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Digital Communication Systems and Organizational Agility: Examining the Digital Preparedness and Sustainability of Malaysian MSMEs in a Dynamic Environment

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Abstract

Micro, small, and medium-sized enterprises (MSMEs) have substantial difficulties in corporate digital settings. The companies have digitalized their operations and enhanced their digital agility via digital communication and technology. This study examines Malaysian MSMEs' long-term viability through a digital communication system (DCS) with digital connections in the downstream and upstream sectors. This study investigates the preparedness of 192 Malaysian MSMEs to handle digital disruption and their ability to adapt and respond quickly to organizational changes. However, statistics disprove the idea that DCSs affect MSMEs' organizational agility. Research shows that DCSs improve organizational agility in uncertain environments. This improved methodology emphasizes DCS's conditional outcomes to highlight MSMEs' digital challenges in dynamic external environments. We recommend further investigations on conditional implications to clarify past inconclusive findings. This study sheds light on the digitalization process between MSMEs and organizations and adds to the richness of literature on the context and success of digital strategies. It also examines the complex relationship between digital platforms, digitization, and the instability of the MSMEs environment. The results show that sustainable businesses should be aware of digitalization in terms of their business conditions and environments.

Keywords: *Digital Communication Systems - DCSs, Digitalization, Digital disruption, MSMEs, Business Sustainability*

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INTRODUCTION

Digital technology has significantly transformed the corporate environment in recent decades. The current work environment and culture have posed difficulties for micro, small, and medium enterprises (MSMEs), particularly in addressing digital disruption. This is a regular occurrence for MSMEs that conduct their operations using digital technology and sophisticated communication networks (Azeem et al., 2021; Bagale et al., 2021). Digital connectivity through digital communication systems (DCSs) affects MSMEs' long-term viability in upstream and downstream sectors. Implementing a DCS may significantly impact an organization's ability to adapt and respond quickly to digital disruption. Prior research has also examined how MSMEs adjust to digital transformation within changing external circumstances (Azeem et al., 2021).

In recent years, digital ecosystems have transformed business. The rapid advancement of technology and the Internet have made digital communication systems essential for stakeholder connectivity and interaction (Nasidi et al., 2022). E-commerce marketplaces and social media networks are complex digital ecosystems that exchange goods, services, and information (Chawla et al., 2021). It is believed that this evolution can alter the business model and present new opportunities for the involved MSMEs. This digital communication system is actually able to help MSMEs improve their customer reach, process efficiency, and competitiveness. MSMEs must wisely navigate this digital ecosystem and adapt their strategies to succeed in the ever-changing business environment (Bican et al., 2020).

To develop MSMEs' progress in response to digital disruption, digital communication systems must increase digitization and flexibility in their workflows (Combs et al., 2023). Due to the better affordability and accessibility of digital technology is more affordable and accessible, MSMEs can use this communication system to connect with customers, suppliers, and partners. They can enhance their operations, penetrate new markets, and foster more cooperation (Guimarães et al., 2021). A digital communication system helps MSMEs grow faster and become more competitive. MSMEs can connect, collaborate, and innovate using digital communication systems. This is important to cope with the rapidly changing market conditions and customer expectations in a dynamic business landscape (Azeem et al., 2021).

SIGNIFICANCE OF STUDY

A study of the impact of digital communication systems on MSMEs in a dynamic business environment is important for various reasons. First, it is able to shed light on MSME digitization strategies to adapt to digital disruption (Bican et al., 2020). The long-term viability of SMEs depends on understanding how they navigate the digital environment and use digital communication systems to improve organizational agility. Furthermore, we need to investigate whether the conditional impacts of digital communication systems can clarify the intricate connection between digitization and digital disruption. The performance of DCSs (Distribution Channel Systems) and MSMEs (Micro, Small, and Medium Enterprises) is moderated by this digital disruption; readings in the existing supply chain digitization literature suggest that convincing measures are necessary (Eniola et al., 2015). Published studies on the benefits of digitization for MSMEs are scarce (Cenamor et al., 2019; Matarazzo et al., 2021), with even fewer examining and emphasizing the need for a deeper understanding of MSMEs' use of digital technologies and communication systems. Therefore, the research questions are:

RQ1. To what extent do DCSs affect Organizational Agility?

RQ2. How does digital disruption affect the relationship between DCSs and Organizational Agility?

This research identifies contextual factors that affect digital strategy outcomes to help customize business digitization strategies. Assessing the impact in a changing business environment helps MSMEs develop digital-age strategies.

LITERATURE REVIEW

Understanding Digital Communication Systems

Using digital technology and effective communication systems, DCSs can connect MSMEs with other businesses and supply chain actors. Customers and end users move downstream, whereas suppliers and other value chain partners move upstream. MSMEs can use downstream connections to attract customers, enter new markets, and gain a better understanding of product development to benefit consumers. However, it is important to have the ability to handle inventory effectively by engaging in productive partnerships with suppliers and developing profitable sales and connections by improving upstream operations (Guimarães et al., 2021). We also expect MSMEs to gain significant advantages from digitization by maximizing the use of DCSs. This allows them to change their business model for the better and achieve a high return on investment (ROI). In addition, MSMEs can maintain competitiveness by acquiring and managing a large market share through new ideas and effectively adapting to environmental changes through DCSs.

Definition and Characteristics of Digital Communication System

A digital communication system integrates digital communication systems and technologies to improve communication and collaboration. It simplifies business, customer, supplier, and stakeholder interactions with e-commerce marketplaces and social media (Barrane et al., 2020). The DCSs help MSMEs grow, improve, and engage customers with digital tools and services. It connects MSMEs to more customers, partners, and suppliers, boosting growth and innovation (Loo et al., 2023). MSMEs can use the DCSs to gather data and insights that will help them make informed decisions and adapt to market changes. Khan et al. (2023) say the DCSs help MSMEs collaborate, connect, and grow online.

Examples of popular communication systems used by MSMEs

MSMEs can use communication apps like Shopify, WooCommerce, and BigCommerce as optimal business platforms. This platform facilitates the construction and administration of this enterprise's online storefront. Communication technology effectively oversees inventory, payment, and customer affairs, enabling small firms to manage more efficiently (Nyagadza, 2022). They can expand their user database and increase internet visibility. SMEs should increase the promotion of their goods and services to engage customers by using social media platforms such as Facebook, Instagram, and LinkedIn (Crittenden et al., 2023). This communication system enables MSMEs to generate more focused marketing, engage with consumers through positive messages and continuous product evaluations, and create a strong brand community with a more trusted image and reputation. This communication system will increase viable digital visibility,

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resulting in better consumer reach and enhanced performance for MSMEs businesses (Chawla et al., 2021).

Benefits and challenges of adopting DCSs

The implementation of DCSs has many benefits for MSMEs, but it also presents many challenges. DCSs helps MSMEs reach and gain more customers, increase market value, and compete healthily in the digital economy (Kurniawan et al., 2022). Integration into a diverse communication system allows MSMEs to access new business prospects, collaborations, and networks that enable them to improve product offerings and customer experiences. (Barrage et al., 2020). MSMEs can also get a fantastic opportunity with the implementation of DCSs (Olazo, 2022). This includes reducing data security and privacy issues, technological infrastructure and expertise requirements, and excessive reliance on specific communications systems. (Gozman & Willcocks, 2019). Although these challenges are burdensome, DCSs can help MSMEs thrive and compete in a dynamic business environment and landscape (Barrane et al., 2020).

The Role of DCSS in MSMEs' Sustainability

MSMEs need DCSs to survive today's business environment. MSMEs can improve agility and address digital disruption. Interestingly, DCSs do not directly affect MSMEs' organizational agility. However, this study emphasizes DCS's role in disrupting organizational agility. Digital disruption complicates the relationship between digital communication systems and organizational agility. This study emphasizes DCS's contingent impacts and the need for a customized and contextually aware business digitization strategy to help MSMEs survive in ever-changing environments. DCSs may hurt MSMEs. A hypothesis is proposed.

H1. Digital Communication Systems have a negative effect on Organizational Agility in MSMEs.

Overview of MSMEs' Challenges in a Dynamic Business Environment

MSMEs face many challenges in a fast-changing business environment. Global competition, technological advances, and changing market conditions threaten these companies' survival and growth. MSMEs struggle due to limited human and financial resources (Mittal & Raman, 2021). Micro, small, and medium enterprises (MSMEs) struggle to adopt new technologies due to their limited digitalization knowledge. MSMEs struggle in a volatile business environment with geopolitical instability, regulatory changes, and economic fluctuations. MSMEs must be agile, adaptable, and innovative to succeed in this complex environment (Linnenluecke & McKnight, 2017).

The Impact of DCSS on MSMEs' Organizational Agility

To improve their business agility, MSMEs are digitizing organizations with digital communication systems. However, the long-term and short-term impacts of digital communication systems on organizational agility during digital disruption remain unpredictable. Unlike popular belief, this digital communication system may not directly affect the agility and stability of any MSMEs organization. Digital disruption has an impact on organizational agility, complicating the relationship between digital communication systems and agility. The digital communication system improves organizational agility in chaos. MSMEs need a customized and situation-specific digital communication system strategy to navigate the digital environment and sustain business.

Contradictory findings in prior studies and the need for further exploration

Research on the significant impact of digital communication systems (DCSs) on the agility of small and medium enterprise organizations has been inconsistent and warrants further investigation. DCSs may improve performance in some studies, but it may not improve in others. There are inconsistencies when it comes to identifying subtle moderating factors for DCSs. Therefore, future research should examine this conditional effect to determine the contextual factors that influence the outcome of an organization's digital strategy. This approach helps MSMEs understand supply-chain digitalization and create more efficient and customized business digitization strategies in dynamic environments.

The Influence of Digital Disruption on MSMEs' Digitalization Strategy

Digital disruption is critical to SMEs' digitization. SMEs must adapt and thrive in an increasingly unpredictable and volatile business environment. SMEs must adapt to changing market conditions, so digital disruption affects their digitization strategy. SMEs prioritize digital communication systems in an uncertain environment for organizational agility and competitiveness. Digital disruption impacts MSME digitization strategies, highlighting the importance of contextual factors in digital strategy outcomes. It emphasizes the need for customized business digitization.

H2. Digital disruption positively moderates the relationship between a Digital Communication System and a firm's Organizational Agility.

Definition and Factors Contributing to Digital Disruption

From the outside, digital disruption occurs quickly and unpredictably in business environments, impacting organizations. These characteristics include innovation, competition, market volatility, and regulatory and socio-political change. Digitization and digital communication systems have the potential to change business models and present new challenges. Businesses face uncertainty due to international competition, changing consumer preferences, global economic uncertainty, and geopolitical instability. Understanding and managing this digital disruption can improve strategic decisions, resource allocation, innovation, and business sustainability, especially for SMEs.

The Relationship between Digital Disruption and MSMEs' Digitalization Efforts

Hence, comprehending the phenomenon of digital disruption and the digitalization endeavors undertaken by micro, small, and medium enterprises (MSMEs) is crucial for enhancing a firm's long-term viability (Amornkitvikai et al., 2022). In a dynamic business environment, MSMEs can face many challenges caused by high external and internal disturbances. Therefore, these companies mobilize efforts to digitize their organizations using the best digital technology and communication systems. However, we still need to debate the impact of digital disruption on MSMEs' digitization. Some researchers stated that MSMEs should be more inclined to digitize for survival and adaptation in an uncertain environment (O'Kane et al., 2019). Digital disruption can hinder the digitization of MSMEs due to uncertainty and risk in uncertain conditions. Therefore, we need to conduct further research on digital vulnerabilities to understand the impact of these disruptions on MSMEs' digitization efforts and to effectively navigate the unpredictable environment. DCSs combines various parties and

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operations, promotes transparency, and analyses and generates knowledge (O'Kane et al., 2019).

H3. Channel disruption positively moderates the relationship between a Digital Communication System and a firm's Organizational Agility.

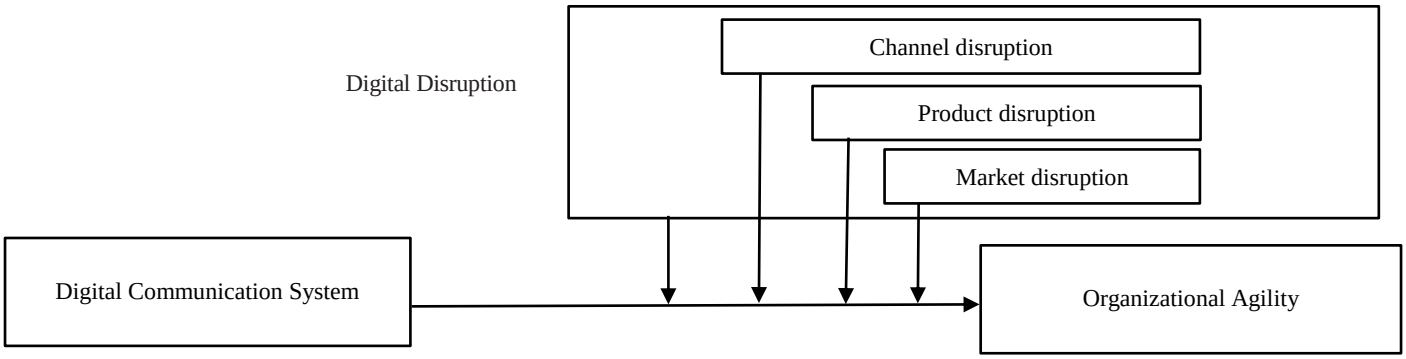
More and improved digital collaboration systems (DCS) usage is necessary for product-disrupted MSMEs. The association between DCSS and organizational agility needs to be more significant.

H4. Product disruption positively moderates the relationship between DCSs and a firm's Organizational Agility.

The Conditional Effects of DCSS in Digital Disruption

The study shows the conditional effects of Digital Communication Systems in an uncertain environment. As we already know MSMEs need to implement the digitization process to remain relevant. However, this study needs to shed light on the complex relationship between DCS and Organizational Agility in the face of digital disruption. Contrary to the expectations of this study, DCS does not directly affect the organizational agility of MSMEs (Horváth & Szabó, 2019). DCS can only improve organizational agility for digital disruption alone. This shows that DCS has a conditional effect so that some SMEs can benefit from the digital strategy that has been made (Coco et al., 2023). In a changing environment, digital transformation is through a planned approach and adapted to the organizational situation (Coco et al., 2023). Furthermore, market disruption might lead organizations to refrain from sharing their information and experience about organizational growth (Aro-ra et al., 2016). Thus, in times of market uncertainty, small and medium-sized enterprises (SMEs) may choose not to adopt or use DCS (Figure 1). Our hypothesis is as follows:

Figure 1: Implementing and maximizing the efficiency of a decentralized control system



H5. Market disruption negatively moderates the relationship between DCSS and Organizational Agility.

Figure 1 depicts the study's proposed model.

METHOD

Data Collection and Sample

Manufacturing MSMEs gave data. The Orbis database had 1,136 manufacturing enterprises with RM1.5 million to RM50 million yearly revenue at the end of 2019. Webropol's online poll recruited CEOs for the research. After getting an email invitation, 21 of 720 organizations completed the survey. 398 firms were phoned to increase response rates. 86 firms refused the study, while 312 participated. The study included 159 firms. One of 187 replies was a duplicate. The final sample of 186 MSMEs had a reasonable 21% response rate. Non-response bias was investigated by comparing non-respondent and respondent turnover rates using a t-test. The t-test found no significant group differences ($t = -0.511$, $p = 0.591$). The sample represents the population.

The key participants were 80% CEOs, 5% CFOs, and 15% other managers. The final sample is primarily small firms, with 81% having fewer than 64 people and 70% under RM10m in sales. Metal manufacturers make up 60% of the sample. 39% of surviving companies create electronics, chemicals, petroleum, rubber, plastic, food, or transportation.

Measures

DCSs were determined by administering a one-of-a-kind 20-item survey that probed the level of digital connectivity throughout the organization. The measuring device was developed by three professors using data from DCSS studies. A CEO of a medium-to-small-sized manufacturing company and an IT expert and consultant looked it over. Upstream (suppliers) and downstream (customers) DCSs (Demand Chain Scores) are assessed by the components. From "not at all" (1) to "very much" (7), the DCSS items were rated. Since the DCS measuring device is brand new, we put it through its paces to ensure it works as intended. We obtained four variables from our preliminary factor analysis. Different DCSs were classified into four groups to represent the aspects at play better: digital supply chain transparency (6 things), digital product data (2 items), digitally enabled order-delivery process (4 items), and digital customer/supplier interaction (6 items). With a result of 0.85, the sample met the minimum threshold of 0.5 according to the Kaiser-Meyer-Olkin (KMO) test. Furthermore, the data were deemed appropriate for component analysis using Bartlett's test of sphericity (1992,18, $p = 0.000$).

After using Oblimin rotation, the researcher isolated four factors that accounted for 70% of the variance. Due to low loadings, two goods were discarded. Following that, the accuracy and uniformity of the dimensions were checked. Although the AVE values for the digital supply chain transparency dimension are less than half, its composite reliability (CR) and Cronbach's alpha values are more than 0.7. The research considers AVE levels greater than 0.4 to be acceptable. Discriminant validity was evaluated using maximum shared variance (MSV) and average shared variance (ASV) values. A lower average variance extracted (AVE) was the primary criterion for discriminant validity, along with a lower mean square variance (MSV) and average shared variance (ASV). No problems with discriminant validity were found in the DCSS components

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throughout our analysis (Table 1). Our research indicates that DCS dimensions are genuine and dependable. Among the notable results are the following: digital supply chain transparency (AVE = 0.41, CR = 0.79, a = 0.78), digital product data availability (AVE = 0.56, CR = 0.80, a = 0.79), digital order-delivery efficiency (AVE = 0.49, CR = 0.79, a = 0.80), and digital customer/supplier engagement.

A digital disruption scale tracked changes to products, channels, and markets. Researchers have confirmed the accuracy of the measurement device. Market disruption gauges customer tastes, while product disruption tracks the regularity and velocity of technological change. Competition is measured by channel disruption. Three questions were used to rate each dimension on a seven-point scale, ranging from "totally disagree" (1) to "totally agree" (7). The reliability and validity of the Market disruption scale were compromised since one item failed to load. As a result, the composite reliability (CR) value dropped to 0.49, and the average variance extracted (AVE) value dropped to 0.30, but the reliability coefficient (a) remained unchanged at 0.50. We did not include the idea of market disruption because of the potential difficulty in interpreting the results. Table 1 shows that market disruptions caused discriminant validity problems, whereas disruptions to channels and technology did not. Credible and valid results were obtained from the product disruption scale (AVE = 0.69, CR = 0.80, ASV = 0.21) and the channel disruption scale (AVE = 0.60, CR = 0.79, ASV = 0.28).

Table 1: Validity and reliability

Construct	CA	CR	AVE	MSV	ASV
Digital Communication System					
Digitized visibility into the supply chain	0.79	0.78	0.39	0.38	0.28
Product information stored digitally	0.68	0.66	0.60	0.31	0.30
Delivery of orders made possible by digital means	0.78	0.79	0.63	0.39	0.29
Participation of digital customers and suppliers	0.88	0.86	0.59	0.50	0.29
Digital Disruption					
Channel disruption	0.80	0.79	0.60	0.01	0.28
Market disruption	0.59	0.44	0.25	0.49	0.27
Product disruption	0.79	0.80	0.69	0.56	0.21
Organizational Agility					
Delivery performance	0.87	0.86	0.50	0.02	0.15
Production costs	0.83	0.89	0.52	0.24	0.10
Product Quality	0.89	0.90	0.76	0.49	0.15

Notes: CA = Cronbach's alpha; CR = Composite reliability; AVE = Average variance extracted; MSV = Maximum shared variance; ASV = Average shared variance

The organizational agility measurement instrument was derived from earlier studies. Product quality (two items), production costs (four items), and delivery performance (four items) made up the operational performance evaluation. Each dimension was rated on a seven-point scale, with one representing complete disagreement and seven representing complete agreement. With an AVE of 0.50, CR of 0.86, and ASV of 0.15, the production costs, delivery performance, and product quality were all legitimate and dependable. Organizational Agility does not raise any difficulties with discriminant validity, as seen in Table 1. To ensure the Organizational Agility evaluation was accurate, we looked at how the three-dimensional operational performance measure tied into the financial data's objective performance metrics. Using a three-dimensional operational performance indicator, we discovered a strong positive correlation ($r = 0.15$, $p < 0.05$) with the EBITDA margin of each business. This demonstrates the reliability of the subjective performance metric.

Furthermore, we accounted for the business's age, size, and industry. You can't predict how old a company will be. Using dummy coding, we determined the company's size according to its turnover: 0 indicates a turnover below RM10m, while a value of 1 indicates a turnover exceeding RM10m. The metal industry was designated 1, and all other industrial sectors were given the value 0 using fake variables.

Test of Measures

Stata 15.1 conducted a confirmatory factor analysis to ensure the measurement model was valid. The latent variable loadings for all items ranged from 0.25 to 0.95 and were statistically significant ($p < 0.000$). Due to its inclusion on a validated scale, we included the item in the measurement model despite its moderate loading of 0.25. Every other loading was ok. Despite having loadings below Hair et al. (2014) minimum of 0.5, both components passed the minimal criteria of 0.4 utilized in earlier research. Good model fit is shown by $X2/df = 1.70$, CFI = 0.89, TLI = 0.90, SRMR = 0.09, and RMSEA = 0.05. The testing shows the validity of the measuring model. We used many assessments to reduce the frequent variance in techniques. After that, we checked how the study model fared against a one-factor counterpart. The research model provides a more satisfactory fit ($x2/df = 1.70$; CFI = 0.89; TLI = 0.90; SRMR = 0.09; RMSEA = 0.05) compared to the single-factor model ($x2/df = 4.69$; CFI = 0.39; TLI = 0.40; SRMR = 0.17; RMSEA = 0.11). Discovered little variation in typical techniques. We used the marker variable strategy as a recommended way to lower common method variance. The research makes use of a marker variable that is conceptually unconnected. Nevertheless, academics seldom look at unconnected concepts. Typically, they will use a variable that does not correlate well with the ones used in the study. It was more likely that the marker variable could capture variance in the same manner since its

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scale was comparable to that of the main study variables. We used three-part flexibility as our marker variable. It may be evaluated using the same scale as turbulence and connectivity and has a weak correlation with both. So, like other factors, it influences study variables. Since the correlations were true both with and without the marker variable, the analysis of common method variance demonstrates that it did not affect the results. Thus, the results demonstrate that the analysis accounts for common technique variation and does not invalidate the study's findings.

ANALYSIS AND RESULTS

Stata 15.1 moderated regression analysis was used to examine the study hypotheses thoroughly. The averages, standard deviations, and correlations between the constructs are visually shown in Table 2. According to Table 2, the highest level of correlation among the independent variables is 0.32. The Variance Inflation Factor (VIF) reveals that all structures have values below the 10 threshold, with the highest VIF being 1.12, according to Hair et al. (2014). Avoiding worries about research model multicollinearity, this review is thorough. Table 3 presents the results of the hierarchical regression analysis that tested the study hypotheses. In the first research, digital disruption mitigated the relationship between DCSs and organizational agility. Organizational agility was unaffected by Model 1, which only accounted for company age and industry control. Digital disruption and organizational agility were shown to have a strong positive connection (b = 0.22, p < 0.001) in Model 2. Primary study paradigm: Add the moderating influence of digital disruption to Model 3. The lack of a correlation between DCSs and Organizational Agility (b = -0.03, n.s.) disproves H1. With a coefficient of 0.21 and a p-value less than 0.001, the model emphasizes how digital disruption significantly impacts the connection between DCSs and operational performance. This demonstrates that external conditions impact DCSs and organizational agility. Using DCSs improves organizational agility during a digital disruption but reduces it during periods of low turbulence. That being the case, H2 is valid. In light of the multifaceted nature of organizational agility, the moderation model explains fifteen percent of the variation in organizational agility across MSMEs. The effects of digital disruption on performance and DCSs were examined in the study. Digital disruption impacts DCSs and operational performance, as seen in Figure 2.

Table 2 Correlations, means, and standard deviations

Variable	Mean	SD	1	2	3	4	4a	4b	4c	4d	5&6
1. Duration of the company	35.83	14.67									
2. Business size (1= more than RM10m)	0.21	0.52	0.05								
3. Sector 1: Metals and alloys	0.60	0.50	—0.20*	—0.04							
4. System for Digital Communication	1.70	1.11	0.00	0.12	—0.04						
4a. Transparency in the digital supply chain section	1.33	1.20	0.00	0.11	—0.05						
4b. Information on digital products	2.45	1.21	0.03	0.04	—0.03		0.32***				
4c. Digitally enabled order-delivery process	2.69	1.50	—0.03	0.22	—0.05		0.69***	0.22***			
4d. Digital customer/supplier involvement	3.78	1.50	—0.00	—0.0	0.04		0.53***	0.50***	0.60***		
5. Channel disruption	3.40	1.20	0.03	0.09	—0.20*	0.05	—0.02	0.03	0.07*	0.08	
6. Product disruption	4.54	1.32	—0.12	—0.02	0.08	0.21***	0.30***	0.31***	0.30***	0.31***	0.08
7. Organizational Agility	5.89	0.77	—0.04	0.04	—0.06	—0.00	0.3	—0.03	0.02	0.05	0.10*** 0.22*
Notes: *p ≤ 0.05, **p ≤ 0.01, ***p ≤ 0.001											

Table 3 Hierarchical regression analysis' results

Dependent variable: Organizational Agility	Model 1	Model 2	Model 3
Control variables			
Duration of the company	—0.00	—0.00	—0.00
Business size (1= more than RM10m)	—0.22	—0.20	—0.23
Sector 1: Metals and alloys	0.23	0.20	0.09
Main effects			
Digital Communication System (DCSs)		—0.08	—0.05
Digital disruption		0.18***	0.19**
Moderation effects			

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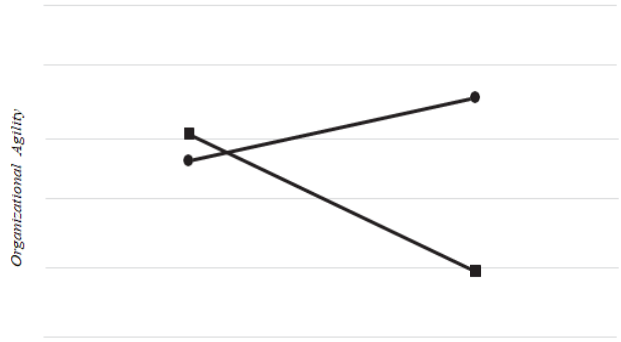
DCSS ×digital disruption			0.21***
DR^2	0.02	0.03	0.05
R2	*0.03*	*0.04*	*0.13*
Adjusted R^2	0.00	0.04	0.12
F	0.88	4.33	6.61
Notes: $^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$			

Figure 2 The role of digital disruption as a moderator in the DCSs-ORA connection



Digital Communication System

As shown in Table 4, we independently tested several forms of turbulence to understand better how digital disruption impacts DCSs and Organizational Agility. The investigation proves that channel disruption improves organizational agility (Kouhizadeh et al., 2021). The influence is substantial (b = 0.17, p < 0.01) and enhances the link between DCSs and Organizational Agility (b = 0.23, p < 0.001). This supports H3. Figure 3 shows that DCSs enhance MSME organizational agility after significant channel interruption. DCSs reduce Organizational Agility with minimum channel disturbance. Product disruption favorably impacts organizational agility (b = 0.16, p < 0.05). It is not a significant mediator of organizational agility. The evidence does not support H4. Unfortunately, measurement reliability issues prohibited H5's market disruption assessment. H5's empirical verification has not been investigated. The effects of digital disruption on DCSs and organizational agility are discussed in these results. They explain organizational responsiveness in tumultuous settings (Pfister & Lehmann, 2021).

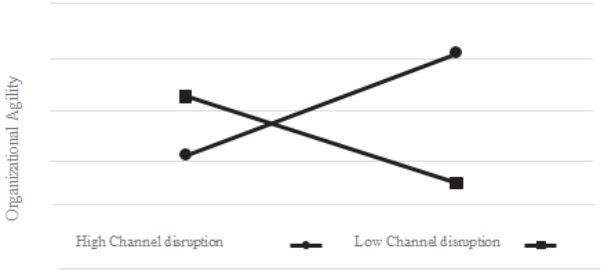
DISCUSSION

This research examines how digital disruption impacts Digital Communication Systems (DCSs) and Organizational Agility in Micro, Small, and Medium Enterprises (MSMEs), expanding supply chain digitalization knowledge. Academics and experts agree that DCSs are vital to MSMEs. According to our study, digital disruption uniquely shapes the organizational agility of DCSs and MSMEs. This addition considerably enhances supply chain digitization expertise. Significantly, our research shows that DCSs alone do not affect Organizational Agility. This shows that digital technology does not guarantee operational efficiency (Bagale et al., 2021). This finding reinforces the IT productivity paradox, which challenges the premise that technology constantly improves organizational performance. Our research clarifies the complicated relationship between DCSs, digital disruption, and organizational agility in MSMEs (Fauzi & Sheng, 2020). We illuminate the complex relationship between these aspects to inform supply chain management and digitalization research and practice.

Table 4 Findings about the moderating impacts of various forms of digital disruption on the organization's agility and DCS relationship

Dependent variable: Organizational Agility	Model 1	Model 2
Control variables		
Duration of the company	—0.00	—0.00
Business size (1= more than RM10m)	—0.20	—0.05
Sector 1: Metals and alloys	0.15	0.03
Main effects		
DCSS	—0.07	0.05
Product disruption	0.14*	
Competitor turmoil		0.18**
Moderation effects		
DCSS × product disruption	0.09	
DCSS × competitor turbulence		0.22***
R2	0.05	0.15
Adjusted R2	0.02	0.22
F	1.68	5.89
Notes: *p < 0.05, **p < 0.01, ***p < 0.001		

Figure 3 The moderating effect of channel disruption on the relationship between DCSs and Organizational Agility



Manufacturing businesses struggle to use digitalization, creating the DCSs conundrum. According to previous research, electronic supply chain activities may be non-linear or affect digitalization and performance. Our research shows that DCSs and performance rely on operational conditions, providing significant insights.

Contrary to predictions, we found that DCSs did not directly affect organizational agility. Instead, digital disruption simplifies that connection, highlighting its complexity. This research investigates DCSs and its performance in different conditions, challenging the idea that digitization is always effective.

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Our research sheds light on the implications of various aspects of digitization on MSMEs. We provide a new explanation for the contradictory findings associated with past research on the relationship between digitalization and corporate success: environmental conditions may influence the conditional effects.

Our research has also shown that DCSs (Digital Communication Systems) considerably increase organizational agility in high-channel disruption contexts (Cue-to et al., 2022). Recent theoretical studies suggest that digitalization might provide a competitive advantage in fast-paced, competitive contexts. Interestingly, product disruption does not affect DCSs (Digital Communication System) or organizational agility. Research suggests that bigger partner corporations significantly impact technical choices in cooperation with MSMEs (Guimarães et al., 2021).

Our focus on MSMEs' digitization and transformation addresses a research need. We learn how MSMEs handle digital connection difficulties and possibilities by studying DCSs, which include digital technology and communication. This holistic methodology provides scientifically proven insights into MSMEs' digitalization, environmental variables, and organizational performance (Bagale et al., 2021).

CASE STUDY: MSMEs in MALAYSIA's MANUFACTURING SECTOR

The case study examines Malaysian manufacturing MSMEs. MSMEs grapple with digital disruption like other industries. This instability drives the company's digitalization initiative to use technology and communication channels. Digital Communication Systems upstream and downstream are examined to assess MSMEs' sustainability. DCSs affect organizational agility in 192 MSMEs under digital disruption. The intricate relationship between DCSs and Organizational Agility emphasizes its relevance in high-turbulence situations. This case study examines how digitalization, DCSs, and disruption affect Malaysian manufacturing MSMEs.

Data Collection and Research Methodology

This study examined 159 Malaysian manufacturing MSMEs. A quantitative study examined how downstream and upstream DCSs affect digital disruption organizational agility. MSMEs' top managers and decision-makers got structured surveys. Surveys examined DCSS use, organizational agility, and MSMEs' digital disruption. DCSs, Organizational Agility, and digital disruption were regression-analyzed. Using large data sets, quantitative researchers can generalize DCSs and organizational agility in Malaysian manufacturing MSMEs.

Analysis of the Impact of DCSS on Organizational Agility

Complexity characterizes digital communication and organizational agility. According to this study, the adoption of digital communication systems (DCSs) did not boost MSMEs' organizational agility. Study: Digital disruption improves DCS organizational agility. DCSS promotes organizational adaptability in tough circumstances. Thus, contextual factors and changing organizational environments must be considered while creating a digitization plan. MSMEs can navigate the digital environment and grow sustainably by understanding DCSs' conditional consequences.

FINDINGS AND INSIGHTS FROM THE STUDY

This research shows how digital disruption impacts MSMEs' sustainability. Contrary to predictions, DCSs deployment did not influence MSMEs' organizational agility. The research found that DCSs promote organizational agility in high-turbulence conditions. The magnitude and type of digital disruption emphasize the necessity of understanding DCSs and Organizational Agility. This suggests that dynamic MSMEs require a context-specific company digitalization strategy. More studies should explore more conditions to explain discrepancies in previous findings.

Implications for MSMEs' Business Digitization Strategy

This research has various ramifications for MSMEs' digitization strategy. MSMEs must realize the value of DCSs in promoting Organizational Agility, particularly in high-digital-disruption contexts. DCSs are important in dynamic contexts but not stable ones. MSMEs should prioritize digital technology and communication systems to handle an unstable business climate. Second, MSMEs must adapt digitization to their industry and environment. MSMEs may boost digital strategy and sustainability by identifying and adjusting to these elements.

Tailored and Context-Sensitive Approach to Digitalization in Dynamic Environments

MSMEs must digitally adapt to changing business conditions. MSMEs must carefully evaluate their digital strategy in light of rapid technological improvements and digital disruption. Understanding the issues and possibilities in their industry and market is necessary. A comprehensive digitization plan is not enough in a changing situation. MSMEs need a tailored digital strategy. Tailored and contextual digitalization may help MSMEs overcome digital complexity and survive in unpredictable times.

The Importance of Inter-Organizational Dimensions in MSMEs' Digital Strategies

MSMEs need an inter-organizational digital strategy. In their digitization journey, MSMEs must evaluate their partnerships. Understanding the dynamics between organizations helps MSMEs take advantage of DCS and increase organizational agility. Understanding MSMEs dynamics and external factors requires a personalized and context-sensitive strategy. An inter-organizational digital strategy can help SMEs resist digital disruption and thrive sustainably in today's changing business environment (Zaheer et al., 2019).

RECOMMENDATIONS

Business digitization must be personalized and context-sensitive for MSMEs to be competitive and thrive in the digital age. MSMEs need to first assess the demand and strength of their digital and communication technology (Ahmad, 2024). This demands organizational capabilities, resources, and a rigorous digital transformation readiness assessment. Understanding their needs helps MSMEs choose the best communication platform and digital technology. Second, MSMEs should aggressively seek collaboration and partnership with digital ecosystem stakeholders. This allows them to leverage the knowledge and resources of a more prominent organization to expand their network and market. MSMEs must monitor and adapt to new technologies, market developments, and consumer demands. A proactive approach can help SMEs stay ahead in the digital world.

CONCLUSION

In conclusion, our research illuminated DCSs' application in dynamic MSMEs. The data suggest that DCSs affect Organizational Agility in high-digital-disruption contexts. This detailed understanding of DCS's conditional consequences

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underscores MSMEs' need for context-sensitive business digitalization. Additional conditional impacts and contextual elements affecting MSMEs' digital strategies should be studied to improve company's sustainability.

Finally, this research showed how Digital Communication Systems influence MSMEs amid digital disruption. Research shows that the deployment of a digital communication system does not influence MSMEs' organizational agility. Digital Communication System boosts organizational agility in high-turbulence conditions. According to this research, digital disruption affects digital communication systems and organizational agility. This study highlights contextual elements and the conditional impact of the Digital Communication System on MSMEs in managing digitalization in changing business situations.

Digital ecosystems influence MSMEs' sustainability. MSMEs use digital communication technologies and connectivity to promote organizational agility as technology alters business. Digital disruption impacts the efficacy of various digital methods. Digital Communication System benefits MSMEs, but digital disruption threatens its sustainability. Further research should analyze conditional effects to explain differences in past studies. To survive in the digital age, MSMEs must customize and contextualize business digitalization.

Future Research Directions and Areas for Further Exploration

Future studies could resolve the discrepancy with more conditional effects. This study reveals a complex link between digital DCSs and organizational agility in the face of digital disruption, although other contextual variables may alter MSMEs' digital strategies. In future studies, organizational culture, leadership, and resource availability may influence DCSs and agility. Examining how an industry's ways and factors, as well as its market competitiveness, affect the sustainability of DCSs may provide additional insights into the study. Future research related to this topic can help MSMEs manage the digital world well and sustain their businesses for a long time. The study is also able to explain the complex interaction between digital communication systems, digitization, and digital disruption in existing or future MSMEs. It emphasizes context-sensitive corporate digitization in dynamic situations. The use of digital communication systems may not directly affect MSMEs' organizational agility, but it is essential to improve performance in the face of high digital disruption. This perspective outlines the conditional consequences of digital connectivity and MSMEs' challenges and digital potential. MSMEs pursuing sustainability need more research on conditional effects and contextual elements.

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