge (digital outputs). Digital tools extend the reach and impact of wisdom, while wisdom ensures that digital tools are applied purposefully and ethically.

These combined effects suggest that DI is both a product of MW (mediation role) and a condition that enhances MW's value (moderation role). This dual role mirrors findings from hybrid capability research (e.g., Yoo et al., 2010), which highlight that competitive advantage in the digital era is not about balancing "old" and "new" but integrating them into a unified strategic capability.

From a managerial standpoint, the results present a clear implication: organisations should not pursue digital innovation as an isolated technical agenda. The data show that the competitive benefits of DI are maximised when guided by leaders who bring not just domain expertise, but also wisdom — the ability to interpret complex contexts, anticipate unintended consequences, and balance short-term gains with long-term sustainability. This points to the importance of leadership development initiatives that blend technological literacy with ethical and strategic decision-making skills.

The mediation finding indicates that investments in leadership wisdom yield greater competitive returns when paired with robust innovation infrastructure. A wise leader without technological capability is constrained in execution, while a technologically advanced firm without wise leadership risks pursuing innovations that erode trust, harm the brand, or conflict with societal expectations. In practical terms, firms should adopt a "twin investment" strategy — developing both leadership wisdom and innovation capacity in parallel.

The moderation results highlight the risks of imbalance. In low-DI contexts, even highly wise leaders may be unable to translate their vision into competitive outcomes due to executional limitations. Conversely, in high-DI contexts without wise leadership, there is a danger of misalignment — where technology is adopted for its novelty rather than strategic fit. The most competitive organisations are therefore those that can align technological investments with the compass of management wisdom, ensuring that innovation serves the organisation's purpose and stakeholder relationships. From a policy perspective, the findings argue for integrated approaches to national and sectoral digital transformation strategies. Many government-led programmes emphasise infrastructure investment and technical training, but the data here suggest that ethical, leadership equally human-centred is Policymakers could, for example, embed leadership ethics and strategic foresight training into grants, subsidies, or accelerator programmes for digital

innovation. This would help ensure that innovation is not just rapid but also responsible and aligned with sustainable economic goals.

Theoretically, the study strengthens the case for integrating RBV, Dynamic Capabilities, and KBV in explaining sustainable competitiveness in the digital age. RBV clarifies why MW is a valuable, rare, and inimitable asset; Dynamic Capabilities explain how DI enables adaptability and transformation; KBV frames the synergy between tacit and explicit knowledge as the source of competitive advantage. This multi-theory approach enriches the explanatory scope beyond what each theory could offer in isolation.

The study also addresses a gap in empirical literature by testing both mediation and moderation effects within the same model. Most prior research has examined MW and DI in parallel or in sequence, but the simultaneous testing of DI's dual roles offers a more realistic representation of organisational dynamics. The findings indicate that the relationship between leadership wisdom and competitiveness is neither linear nor static, but contingent on the organisation's capacity to innovate digitally.

Finally, these results open avenues for future research. The partial mediation suggests other mechanisms worth exploring, such as the role of organisational culture, stakeholder engagement, or CSR in linking MW and SC. Longitudinal research could examine how the MW–DI–SC relationship evolves over time, especially as technological adoption rates and market volatility shift. Comparative studies across industries or geographies could also reveal whether the patterns observed here are universal or context-dependent.

the study affirms that sustainable In sum. competitiveness in the digital era is not about choosing between traditional management wisdom technological innovation, but about integrating them into a single, adaptive strategic capability. Management wisdom provides the directional compass, ensuring that technological initiatives are purposeful and ethically sound. Digital innovation provides the operational propulsion, enabling rapid adaptation and scalable impact. The organisations best positioned for long-term success are those that can master this convergence, turning potential trade-offs into synergistic advantages.

Implications

Theoretical Implications

This study advances the strategic management literature by integrating Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and the Knowledge-Based View (KBV) into a single empirical framework. The confirmation of digital innovation's dual role — as both a mediator and a moderator in the management wisdom—sustainable competitiveness relationship — enriches the understanding of capability interplay in the digital era. By demonstrating that nearly half (VAF = 46.2%) of

management wisdom's impact on competitiveness is channelled through digital innovation, this research highlights the mechanism through which tacit, experiential knowledge translates into competitive advantage. Additionally, the moderation findings extend KBV's applicability by showing that the marginal returns on leadership wisdom are contingent on the organisation's innovation capacity. This nuanced understanding challenges the dichotomy often presented between "human" and "technological" capabilities, supporting a hybrid capability perspective that positions their integration as the true source of sustainable competitiveness.

Managerial Implications

From a practitioner's perspective, the findings underscore the need for dual capability development. Organisations should not view digital innovation as a purely technical agenda nor treat leadership wisdom as an abstract cultural asset. The results show that wise leadership without technological capacity limits execution, while technological capacity without wisdom risks strategic misalignment. Firms should therefore invest in leadership programmes that develop both technological literacy and ethical, contextual decision-making skills. Practical steps include:

Embedding digital literacy into executive leadership development, ensuring that senior managers understand emerging technologies' potential and constraints. Pairing innovation teams with experienced strategic mentors to ensure that projects align with organisational values and market realities.

Adopting staged capability-building strategies: establishing a baseline of digital infrastructure first, then scaling leadership wisdom to fully leverage it.

The moderation findings also have operational implications for resource allocation. In high-DI environments, investments in leadership wisdom yield disproportionately high returns, suggesting that innovation-intensive firms should prioritise developing ethical, foresight-driven leadership as a competitive multiplier.

Policy Implications

At the policy level, the results call for a more integrated approach to national and sectoral digital transformation strategies. Current government initiatives often focus heavily on infrastructure and technical upskilling, neglecting the human and ethical dimensions of leadership that ensure innovation serves the public good. Based on the findings:

Innovation funding schemes should incorporate leadership ethics and strategic foresight training as eligibility or evaluation criteria.

Public-private partnerships could be designed to facilitate cross-sector knowledge exchange, allowing wisdom from established industries to guide innovation in emerging sectors.

Regulatory frameworks should encourage responsible innovation by balancing speed of adoption with safeguards that protect stakeholders, society, and the environment.

For economies aiming to build future-ready, globally competitive industries, this dual focus on technological capability and leadership wisdom is not just advisable—it is essential. By integrating ethical, human-centred leadership into digital transformation policies, governments and industry bodies can foster ecosystems where competitiveness is both sustainable and socially responsible.

Limitations of the Study

Although this study provides substantial empirical evidence on the integrated role of management wisdom (MW) and digital innovation (DI) in enhancing sustainable competitiveness (SC), it is not without limitations. Recognising these boundaries is essential for interpreting the findings responsibly and for guiding future inquiry.

A primary limitation stems from the cross-sectional nature of the research design. By capturing data at a single point in time, the study offers a snapshot of the relationships among MW, DI, and SC but cannot establish definitive causal pathways. For instance, while the results support the hypothesis that MW influences DI, which in turn affects SC, it is equally plausible that competitive success encourages further investment in innovation or reinforces certain leadership behaviours. Without longitudinal tracking, the temporal ordering and cyclical reinforcement of these variables remain unexplored.

Another notable limitation relates to the use of selfdata collected through structured questionnaires. Although this method is suitable for measuring perceptual constructs such as wisdom and innovation capability, it introduces potential common method bias and social desirability bias. Respondents may have been inclined to portray themselves or their organisations in a favourable light, leading to inflated scores on MW or DI. While procedural remedies such as ensuring anonymity and using validated scales were applied, the inherent subjectivity of self-reported measures remains a constraint. Triangulation with objective performance metrics, innovation output data, or third-party assessments could have added robustness to the findings.

The sample composition also imposes limitations. The study targeted managers across four broad industry sectors — Technology & IT Services, Manufacturing, Retail & Consumer Goods, and Financial Services — within a specific geographical scope. While this diversity enhances representativeness within the chosen context, it may limit the generalisability of results to other regions with distinct socio-economic, cultural, and institutional environments. For example, the conceptualisation and operationalisation of MW may vary significantly between collectivist and individualist

cultures, or between highly regulated and loosely regulated markets. Extending the sample to a multi-country dataset could yield different relational patterns, particularly in the moderation effect of DI.

In terms of model scope, the study focused on a streamlined framework involving MW, DI, and SC, deliberately excluding other potentially relevant variables to maintain parsimony. However, this choice inevitably omits additional factors that may influence the dynamics of sustainable competitiveness. Constructs such as organisational learning capability, employee empowerment, stakeholder engagement, corporate social responsibility (CSR) initiatives, and absorptive capacity have been shown in prior research to contribute significantly to competitive advantage. Their absence from the current model means that the explanatory power of R² values, though moderate-to-high, might be improved with a more comprehensive framework.

Measurement-related constraints also warrant acknowledgement. The operationalisation of MW relied on established scales derived from leadership and wisdom literature. While these instruments are validated, they may not fully capture the evolving nuances of wisdom in digital-era leadership — such as managing algorithmic transparency, navigating data ethics, or balancing human judgment with AI recommendations. Similarly, DI was measured in a way that primarily reflects technological adoption and innovation output but may not account for emerging digital transformation dimensions such as platform ecosystem participation, co-innovation with customers, or integration of sustainability objectives into technology strategies.

Furthermore, the analysis applied PLS-SEM for its suitability with predictive modelling and complex causal relationships. While appropriate for this study's exploratory nature, PLS-SEM has limitations compared to covariance-based SEM in terms of assessing global model fit and handling multivariate normality. The choice of analytical method, therefore, reflects a trade-off between predictive accuracy and certain statistical diagnostics.

Finally, the temporal and contextual relevance of the findings must be considered. The data collection occurred within a specific macroeconomic and technological climate. Rapid shifts in market conditions — such as post-pandemic recovery, supply chain disruptions, or regulatory changes in data governance — could alter the relative importance of MW and DI in driving SC. As such, while the findings are relevant at present, they should be interpreted with the understanding that strategic drivers are dynamic, and their interplay may evolve with external pressures.

Future Research Directions

Building on the contributions and limitations of this study, several avenues for future research emerge that could deepen and broaden understanding of the MW–DI–SC nexus.

First, adopting a longitudinal research design would enable the observation of how MW and DI evolve over time and how their interaction influences sustainable competitiveness in different phases of organisational growth or market turbulence. Longitudinal data could capture feedback loops, where success in SC reinforces investment in DI, which in turn may shape leadership wisdom through experiential learning. Such a design would allow researchers to distinguish between short-term and long-term effects, offering richer causal insights than cross-sectional studies.

Second, expanding the geographical scope could uncover cultural and institutional contingencies in the model's relationships. Cross-national comparative studies could investigate whether the positive moderation effect of DI on MW's impact on SC is stronger in innovation-driven economies compared to factor-driven or efficiency-driven economies. The role of national culture — for example, how high power distance versus low power distance societies interpret "wisdom" in leadership — could add depth to theoretical frameworks.

Third, future research could integrate mixed methods approaches to complement quantitative modelling with qualitative insights. In-depth case studies, ethnographic observations, or narrative interviews could reveal how leaders operationalise wisdom in digital strategy-making, how they resolve tensions between ethical imperatives and market pressures, and how innovation processes are shaped by human judgement at critical decision points.

Fourth, expanding the conceptual model to include additional mediators and moderators could yield a more holistic understanding of sustainable competitiveness. Potential mediators could include organisational learning, absorptive capacity, and CSR engagement, which may channel MW's influence toward SC through non-technological pathways. Moderators such as environmental turbulence, industry lifecycle stage, or regulatory strictness could refine understanding of the conditions under which MW and DI are most synergistic.

Fifth, objective performance metrics should be incorporated into future analyses to validate and complement perceptual measures. Linking MW and DI scores to financial indicators (e.g., return on assets, market share growth), innovation metrics (e.g., patent filings, new product launch success rates), or sustainability benchmarks (e.g., ESG ratings) could substantiate claims about competitive advantage and mitigate concerns about self-report bias.

Sixth, future work could explore sector-specific dynamics by conducting focused studies within industries where digital innovation is especially disruptive (e.g., fintech, healthtech, edtech) or in industries with longer innovation cycles (e.g., infrastructure, energy). Such studies could examine whether the mediation and moderation effects vary

depending on innovation speed, competitive intensity, or regulatory oversight.

Seventh, as artificial intelligence and automation reshape the managerial landscape, research could investigate human-machine hybrid leadership models. Questions worth exploring include: How does MW interact with AI-based decision support systems? Does algorithmic augmentation enhance or dilute the role of wisdom in strategic decision-making? Are there threshold effects where over-reliance on AI erodes human judgement, or conversely, where AI elevates the impact of wise leadership by reducing cognitive load?

Eighth, future research could test the generalisability of the dual-role finding for DI in other theoretical contexts. For example, in the realm of marketing, could customer analytics capabilities play a similar mediator—moderator role between market orientation and firm performance? This cross-domain testing could extend the hybrid capability framework beyond the management—technology interface explored here.

Finally, given the increasing focus on sustainability, it would be valuable to investigate how MW and DI jointly contribute to not only competitive advantage but also triple bottom line outcomes — economic, environmental, and social. Integrating sustainability metrics into the MW–DI–SC framework could help organisations and policymakers align competitiveness strategies with broader societal goals.

CONCLUSION

This study set out to explore how management wisdom (MW) and digital innovation (DI) interact to shape sustainable competitiveness (SC), integrating perspectives from the Resource-Based View (RBV), Dynamic Capabilities Theory (DCT), and Knowledge-Based View (KBV). The empirical results clearly demonstrate that MW and DI are not isolated strategic assets but operate in complementary and reinforcing ways to drive long-term organisational advantage.

The findings confirm that MW exerts a significant positive influence on SC both directly and indirectly through DI, with nearly half of its total effect mediated by innovation capacity. This partial mediation underscores the role of wise leadership in not only making sound strategic decisions but also in enabling the development of robust digital capabilities that translate vision into competitive outcomes. At the same time, the moderation results reveal that the value of MW is amplified in environments with higher levels of DI, reinforcing the argument that tacit, experiential knowledge and technological agility are most powerful when combined.

From a theoretical standpoint, this research contributes to the ongoing discourse on hybrid capabilities by empirically validating DI's dual role as both mediator and moderator in the MW–SC relationship. It extends RBV by positioning MW as a rare and valuable intangible resource, DCT by highlighting DI as a

dynamic enabler of adaptability, and KBV by illustrating the synergy between tacit and explicit forms of knowledge. By integrating these theoretical perspectives, the study moves beyond the often-siloed treatment of human and technological capabilities, offering a more holistic framework for understanding sustainable competitiveness in the digital era.

The managerial implications are equally significant. The results caution against over-reliance on either leadership wisdom or technological capability in isolation. Wise leaders without adequate innovation resources may be constrained in execution, while highly digitalised firms lacking wisdom risk misalignment with strategic purpose or stakeholder expectations. The study advocates for a dual investment strategy — simultaneously developing leadership that is technologically literate and ethically grounded, and building innovation infrastructures that are strategically directed.

On the policy front, the findings suggest that national and industry-level digital transformation strategies should be complemented by initiatives to cultivate ethical, foresight-driven leadership. By embedding human-centred leadership principles into innovation funding schemes, training programmes, and regulatory frameworks, policymakers can create an environment where technological advances are harnessed for sustainable and socially responsible growth.

While the study offers important insights, it also acknowledges its limitations, including its cross-sectional design, reliance on self-reported data, and geographically bounded sample. These constraints point to fertile opportunities for future research, such as longitudinal analyses, cross-cultural comparisons, mixed-method approaches, and exploration of emerging contexts like AI-driven leadership.

In conclusion, the evidence presented here affirms that sustainable competitiveness in the 21st century is not a matter of choosing between traditional managerial wisdom and cutting-edge digital innovation. Instead, it is about consciously integrating the two into a unified strategic capability. Management wisdom provides the compass, ensuring that innovation efforts are purposeful and ethically sound, while digital innovation provides the propulsion, enabling rapid adaptation and scalable impact. Organisations that can master this convergence are not only more likely to survive in turbulent markets but also to thrive — shaping competitive landscapes rather than merely responding to them.

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