

Imran, Muhammad; Hamid, Rawiyah Abdul; Ul Haque, Adnan

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Article

Driving SME Growth Through Digital Leadership: Exploring Tenure and Transformation Dynamics

Muhammad Imran ¹, Rawiyah Abdul Hamid ¹ and Adnan ul Haque ^{2,*}

¹ School of Business Management, Universiti Utara Malaysia, Sintok, Kedah 06010, Malaysia; muhammad.imran@uum.edu.my (M.I.); rawiyah@uum.edu.my (R.A.H.)

² Business and Management, Yorkville University, Concord, ON L4K 4N1, Canada

* Correspondence: ahaque@yorkvilleu.ca

Abstract: The main objective of this study is to investigate the role of digital leadership in the sustainability of SMEs. Furthermore, this study examines the mediating role of digital transformation between digital leadership and SME sustainability and the moderating role of leadership tenure on the relationship between digital leadership and digital transformation. This research provides a unique perspective by exploring these connections within the context of developing countries by considering Malaysia as a case study. We employed the structural equation modeling (SEM) technique to analyze the 368 respondents' data. The study results found a positive relationship between digital leadership and SMEs' sustainability. Furthermore, it also revealed the positive and significant mediating role of digital transformation between digital leadership and SME sustainability. Examining mediating and moderating factors provided valuable insights for SMEs and policymakers alike. Research findings contribute to both theoretical understanding and practical applications.

Keywords: digital leadership; digital transformation; leadership tenure; SME sustainability; Malaysia



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1. Introduction

In the era of artificial intelligence, the contributions of small and medium enterprises (SMEs) are getting attention from both government and business owners/managers. SMEs play a crucial role in the economic development of any country through job creation and innovation, and they also positively contribute to the total exports of their respective nations (Algan, 2019). Globally, SMEs account for 90% of job creation and GDP growth (Pedraza, 2021). Considering this, governments and SME owners/managers continually introduce the latest business strategies to adapt to evolving business dynamics. However, maintaining the performance of SMEs poses significant challenges for both governments and SME owners/managers. To address these challenges, they are adopting contemporary approaches, such as having a digital leadership view to sustain SME performance (Borah et al., 2022). Digital leadership is explained as the leaders' understanding of digital technologies, cybersecurity, and risk management, which provides information technology solutions rapidly, builds the SME capacity, and sustains the competitive advantage (Singh Chauhan & Thangavelu, 2024). This approach can particularly benefit SMEs in developing countries (Verma, 2024) like Malaysia, where SMEs cannot sustain their business for more than three to five years (Imtiaz, 2025; Kaur, 2025).

Digital leadership is considered a crucial element for any company's success. However, this is not the only factor to consider for the sustainability of SMEs. There are also many other components that must be considered, such as digital transformation and leadership

tenure. Interestingly, authentic leadership and fellowship are other important dimensions to be considered while understanding the broader role of leadership (Asghar, 2025). Digital transformation is defined as “a change in how a firm employs digital technologies to develop a new digital business model that helps to create and appropriate more value for the firm” (Verhoef et al., 2021). In simple words, the task cannot be performed without the involvement of advanced technologies. Digital transformation has become the strategic priority for organizations’ success. Hence, digital transformation can be a crucial factor for SME sustainability in terms of economic, social, and environmental perspectives (Philbin et al., 2022). This study considers digital transformation as a mediating link between digital leadership and SME sustainability to see the direct and indirect changes in this mechanism.

Moreover, leadership tenure is explained as “people who spend long period of time in their organizations, and as they succeed in climbing their organizations’ hierarchy, they tend to become more convinced of the wisdom of their organizations’ ways of doing things” (Galoji et al., 2013). Long-serving leaders have better strategic sense, which can improve their firm performance as per expectations (Madsen, 2023). Furthermore, long-serving leaders build organizations to consider the infrastructure, especially the introduction of digital technologies (Taneja, 2021). This link motivates the current study to investigate the moderating role of leadership tenure on the relationship between digital leadership and digital transformation.

Drawing the theoretical link based on dynamic capability theory (DCT) that digital leadership is considered a dynamic capability to foster the adoption of digital transformation; moreover, it enables digital transformation capability to adapt to modern technology to facilitate SMEs’ sustainability. Further, leadership tenure, as leadership experience, leverages the relationship between digital leadership and digital transformation, assuring the long-term performance of SMEs.

However, the main objective of this study is to see the direct relationship between digital leadership and SME sustainability in a Malaysian context. Secondly, another objective is to see the mediating role of digital transformation between digital leadership and SME sustainability. Nonetheless, adaptive leadership and strategic transformation are equally important (Mbarek, 2025). Lastly, another objective is to see the moderating role of leadership tenure on the relationship between digital leadership and digital transformation. As per the best knowledge of the researcher, this could be the first study under the DCT theory to investigate the combination of digital leadership, digital transformation, leadership tenure, and SME sustainability in a Malaysian context.

This study is valuable because it contributes to the specific national economy by offering details about the role of digital leadership in sustaining SMEs, using Malaysia as a case study, which was not considered previously. Most SMEs face difficulties in adopting digital technologies due to resource scarcity and lack of competence; hence, this study would be beneficial for such SMEs to ensure sustainable operations through the lens of digital leadership using tenure and transformation as moderators and mediators that have not been explored previously.

Three major dimensions through which it expands the body of existing knowledge are that it first considers the direct relationship between digital leadership and SME sustainability. Digital leadership is defined by the strategic use of digital tools to enhance operational efficiency, customer experience, and innovation. This paper identifies how leaders of SMEs can use digital competencies to overcome resource-based challenges and remain competitive. Second, it delves into the role of digital transformation as a mediator in the effect of digital leadership on sustainability. This is another new contribution to literature, as it was understudied. It incorporates advanced technologies into the business process to enable SMEs to adapt to the ever-changing market demands. It focuses on

considering digital tools as a core strategy that underlies long-term growth rather than just being a survival mechanism. Thus, this research is novel in its stance. Lastly, it has analyzed how leadership tenure moderates the relationship between digital leadership and digital transformation: a leadership tenure reflects experience and institutional knowledge, impacting adaptability and openness for innovation. It is also important to note that dynamics have social, psychological, and economic consequences (Akhter & Kaur, 2025). The use of a mediator and moderator together to examine the relationship between digital leadership and sustainability was not previously studied. Therefore, this research is novel and proposes the following research questions:

- Does digital leadership have a significant and positive link with SME sustainability?
- Does digital transformation mediate the relationship between digital leadership and SME sustainability?
- Is leadership tenure moderating the effect of digital leadership on digital transformation?

The study provides actionable insights for SME managers in enhancing resilience, policymakers in designing supportive interventions, and stakeholders in fostering innovation. This contributes to the literature by addressing digital transformation and leadership tenure, providing a framework for SME sustainability in a digital era. A significant gap has been evident regarding the leadership tenure's role in affecting the relationship between digital leadership and digital transformation, especially in the context of SMEs. Although there is growing interest among academics and scholars in transformation and digital leadership, the information at hand is one-dimensional and limited to broader industries, excluding the specificity of SMEs.

The literature at hand confirms the examination of digital transformation in businesses, yet fewer have explored the moderation effect of leadership tenure on variables of interest in the context of long-term sustainability. Few studies have examined, particularly in emerging countries' contexts, especially in Malaysia, how leadership tenure moderates the relationship. By focusing on Malaysia as a case study, this study aims to fill this gap by offering a unique perspective on ways digital leadership, digital transformation, and leadership tenure collectively contribute to SME sustainability. SMEs and policymakers in developing regions seeking to harness digital technologies for long-term success and business growth can benefit from the research's insightful findings.

The remaining sections of this research cover the literature about the proposed variables, the Methodology section, data analysis, and findings, as well as a discussion of the findings, implications, limitations, and future recommendations for the study.

2. Literature Review

In this section, the study discusses the constructs' theoretical understanding and proposes the hypothesis shown in Figure 1. Research is supported by dynamic capability theory, which suggests that firms must be able to sense, seize, and reconfigure resources and competencies in response to changing market conditions to achieve sustainable competitive advantage (Rehman et al., 2025). In other words, dynamic capability theory argues that organizations, irrespective of their size and hierarchical structure, must adapt to environmental requirements. For this, it is essential to grasp the opportunities arising from changing market conditions so that the operations are sustainable, and it helps organizations to take a substantial lead from their competitors. Additionally, leaders and managers are essential in overcoming resistance (Chahal, 2025). With respect to digital leadership, the potential capability of SMEs is considered, with digital leaders playing a significant role in sensing opportunities to utilize advanced digital technologies (Li et al., 2016). With technological advancement, thriving leaders are those who are equally competent on digital platforms. The trends are visible that SMEs often rely on digital platforms to enhance the

visibility of their operations. Thus, the digital role of leaders further escalates in the modern paradigm in the race to ensure competition through sustainability. Furthermore, digital transformation is a crucial capability because it equips SMEs with the latest technology structures to analyze new market trends and environmental changes, thereby further configuring resources to sustain the performance of SMEs overall (Ulaş, 2019). Leadership tenure, as crucial experience, is considered an important capability for SMEs; experienced leaders can make the right decisions in drastic situations because they have a sufficient understanding of the organization and its potential market (Fernández-Mesa et al., 2013; Koryak et al., 2015). Leadership styles have a distinct impact on project success (H. H. Kaur et al., 2024). However, there is no conclusive evidence that distinct leadership styles using digital platforms are equally successful in varying sectors. This further increases the essentiality of using dynamic capability theory. Hence, in simple words, DCT is the backbone of understanding this study's research framework mechanism.

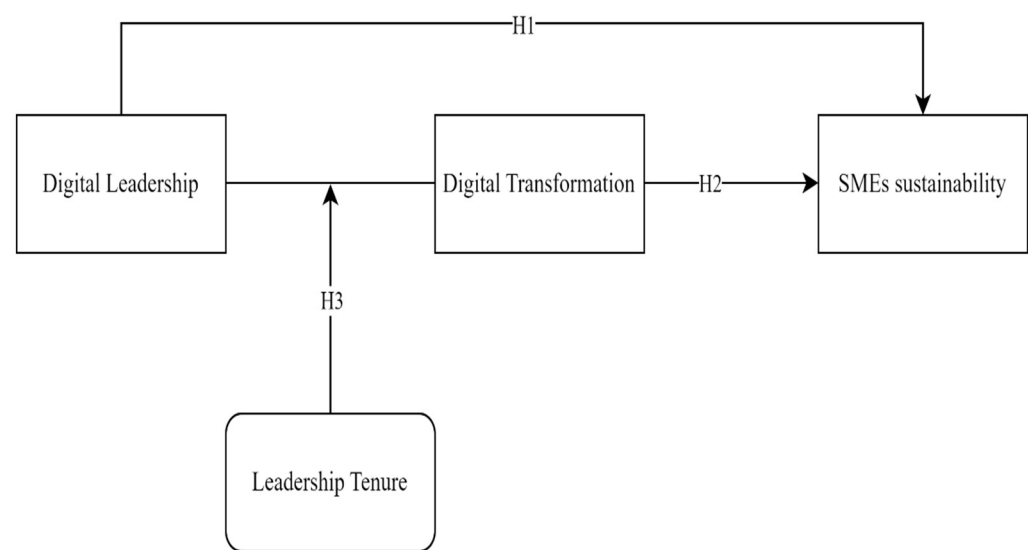


Figure 1. Research model. Source: author owns creation.

3. Relationship Between Digital Leadership and SME Sustainability

The majority of studies stated that SMEs, particularly in Malaysia, are lacking in the usage of advanced technologies. This could be a reason behind the lagging of these SMEs; however, the trends are changing, and more entrepreneurs are using digital tools and platforms for their operations. In this view, the owner/manager of SMEs is looking for innovative approaches to adopt the advanced and latest technologies (Ramayah et al., 2012). In this view, digital leadership is needed digital leadership—not just a buzzword but a lifeline for small and medium businesses. Digital leadership is all about steering a business through the tech maze, such as when the owner/manager of SMEs is navigating different social media, such as Instagram ads and online orders (Malik et al., 2024). Most SME management ditched paper receipts, started a customer loyalty app, and even launched a “bread subscription” service (Ötting et al., 2021). It was not about surviving; it was about thriving in a market. Nonetheless, strategic management through digital platforms is an essential component in the modern era (Yamoah & Haque, 2022). It is also important to note that a leader’s role is pivotal in strategic decision-making, and one such strategic move is to constructively use digital platforms to commence operations.

Furthermore, digital leaders help SMEs adopt tech, cut costs, and stay ahead of the curve. Think of it as trading a rusty old bike for an electric scooter—you still need to steer, but now you are cruising with ease. From enabling remote work to reducing waste, digital leadership blends profit with planet-friendly practices (Li et al., 2017). The critical

analysis of the rapidly changing environment is a vital aspect (Faizan, 2025). In short, digital leadership is not just for tech giants; it is the secret recipe for SME sustainability in a digital-first world. This implies that in the ever-changing competitive environment, small and medium-sized enterprises use sustainability as a weapon to sustain their position in cut-throat competition. Based on the above discussion, the following hypothesis is proposed.

H1. *Digital leadership positively affects the sustainability of SMEs.*

4. Mediating Role of Digital Transformation

As per past researchers, most SMEs struggled during the COVID-19 pandemic; either they closed their businesses or should revamp their businesses (Kuczevska et al., 2023; Rupeika-Apoga et al., 2022; Malodia et al., 2023). It is also an established fact that the COVID-19 pandemic has a severe adverse impact on small businesses, especially those operating in non-essential categories. Their operations were cut short, and as a result, many small businesses shut down. Hence, it is also an ethical dilemma to make a balanced decision without impacting various stakeholders in an adverse manner (Dadwal, 2025). Thus, most businesses have upgraded their websites and started delivering online orders to survive their business (Kuczevska et al., 2023). In simple words, this is called digital transformation (Rupeika-Apoga et al., 2022). Nonetheless, this transformation is more part of a survival strategy rather than a thriving strategy.

Research shows that digital transformation acts as the bridge between a leader's tech-savvy vision and an SME's long-term survival (Malodia et al., 2023). It is like building a strong foundation: the leader provides the vision, and digital tools make the business bloom through better customer service, smoother operations, and wider market reach. Without that tech innovation, even the most promising business ideas might struggle to survive and thrive. It might lose its competitive edge. For SMEs, embracing digital technologies to a full extent is crucial for survival and growth. Investing in technology, adapting swiftly to changes, and adopting strong digital leadership are key to navigating the evolving business landscape.

H2. *Digital transformation positively mediates between digital leadership and SME sustainability.*

5. Moderating Role of Leadership Tenure

Leadership tenure is like seasoning in a recipe—too much or too little can throw things off balance. On the one hand, long-serving leaders come with institutional memory and deep networks, making them seasoned navigators in stormy business waters. They can spot threats and opportunities like pros at a treasure hunt (Hambrick et al., 1996). But sometimes, their comfort with “how things have always been done” can slow down digital transformation—like refusing to upgrade from a flip phone. Newer leaders, on the other hand, often arrive with fresh perspectives and a hunger for innovation. They are like the new chefs eager to experiment with bold flavors. The downside? They may lack the wisdom that comes from weathering past storms and could fumble with complex business dynamics (Quigley & Hambrick, 2012).

For SMEs, leadership tenure can be both a blessing and a curse. Long-tenured leaders may resist change, clinging to old ways, while newer leaders might charge ahead without fully grasping the bigger picture (Ferreira et al., 2014). Interestingly, research shows mixed results on whether leadership tenure makes or breaks business success. Some studies suggest it is not the years on the job that counts but the ability to adapt and keep learning (Hambrick & Fukutomi, 1991). It is less about how long you have been in the driver's seat and more about how willing you are to upgrade your navigation system. Future research

could explore how leadership development programs and succession planning can help balance tenure with digital transformation goals for sustainable SME growth.

H3. *The leadership tenure positively moderates the relationship between digital leadership and digital transformation.*

Theoretical Linkage of the Study

The dynamic capability theory (DCT) supported this research framework; digital leadership is treated as a dynamic capability that can sense and seize opportunities for their organizations; in return, digital leadership can successfully implement the digital transformation strategy. Furthermore, digital transformations are considered a capability for SMEs to bring sustainable performance to SMEs by utilizing advanced technologies. Moreover, leadership tenure is also considered a dynamic capability to improve the approaches of leaders to bring and improve the digital structure of the organizations.

6. Methodology

As per SME Corporation Malaysia, the total micro, small, and medium enterprises account for 96.9% of total businesses. Nonetheless, 30.3% are SMEs in total businesses in Malaysia (SMECorp, 2023). The digital-oriented SMEs are 35% of the total 334,304 SMEs (Economic Planning Unit, 2021). The sample framework is acceptable, while in social science research, the evidence is that if the total population is over 10,000, then 10–30% is acceptable. In the present case, we have 35% representation, which is highly acceptable Raosoft (n.d.). On this behalf, this study has collected data using a convenience sampling strategy. We accept that convenience sampling is often viewed with skepticism, but it is one of the popular methods when the sample framework is large and researchers are prioritizing the convenience of respondents (Alshebami, 2024). As per the Raosoft sample size calculator, considering a margin of error of 5%, a response distribution of 40%, and a 95% confidence interval, and assuming 35% of the 334,304 SMEs population of 117,006 digital-oriented SMEs. The present study's actual sampling frame considered 117,006 SMEs, and the minimum sample size of 368 is required as per the Raosoft sample size formula Raosoft (n.d.). The details of the sample as per business type can be seen in Table 1. However, this study has targeted 1000 SMEs for data collection to achieve the required sample size. Nonetheless, the current study recorded the response rate at 36.8%.

Table 1. Sample description.

Type of Business	Size of Business	No of Employees	Total No
Retail	Small	Above 5	54
Food and beverages	Micro	Less 5	88
Services	Small	Above 5	107
Automotive	Small	Above 5	66
Beauty and personal care	Small	Above 5	25
Telecommunication	Small	Above 5	28

The size of the business was identified using the number of employees criteria, as per Malaysia (Malaysia, 2013).

Understanding the wider effects of digital leadership and change on companies of all sizes requires gathering data from micro and small entrepreneurs, particularly as these companies are the foundation of many economies. Particularly in developing nations, micro and small businesses (MSEs) are frequently the most prevalent commercial entities. They are essential to economic growth, employment creation, and poverty reduction. For instance, in Malaysia, SMEs employ a sizable share of the labor force and contribute significantly

to the country's GDP. Through the collection of information from these business owners, this research offers insightful information on the unique possibilities and difficulties they encounter while using digital leadership techniques. Additionally, because micro and small firms often have limited resources and encounter particular challenges throughout the digital adoption process, it is crucial to comprehend the link between digital leadership, digital transformation, and sustainability within these organizations. They provide insights that are vital for policymakers seeking to promote inclusive economic growth, and their inclusion in this study serves to illustrate how digital leadership can assist even the tiniest enterprises to achieve sustainability and compete in a digital economy.

6.1. Scale of the Study

The study utilized a structured questionnaire to measure various dimensions related to SMEs. The sustainability of SMEs was assessed using a 6-item scale adopted from the research conducted by [Chege and Wang \(2020\)](#). To evaluate digital leadership, a 6-item scale from the study by [Meier et al., 2017](#) was employed. Leadership tenure was measured using a 3-item scale derived from the study of [Lajoie et al. \(2017\)](#). Additionally, the concept of digital transformation was examined through a 3-item scale, which was adopted from the study by [Zhang et al. \(2023\)](#). The details of the scale can be seen in Appendix A. These scales were carefully selected based on their relevance and prior validation in the respective studies, ensuring reliability and accuracy in measuring the intended constructs. By incorporating these well-established tools, the study aimed to gather precise and comprehensive data on the factors influencing SMEs' sustainability, digital leadership, leadership tenure, and digital transformation processes.

6.2. Data Analysis

The partial least structural equation modeling technique has been adopted to evaluate the primary data of the study. In this regard, smartPLS-4 has been employed to validate the measurement and structural model.

6.3. Measurement Model

This model is also called the outer model. This model validated the composite, convergent, and discriminant validities of the constructs. The value of composite validity should be more than and equal to 0.5; hence, the current study achieved the threshold value; the result can be seen in Table 2. Moreover, the values of convergent or average variance extracted (AVE) values should be more equal or more than 0.50 ([Hair et al., 2021](#)); thus, this study also achieved the threshold values for AVEs of the construct, as findings can be observed in Table 1 and Figure 2. In respect of discriminant validity, we adopted the Heterotrait–Monotrait ratios (HTMT) to verify the validity of the constructs. The HTMT values should be less than 1.0 ([Hair et al., 2021](#)); thus, the current study discriminant validity values were found to be less than 1.0; the results can be seen in Table 3.

Table 2. Composite and convergent validity values.

Constructs	Composite Reliability (rho_a)	Composite Reliability (rho_c)	Average Variance Extracted (AVE)
DL	0.943	0.954	0.774
DT	0.784	0.756	0.567
LT	0.668	0.770	0.528
SMESUS	0.902	0.917	0.649

Note: DL (digital leadership), DT (digital transformation), LT (leadership tenure), SMESUS (SME sustainability).

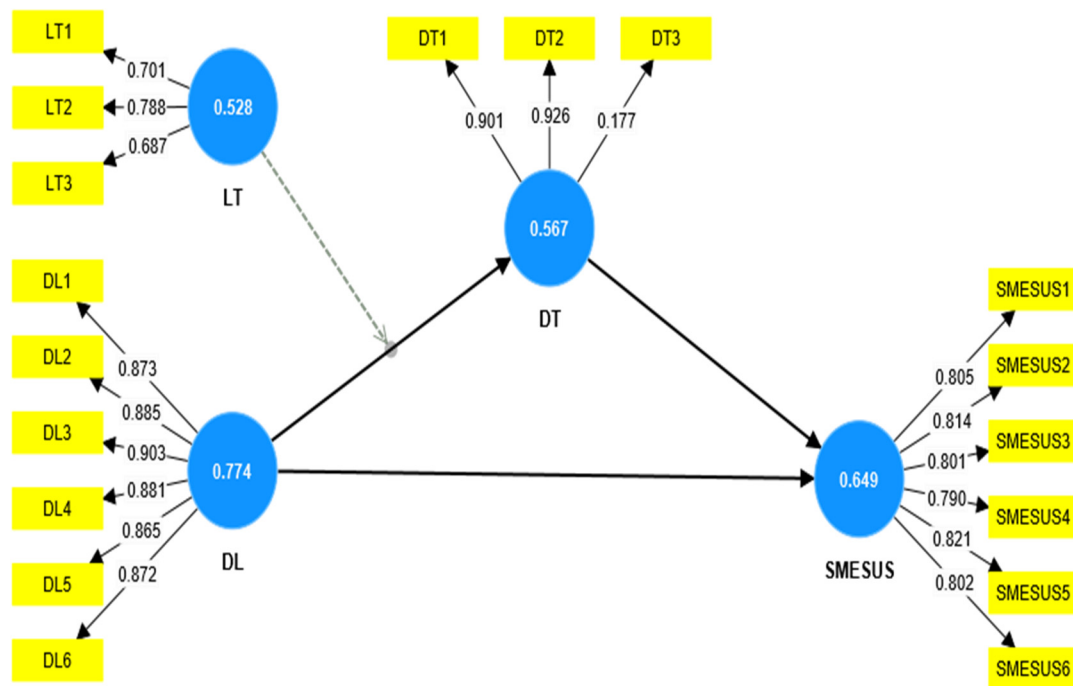


Figure 2. Measurement model.

Table 3. HTMT ratios.

Constructs	DL	DT	LT
DL			
DT	0.585		
LT	0.465	0.959	
SMESUS	0.477	0.420	0.402

Note: DL (digital leadership), DT (digital transformation), LT (leadership tenure), SMESUS (SME sustainability).

6.4. Variance Inflation Factor

As per [Hair et al. \(2021\)](#), the VIF values should be less than 5.0; hence, as per Table 4 findings, all items' VIFs are observed under the threshold values. Thus, no multicollinearity issues were found.

Table 4. VIF.

Items	VIF
DL1	3.778
DL2	3.842
DL3	4.012
DL4	3.345
DL5	3.173
DL6	3.061
DT1	1.975
DT2	1.982
DT3	1.006
LT1	1.163
LT2	1.169
LT3	1.136

Table 4. *Cont.*

Items	VIF
SMESUS1	2.079
SMESUS2	2.168
SMESUS3	1.85
SMESUS4	2.15
SMESUS5	2.365
SMESUS6	2.252

6.5. Common Method Biase

This study has used a single-factor method to evaluate CBM. As per Podsakoff et al. (2003), the single-factor value should be less than 50%; however, the current study found 36.82%, which is less than the threshold value. The results can be seen in Table 5. Hence, no CBM issue exists in this study.

Table 5. Common method bias (CMB).

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.627	36.817	36.817	6.627	36.817	36.817
2	2.422	13.458	50.275			
3	2.079	11.552	61.827			
4	0.988	5.486	67.313			
5	0.801	4.449	71.763			
6	0.747	4.152	75.914			
7	0.675	3.751	79.665			
8	0.549	3.050	82.715			
9	0.467	2.594	85.309			
10	0.448	2.490	87.800			
11	0.404	2.246	90.046			
12	0.372	2.065	92.111			
13	0.323	1.794	93.905			
14	0.284	1.575	95.480			
15	0.245	1.363	96.844			
16	0.217	1.204	98.048			
17	0.178	0.990	99.038			
18	0.173	0.962	100.000			

Extraction method: principal component analysis.

6.6. Model Fitness

For the model fitness, this study has used the standardized root meaning square residual (SRMR) and normed fit index. The values of SRMR should be less than 0.08; hence, in the present study, SRMR saturated and estimated values were recorded at 0.066 and 0.068 under 0.08. On the other hand, the values of the normed fit index (NFI) should be more than 0.80–0.90; hence, this study found the NFI both saturated and estimated values between 0.841 and 0.40 within the threshold values, respectively. The results of SRMR and NFI can be seen in Table 6.

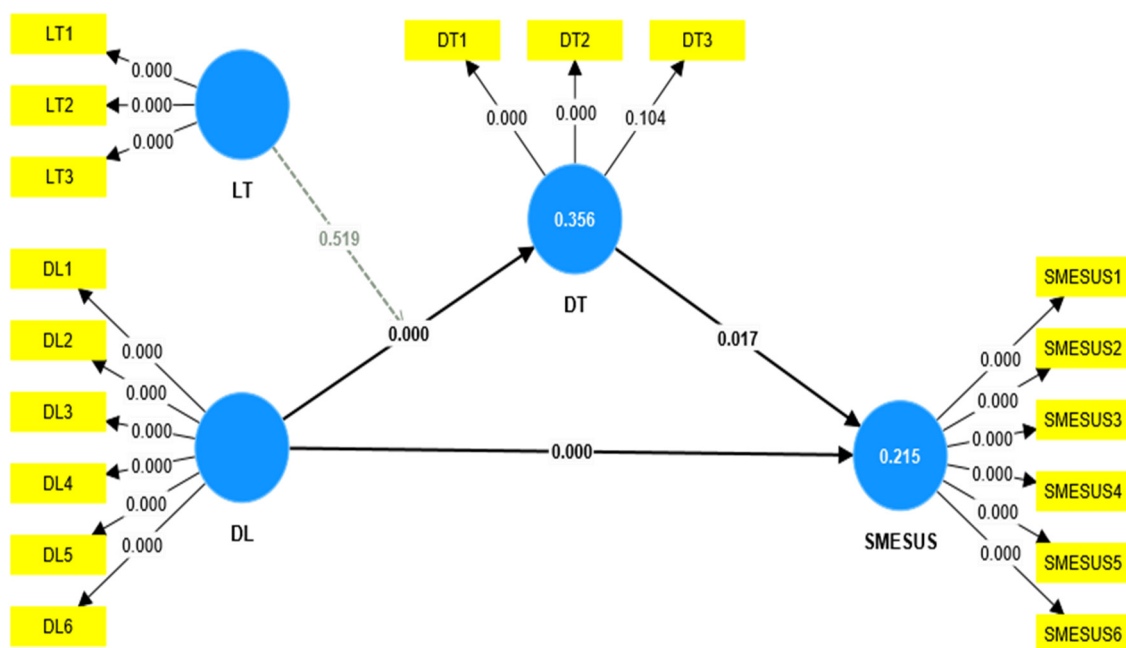
Table 6. Model fitness indices.

Indices	Saturated Model	Estimated Model
SRMR	0.066	0.068
NFI	0.841	0.84

Note: SRMR (standardized root mean square residual), NFI (normed fit index).

6.7. Structural Model

This model is used to verify the relationship between constructs. In this regard, this model has used the path coefficient model to reveal the findings of the study. Basically, the path coefficient using the bootstrapping technique at 1.96 t-values and 0.05 *p*-value to confirm the relationship between constructs and the findings of the proposed hypothesis in the limit t-statistics and *p*-values can be seen in Table 4 and Figure 3. As per Table 7, H1 and H2 were accepted; on the other hand, H3 did not meet the criteria and hence was rejected.

**Figure 3.** Measurement model.**Table 7.** Findings of the study.

Hypothesis	Beta	Standard Deviation	T-Statistics	<i>p</i> -Values	Decision
H1: DL -> SMESUS	0.432	0.044	9.861	0.000	Supported
H2: DL -> DT -> SMESUS	0.036	0.017	2.125	0.034	Supported
H3: LT x DL -> DT	−0.026	0.041	0.645	0.519	Not Supported

Note: DL (digital leadership), DT (digital transformation), LT (leadership tenure), SMESUS (SME sustainability).

Furthermore, with respect to mediation type, this study used Zhao et al.'s (2010) approach and used Figure 3 to identify the type of mediation. As per the findings of hypothesis 2, it was the complementary mediation (partial mediation).

6.8. Discussion of the Results

The study found a positive and significant relationship between digital leadership and SME sustainability in the Malaysian context; hence, hypothesis 1 is accepted. This finding is also consistent with the study of Lathabhavan and Kuppusamy (2024), which

also found that business sustainability is further strengthened and promoted by digital leadership, hence confirming that it plays a vital role for business, irrespective of size and type. In addition to that, the positive impact of digital leadership could also be attributed to the ability of a leader to guide SMEs through challenging times, especially in the era of digital technological complexities, nurturing an environment that continues to embrace and encourage innovation, improved customer service, and maintain competitive edge in dynamic markets. It is confirmed that our findings are consistent with the broader literature on digital leadership, which indicates that digital leadership effectiveness is vital for achieving long-term growth and sustainability in the constantly changing business environment. In other words, sustainability in a VUCA (volatile, uncertain, complex, and ambiguous) environment.

The mediating role of digital transformation between digital leadership and SME sustainability was observed to be both positive and significant in this study. This finding confirms the acceptance of hypothesis 2, which proposed such a relationship.

The study demonstrated that digital transformation partially mediates the relationship between digital leadership and sustainability. This suggests that while digital leadership directly impacts SME sustainability, its full potential is realized when combined with the strategic integration of digital transformation. This finding aligns with the work of previous researchers who emphasize the synergistic relationship between leadership and digital transformation in enhancing business sustainability. It could also be narrated from the results at hand that the analysis demonstrated that digital transformation plays a partial mediating role in the relationship between digital leadership and SME sustainability. This implies that digital leadership not only has a direct impact on the sustainability of SMEs but also influences it indirectly through the processes and strategies associated with digital transformation. In other words, the integration of digital transformation amplifies the effectiveness of digital leadership in achieving sustainable outcomes for SMEs. To put it simply, digital leadership becomes more impactful and influential when supported by digital transformation approaches, which enhances the ability of SMEs to maintain and improve their performance over time in a competitive and ever-changing business environment.

The digital transformation's mediating effect being significant also indicates that the role of digital leadership is not only confined to providing just a vision but also ensuring that active involvement is demonstrated in guiding SMEs through the process of adopting digital tools and strategies because the guidance would enable long-term sustainability. In this sense, for the transformation, digital leadership becomes a catalyst in the process by allowing SMEs to exhibit the full potential of digital technologies in order to maintain a competitive edge. This finding reinforces the growing recognition in the literature that digital transformation is essential for SMEs to adapt and thrive in the digital age. In other words, digital transformation is a critical enabler of sustainable growth. However, employees' performance must be examined over time (Daneshvar, 2025; H. Kaur & Haq, 2025).

On the other hand, the moderating role of leadership tenure on the relationship between digital leadership and digital transformation is found to be insignificant; thus, hypothesis 3 is not supported by this study. Interestingly, our present finding opposes to a larger extent the existing literature that argued that longer leadership tenure could have a greater positive impact, especially in understanding the organization, and offer far greater stability in the process of decision-making, which facilitates the adoption of digital transformation (Yamoah & Haque, 2022; H. Kaur et al., 2024). There is no role for leadership tenure in implementing the digital transformation; studies show that leadership ability is crucial to executing the digital transformation strategy in organizations rather than their long service (Henderikx & Stoffers, 2022). In other words, this study can say that new and

experienced leaders can implement digital transformation successfully without any hazards if they have digital leadership skills. Nonetheless, present findings show that the critical factor is the digital competencies of a leader in the successful implementation of strategies in the SMEs rather than the duration of leadership. In addition to that, skills and the ability to adapt to changing environments and changing technologies are also vital factors behind a leader's success in bringing change to the organization and adapting to technological changes. This conclusion is supported by research from [Ulaş \(2019\)](#), [Koryak et al. \(2015\)](#), [Malik et al. \(2024\)](#), and [Yamoah and Haque \(2022\)](#), who found that digital leadership skills are more pivotal for effectively managing technological and strategic change.

The mediating role of digital transformation between digital leadership and SME sustainability was observed to be both positive and significant in this study. This finding confirms the acceptance of hypothesis 2, which proposed such a relationship. Furthermore, the analysis demonstrated that digital transformation plays a partial mediating role in the relationship between digital leadership and SME sustainability. This implies that digital leadership not only has a direct impact on the sustainability of SMEs but also influences it indirectly through the processes and strategies associated with digital transformation. In other words, the integration of digital transformation amplifies the effectiveness of digital leadership in achieving sustainable outcomes for SMEs. To put it simply, digital leadership becomes more impactful and influential when supported by digital transformation approaches, which enhances the ability of SMEs to maintain and improve their performance over time in a competitive and ever-changing business environment. On the other hand, the moderating role of leadership tenure on the relationship between digital leadership and digital transformation is found to be insignificant; thus, hypothesis 3 is not supported by this study. There is no role for leadership tenure in implementing the digital transformation; studies show that leadership ability is crucial to executing the digital transformation strategy in organizations rather than their long service ([Henderikx & Stoffers, 2022](#)). In other words, this study can say that new and experienced leaders can implement digital transformation successfully without any hazards if they have digital leadership skills.

7. Conclusions

The conclusion drawn from the results and findings is that the sustainability of SMEs is driven by the exemplary role of digital leadership in Malaysia. In other words, it is concluded from the statistical analysis that the role of digital leadership is significant in creating sustainability for SMEs. The relationship between digital leadership and SME sustainability has been confirmed to be statistically positive and significant, which supports the previous empirical studies to a certain extent. In addition to that, the moderating role of leadership tenure and the mediating role of digital transformation were examined in this research. Interestingly, it is concluded that digital transformation partially mediates the relationship between digital leadership and the sustainability of SMEs. Therefore, it is pivotal to improve the role and visibility of digital leadership to ensure the sustainability of SMEs. Nonetheless, our findings revealed that the moderating role of leadership tenure in the relationship between digital leadership and digital transformation is insignificant. This indicates that leadership ability, rather than tenure, is key to successfully implementing digital transformation strategies. The findings collectively highlight the necessity of fostering digital leadership capabilities and leveraging digital transformation approaches to sustain SMEs' performance, irrespective of leadership experience.

7.1. Implications of the Study

7.1.1. Theoretical Implications

The literature on digital leadership, digital transformation, and SME sustainability is expanding, and this research adds to it, especially when considering emerging nations like Malaysia. A more sophisticated explanation of the relationship between digital leadership and SME sustainability is offered by this study, which incorporates leadership tenure as a moderating component and digital transformation as a mediating variable. In contrast to other research that mostly focuses on major corporations, this study adds to the theoretical conversation by highlighting the function of digital leadership in settings with limited resources, including micro and small businesses. The results cast doubt on the conventional wisdom that longevity in leadership is a determining factor in digital transformation, arguing that digital proficiency and adaptability are more important than tenure. Additionally, by showing that digital leadership improves company sustainability both directly and through digital transformation, this study adds to and validates ideas of technology adoption and leadership. These results provide a theoretical framework for further research into the dynamics of leadership and digitalization in various sectors and geographical areas.

7.1.2. Practical Implications

Furthermore, with the digital transformation—upgrading from an old flip phone to the latest smartphone—everything runs smoother. Investing in modern technology, automating repetitive tasks, and letting data guide decisions is not just smart; it is essential. Owners, Managers, and policymakers should focus on digital transformation due to its potential benefits. Furthermore, they should offer incentives and expert guidance to get more businesses on board. Go green, save resources, and adopt eco-friendly tech.

This study suggests that owners/managers of SMEs utilize the digital leadership approach to sustain their business performance in the long run. This study not only stresses long-run financial performance; this digital approach can also bring environmental sustainability as well, which is not only important for SMEs but also for the whole society's survival. Digital leadership, through high confidence and capabilities in a fast-changing environment, can be useful in controlling the consumption of raw materials, water, and energy by SMEs. Furthermore, digital leaders can utilize advanced digital technologies to control emissions such as greenhouse gases and other dangerous gases. SMEs in Malaysia need to sharpen their digital leadership skills like chefs perfecting their signature dishes. Continuous training and development are not just buzzwords; they are survival tactics in a digital-first world.

For SME owners, managers, and legislators looking to improve corporate sustainability through digital leadership, this report offers useful insights. The results highlight how entrepreneurs must actively embrace digital leadership techniques and use digital transformation tactics to be competitive in a market that is changing. Because leadership tenure was determined to be negligible, SME owners, regardless of experience level, should prioritize learning digital skills above traditional leadership expertise. Policymakers should develop programs to encourage digital upskilling, provide financial incentives for adopting modern technologies, and provide frameworks that make it easier for SMEs to digitize. Furthermore, leadership training that encourages SME leaders' creativity, adaptability, and digital literacy must be given top priority in company growth initiatives. This study also emphasizes the significance of having access to digital resources and infrastructure, which may help SMEs successfully adopt digital strategies and eventually support long-term sustainability and economic resilience in developing nations.

7.2. Limitations and Future Recommendations

This study also has limitations, such as being conducted in the context of SMEs in Malaysia, which limits its generalizability to other regions. The future should consider other sectors and other countries' comparative studies. This study has collected cross-sectional data; the future study can collect longitudinal data to generalize the findings. Furthermore, future studies can consider the organizational culture as a moderating variable in the existing research model.

Due to time constraints, we did not assess the relationship between digital leadership and digital transformation. This would have provided interesting insight; however, this serves as a foundation for future studies to consider. Future researchers are suggested to consider exploring the direct relationship between digital leadership and digital transformation. This could help future studies by unearthing some new insights into research variables.

The sampling technique (method to gather data) is weak in this study, so future researchers shall consider a more rigorous approach for sample selection. It would be better to combine different sampling methods to avoid over-reliance on a single technique. The focus of this study is on mathematical objectivity, though it is acceptable in social science research, but the qualitative perspective is missing. Hence, the hidden embedded truth could not be attained. Future studies shall consider qualitative perspectives by conducting in-depth interviews with experts to understand interlinked themes and trends so that research phenomena can be further explored.

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Appendix A. Scale of Study

Digital Transformation ([Zhang et al., 2023](#))

1. Our firm is driving new business processes built on technologies such as big data, analytics, cloud, mobile, and social media platforms;
2. Our firm is integrating digital technologies such as social media, big data, analytics, cloud, and mobile technologies to drive change;

3. Our business operations are shifting toward making use of digital technologies such as big data, analytics, cloud, mobile, and social media platforms.

SME sustainability (Chege & Wang, 2020)

1. “Our company minimizes its consumption of resources (raw materials, water, and energy)”;
2. “Our company protects biodiversity and protected areas”;
3. “Our company minimizes its emissions into the air (greenhouse gases and other substances)”;
4. “Our company minimizes its releases into the water”;
5. “Our company minimizes residual materials”;
6. “Our company minimizes the environmental impact of its products”.

Digital Leadership (Meier et al., 2017)

1. “The leader in our company recognizes the network character by identifying the competencies and contacts of individual employees”;
2. “In our firm, leaders develop trust in the employees”;
3. “In our firm, leaders provide necessary information to employees”;
4. “In our firm, leaders act as learning guides and coaches”;
5. “Leaders are open to critique, feedback and new ideas”;
6. “Leaders have high confidence in the capabilities because of the fast-changing environment”.

Leadership tenure (Lajoie et al., 2017)

1. The leader has demonstrated a consistent ability to achieve organizational goals during his/her tenure;
2. The leader has created a motivating work environment throughout their leadership period;
3. The leader has shown adaptability when addressing challenges during his/her tenure.

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