

UNLOCKING SME COMPETITIVENESS THROUGH DIGITAL TRANSFORMATION AND STRATEGIC AGILITY: A PAKISTANI PERSPECTIVE

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Abstract

Digital transformation (DT) has become one of the most important competitive advantages of small and medium-sized enterprises (SMEs), although the effects of transformations on firm performance still depend on organizational performance in terms of strategic agility (SA). This paper examines the direct and indirect impact of digital transformation to the performance of the SMEs under the influence of strategic agility as a dependent variable, concentrating on service-sector SMEs in Pakistan. A questionnaire was developed and the managers and top executives (n=250) were used to fill out the structured questionnaires and the data analyzed through Partial Least Squares Structural Equation Modeling (PLS-SEM). The findings suggest that digital transformation has a major impact on improving strategic agility, which positively affects the performance of firms. There is also a direct positive relationship between digital transformation and performance, and strategic agility mediates the relationship to some extent. These results indicate that digital technologies do not suffice to deliver high-performance levels, but they should be utilized with the help of agile practices and dynamic capabilities. The research is relevant to the literature since it combines DT and SA in a developing-country SME environment, and provides effective insights that could be used by managers and policymakers to facilitate the use of digital and agility toward sustainable organizational development.

Introduction

The modern business world is challenging companies as it has never been before because of the fast rate of technological evolution, globalization, and customer demands. Digital transformation, which can be defined as adoption of digital technology in all sectors of a business organization to transform operations, value provision and competitive positioning and make them sustainable, is now a strategic necessity of organizations that want to perform sustainably and survive in a changing business environment (Escoz

Barraga, 2025). Digital transformation helps companies to utilize digital potentials to enhance efficiency, innovation, and support a new business model that generates long-term growth and competitive advantage (Escoz Barragan & Becker, 2025). Though it is significant, organizations have difficulty placing the digital initiatives into better performance returns, especially in resource-based environments where strategic orientation and nimbleness are constrained.

Strategic agility is the key to the prosperous implementation of digital transformation because it means the capacity of a firm to recognize and effectively respond to any changes in the environment by means of flexible approaches, dynamic capabilities, and lifelong learning (Zahoor et al., 2022). Empirical results indicate that those organizations that integrate digital efforts with strategic agility have a higher probability of achieving superior performance results as agility allows companies to feel the opportunities and reorganize the resources as the markets become turbulent (Zahoor et al., 2022; Syarkani, 2025). Additionally, digital transformation increases the organizational performance as it improves organizational competencies like innovation, customer responsiveness, and operational flexibilities, among others, that positively affect the performance of a firm (Small Business Economics evidence; Escoz Barragan and Becker, 2025). Therefore, digital strategy models and dynamic capability views are strong theoretical concepts to explain the impact of digital transformation on the performance of firms based on strategic agility processes.

SME sector has become a very important driver of economic growth and employment in the world. The SMEs play a vital role in GDP, innovativeness and employment in both developed and emerging economies. Nevertheless, SMEs are frequently unable to deploy strategic resources, technological capability, and managerial expertise topographically because of special restrictions, which constrain their ability to adapt and survive in an ever-more digital marketplace. Nonetheless, digital transformation can be used to represent an equalizer to SMEs in the competitive environment, as it has allowed them to reach international markets, streamline operations, and connect with customers digitally (Small Business Economics evidence; Escoz Barragan and Becker, 2025). However, the efficiency of digital transformation in improving the performance of SMEs

is still dependent on the creation of strategic nimbleness and the possibility to effectively undertake change.

The SME sector is one of the backbones of the economy in emerging economies like Pakistan to the extent that it plays a significant role in providing employment, foreign exchange, and diversifying the economy. However, barriers that Pakistani SMEs usually face are the lack of access to digital infrastructure, as well as insufficient strategic planning and low rates of technological adoption, and restrict the potential of digital transformation to provide a competitive edge. Empirical research in Pakistan points to a similar direction, recently, and has shown that, despite the fact that these relations have not been sufficiently studied, digital transformation positively affects the performance of SMEs and their marketing results (but not well understood by the underlying mechanism, e.g., research findings that rank the relationship between digital transformation and marketing performance to be positive among Pakistani SMEs (Lungu, 2020; Hamayun, 2025). Moreover, a study in Pakistan shows that digital transformation can affect the innovation and organizational performance, whereas the strategies enablers, including change readiness and absorptive capacity, have different levels of effectiveness (Nguyen, 2025). This prompts the urgent necessity of more sensitive empirical studies that would explore the impact of the digital transformation on the performance outcomes conditioned by strategic agility in the context of the particular setting of Pakistani SMEs.

Although the study has developed a scholarly interest, it still has a gap in theory and empirical evidence of how strategic agility mediates the digital transformation performance relationship among Pakistani SMEs. Furthermore, although the significance of digital capabilities in the competitiveness of firms has been recorded in the world literature, the situational factors that affect

SMEs in emerging economies, e.g., Pakistan, i.e., the lack of digital infrastructure, instability in markets, and lack of resources, make it evident that the primary research should be conducted with rigorous survey tools. The proposed research fills this gap because it uses a questionnaire-based research to explore the impact of digital transformation on strategic agility and firm performance among service-sector SMEs in Pakistan. In this way, it would add to the body of research in strategic management and entrepreneurship by shedding light on how digital transformation can lead to performance in new market environments.

Literature Review

Digital Transformation and SMEs

The increasing rate of change in technology has led to the digital transformation (DT) becoming a strategic requirement workforce in a variety of industries. Digital transformation is the use of digital technologies to transform every aspect of business operations and change business models and processes, as well as market relations, in order to become more competitive and improve business performance (Vial, 2019; as reported in IJRRT). Research has found out the positive effect of the digital transformation on firm performance which is the fact that it enhances operation efficiency, expansion of the market and innovation (Rawashdeh, 2024). In SMEs, DT is especially effective since these companies are not as large as they can use digital technology to gain flexibility, cost-effectiveness, and customer interaction (Sagale & Óri, 2024). Nonetheless, it is also highlighted in the literature that DT is not the simple implementation of technology but should be strategically aligned with the firm goals, management dedication, and innovation ability to convert the digital efforts to performance results (Hafeez et al., 2025; Rahman, 2025).

In spite of its potential, SMEs have various barriers to digital transformation, such as financial limitations, the absence of digital skills, and change resistance (IJRRT review). These obstacles tend to result in partial or ineffective digitalization that weakens the capacity of SMEs to use digital transformation to their competitive advantage. As a result, scholars have postulated that the performance advantages of digital transformation in SMEs rely on organizational settings and strategic facilitators like leadership, digital competencies, and dynamic capabilities (Sagale & Óri, 2024).

Strategic Agility as a Mediating Mechanism

Strategic agility means the capability of a company to quickly sense and react to environmental shifts by restructuring its resources, tactics, and procedures, enabling rapid adjustment of strategic direction to meet emerging demands and opportunities (Gong & Ribiere, 2023; Vial, 2019). Strategic agility is a key mediating variable in the context of digital transformation because it helps firms respond swiftly to digital initiatives in the face of market changes and technological disruptions (Gong & Ribiere, 2023; integrative literature review on agility). Empirical studies indicate that agility complements digital transformation and promotes experimentation, continuous learning, and responsive adaptation, as agile principles facilitate incremental development and flexible processes that enhance digital change management (Popoola et al., 2024; Fuchs & Hess, 2018; Khan, 2025). The literature across various industries has also shown that organizational agility enhances the impact of digital transformation on performance outcomes by enabling rapid decision-making and strategic flexibility, thus improving an organization's ability to maintain competitiveness in dynamic environments (Gong & Ribiere, 2023; integrative literature review on agility).

Another point that is well brought to light by the literature is that strategic agility cannot be simply created by adoption of technology. Rather, it is developed via dynamic capabilities the organizational routines and processes that enable the opportunities to be sensed, grasped timely, and converting the resources in order to exploit them (Teece et al., 1997; cited in global review on digital transformation). Thus, strategic agility is a crucial mechanism by which digital transformation is transformed into performance gains.

SME Performance Outcomes in the Digital Age

SMEs have various aspects that are associated with firm performance such as innovation skills, market sensitivity, and digital skills. Studies show that digital transformation has a positive influence on business performance, as it allows businesses to be innovative, handle customers better, and conduct more effective operations (Susanti et al., 2023; Vial, 2019). Research on SMEs in Pakistan has also mentioned positive

associations between digital transformation and marketing performance whereby the evolution of digital capabilities can help organizations improve their performance to a great extent (Kumar et al., 2022; Ali et al., 2021; Rahman, 2025).

Although these results exist, the gaps in the knowledge of the digital transformation impact on the overall performance indicators not limited to marketing, including innovation performance, financial performance, and strategic flexibility remain, particularly in the developing world, such as Pakistan. The Dynamic Capabilities View suggests that performance of firms is optimized when the process of digital transformation is entrenched in the core of strategic capabilities, which allows organizations to sense opportunities, reconfigure resources and create value as a result of continuous change and adaptation (Teece et al., 2016; Susanti et al., 2023).

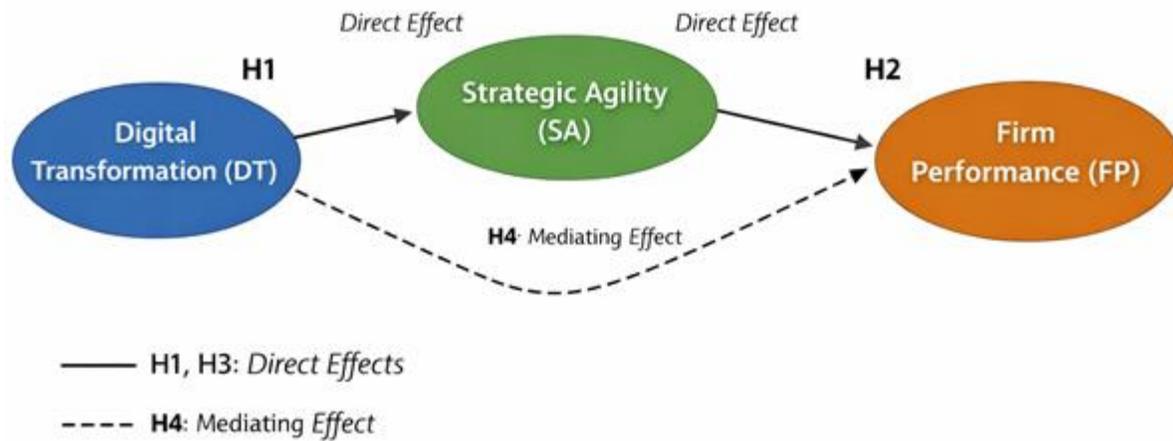


Figure 1. Conceptual Model

Supporting Theories

The current research is based on three theoretical perspectives, which are complementary, and which explain the impact of digital transformation (DT) on firm performance. Resource-Based View (RBV) suggests that competitive advantage is attained by firms when there is a utilization of resources and capabilities

that are unique, valuable and inimitable (Barney, 1991). Digital technologies and competencies are strategic resources that can distinguish firms and improve the performance when properly incorporated into business processes in terms of digital transformation, but static resources are not enough and possibility to restructure and introduce these

resources to the changes in the environment is of primary essence. The Dynamic Capabilities View (DCV) builds on RBV by stating that companies need to feel opportunities and threats, exploit them using their resources and redeploy them using their assets to adjust to new environments that are changing fast (Teece et al., 1997). In very dynamic digital environments, DCV: a few firms manage to transform digital investment into performance benefits by adapting and being strategic, with routines and managerial capabilities that enable them to continue adjusting to change and be strategic, which supports its mediating position in the DTperformance relationship. To further substantiate these views, the Knowledge-Based View (KBV) emphasizes the fact that organizational knowledge such as specialized skills, learning processes, and intellectual capital is one of the leading sources of competitive advantage (Grant, 1996). Within the digital transformation setting, companies that are well-informed in terms of knowledge management and learning have an opportunity to carry out digital activities more efficiently and bind them with the work of strategic processes, contributing to the process of innovation, agility, and overall performance in volatile markets.

Research Methodology

The research design of this study is quantitative, cross-sectional to investigate the effects of digital transformation on strategic agility and firm performance in service-based SMEs in Pakistan. The target population will include SMEs in the fields of IT and software services, e-commerce, private education,

healthcare services, and professional consultancy in accordance with the definition of SMEs offered by the State Bank of Pakistan and SMEDA (companies with less than 250 employees). The firm is the unit of analysis and data were gathered among owners, CEOs and senior managers who are directly related to strategic and digital decisions. The sampling method used was purposive because it gives opportunity to select knowledgeable respondents when the sample frame is non-exhaustive as is usually the case with SME research. According to SEM policies, the target population in the study was 250 to 300 respondents, which would provide the necessary statistical power and generalizability (Hair et al., 2022).

The self-administered questionnaire was a structured self-administered major data collection tool, which was given online and in-person. Validated multi-item Likert scales have been used to measure all constructs and have been based on previous high-impact research. Digital transformation was measured based on Vial (2019) and Warner and Wagner (2019) scale items, strategic agility was based on Doz and Kosonen (2010) and Zahoor et al. (2022) scale items, and firm performance on the subjects of Digital transformation was based on the items of the Vial (2019) and Warner and Wagner (2019) scales. The analysis of data was carried out with the help of the partial least squares structural equation modeling (PLS-SEM) that suits prediction models with mediation effects and does not presuppose absolute normality. The interpretation was done in two steps, measurement model (reliability and validity) and structural model (path relationships and mediation effects).

Results

Table 1: *Demographic profile of respondents (n = 250)*

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	170	68
	Female	80	32
Age	25–34	90	36

	35-44	110	44
	45+	50	20
Firm Age	<5 yrs	60	24
	5-10 yrs	120	48
	>10 yrs	70	28
Firm Size	<50 emp	80	32
	50-100	120	48
	100-250	50	20

The demographic data about the respondents (n = 250) suggests that male respondents prevail in the sample (68%), and females were 32 representatives, which is an expected gender distribution in managerial functions in Pakistani SMEs. In terms of age, the sample was mostly aged 35 to 44 years (44%), then 25 to 34 years old (36%), which implies that most respondents are middle-aged professionals with enough experience to offer valuable information on organizational planning and digital projects.

Regarding the firm characteristics, almost 50% of the SMEs (48 years) were operating 5-10 years long, which means that they were quite mature and could implement strategic and digital initiatives, and younger firms (<5 years old) made 24 and older firms (>10 years old) constituted 28 and 24 percent of the sample, respectively.

With regards to the size of the firm, most of the respondents belonged to 50-100 employee firms (48%), then smaller firms with less than 50 employees (32%), and the remaining 20 percent were of large SMEs with 100-250 employees. On the whole, there is a reasonable balance in the sample in terms of the size and age of firms, which makes it a viable starting point of investigating how digital transformation, strategic agility, and firm performance relate to each other in the context of Pakistani service-sector SMEs.

Table 2: Reliability and Convergent Validity

Construct	Cronbach's α	Composite Reliability (CR)	AVE
Digital Transformation (DT)	0.91	0.94	0.68
Strategic Agility (SA)	0.88	0.91	0.63
Firm Performance (FP)	0.87	0.90	0.65

The findings of the reliability and convergent validity assessment of the constructs applied in the research are found in Table 2. All the constructs have a Cronbach alpha greater than the recommended figure of 0.70 (Nunnally, 1978), Digital Transformation (DT) and Strategic Agility (SA) are 0.91 and 0.88 respectively, and Firm Performance (FP) is 0.87, which means that the measurement items have a high internal consistency level. On the same note, the Composite Reliability values (CR) are higher than the 0.70 mark (DT = 0.94, SA = 0.91, FP = 0.90), which ensure the fact that the constructs are reliably

measured and the indicators are stable and reliable enough to represent the latent variables.

The average variance extracted (AVE), which measures convergent validity, indicates that all constructs have an above-0.50 value (DT = 0.68, SA = 0.63, FP = 0.65), indicating that each construct accounts for a significant percentage of variance in its measures. All these are indications that the measurement model does have reliability and validity and a great base to further analyze structural model and test the hypothesis.

Table 3: *Discriminant validity (Fornell-Larcker and HTMT)*

Construct	DT	SA	FP
DT	0.82		
SA	0.55	0.79	
FP	0.48	0.61	0.81

Table4: HTMT Ratio

Construct Pair	HTMT
DT - SA	0.68
DT - FP	0.59
SA - FP	0.72



The evaluation of the discrimination validity of the constructs by both Fornell-Larcker criterion and the Heterotrait-Monotrait (HTMT) ratio is provided in Table 3. Based on the Fornell-Larcker criterion, the square root of the AVE of each construct (diagonal values: DT = 0.82, SA = 0.79, FP = 0.81) is greater than the correlations of the constructs with others (off-diagonal values), which indicates that each of the constructs is empirically distinct.

Figures of the HTMT ratio also testify to discriminant validity since all figures are lower than the conservative

Structural Model Assessment

Table 5: Structural Model Path Coefficients

Hypothesis	Path	β (Coefficient)	t-value	p-value	Decision
H1	DT → SA	0.42	7.85	<0.001	Supported
H2	SA → FP	0.33	5.90	<0.001	Supported
H3	DT → FP	0.21	3.25	0.001	Supported
H4	DT → SA → FP (mediation)	0.14	4.12	<0.001	Partial Mediation

Table 5 shows the outcome of the structural model analysis, and path coefficients, t-values, p-values, and hypothesis testing. The results show that the positive impact of digital transformation (DT) on strategic agility (SA) is significant (0.42, $t = 7.85$, $p < 0.001$), which confirms Hypothesis 1. This validates that the implementation of digital technologies increases the capacity of the firm to sense and respond to the environmental changes, in line with previous researches on the importance of digital capabilities in promoting organizational agility (Bharadwaj et al., 2013; Tallon et al., 2019).

Strategic agility, in its turn, has a significant effect on the firm performance (FP) (= 0.33, $t = 5.90$, $p = 0.001$), fulfilling Hypothesis 2, which is supported in the literature regarding the beneficial impact of agile decision-making and adaptive routines on firm performance in dynamic environment (Sherehiy et al., 2007; Sambamurthy et al., 2003). Digital

level of 0.85 (DT -SA = 0.68, DT -FP = 0.59, SA -FP = 0.72). This proves that the constructs are not overlapping and are measuring different dimensions of the research model. Altogether, the findings confirm that the scale of measurement is appropriate to the criteria of discriminant validity so that the next structural analysis can be performed to reveal the relationships between digital transformation, strategic agility, and firm performance.

transformation is also directly positively related to the performance of the firms (0.21, 3.25, 0.001), which supports Hypothesis 3 and supports the idea that digital initiatives are the cause of operational efficiency, innovation, and the overall performance.

The result of the mediation analysis (H4) indicates that strategic agility partially mediates the correlation between the digital transformation and firm performance (= 0.14, $t = 4.12$, $p = 0.001$). This indicates that on the one hand, digital transformation directly enhances performance, and on the other hand, its full benefit is achieved when companies have the capability of agility to rearrange resources and act strategically to change. The overall findings of these research confirm the research model and highlight the supplementary functions of digital transformation and strategic agility to improve the SME performance in the Pakistani service sector.

Table 6: *R² and Effect Size*

Endogenous Construct	R ²	Effect Size f ² (DT → SA)	Effect Size f ² (SA → FP)
Strategic Agility (SA)	0.22	0.28	-
Firm Performance (FP)	0.41	-	0.19

Table 6 shows the coefficient of determination (R²) and effect size (f²) of the endogenous constructs in the structural model. The R² of Strategic Agility (SA) is 0.22, which means that the digital transformation accounts for 22 percent of the strategic agility variance. This shows a moderate strength of explanatory power that indicates that although DT is a strong predictor, other aspects could have an effect on organizational agility. In the case of Firm Performance (FP), the R² value is 0.41, meaning that the pair of variables digital transformation and strategic agility explains 41 percent of the variation in firm performance, which is a significant amount of variance as per the traditional criteria (Hair et al., 2022).

The value of the effect size (f²) will show the proportion of each exogenous variable to the endogenous constructs. The medium-large effect of f² 0.28 of DT versus SA confirms the presence of the significant effects of digital transformation on strategic agility. The f² value of 0.19 of SA to FP is a small-to-medium effect, which indicates that strategic agility plays an important role but not the sole role in improving the performance of firms. All these findings in general prove the power of the relationships suggested and show that digital transformation and strategic agility can be considered significant SME performance drivers in the Pakistani environment.

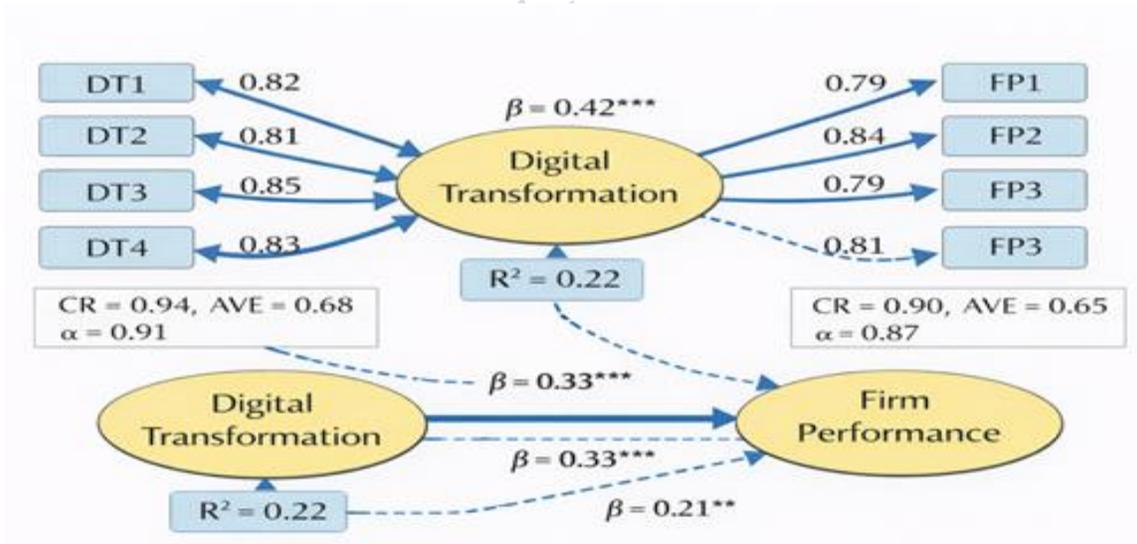


Figure 2. Measurement Model

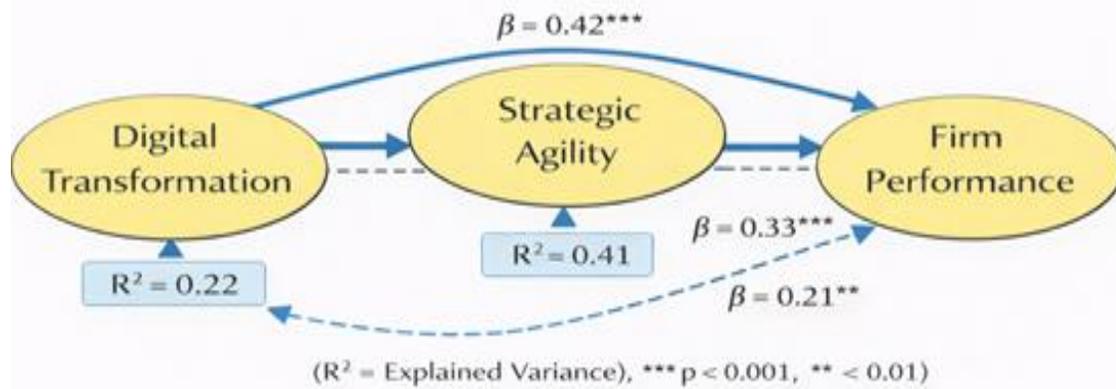


Figure 3. Structural Model

Discussion

The findings substantiated that digital transformation impacts on strategic agility positively (0.42 , $p = 0.001$). This observation can be concluded by the fact that, within the previous literature, the adoption of digital technologies, including cloud computing, big data analytics, and AI, allows organizations to sense the environment in real-time and react in a flexible manner (Bharadwaj et al., 2013; Tallon et al., 2019). Within the Pakistani SME environment, through the implementation of digital tools, companies could simplify operations, improve real-time decision-making and re-arrange resources effectively despite the scarcity of resources (Qureshi et al., 2021). This proves that the digital transformation is a modern paramount agile organizing force, which affirms the dynamic capabilities view (Teece, 2007).

The results found that there is a strong positive dependence between strategic agility and firm performance ($\beta = 0.33$, $p = 0.001$). This supports the previous empirical results, where agile firms record better performance results because of their ability to quickly adjust to the changes in the market and exploit first before their competitors (Sherehiy et al., 2007; Sambamurthy et al., 2003). Strategic agility is specifically required of the Pakistani SMEs that are in a business environment characterized by volatility and

competitiveness, to remain relevant in the market and to be in a position to attain sustainable growth (Hussain et al., 2020).

According to the study, direct implications of the digital transformation on the performance of the firm are also present ($\beta = 0.21$, $p < 0.01$), which is supported by the previous research, according to which digital initiatives improved the work of firms in three aspects: operational efficiency, customer satisfaction and innovation, thus, overall performance (Li et al., 2018; Chanas et al., 2019). The direct impact of DT on performance is most critical in SMEs since digital adoption leads to cost-cutting, automated processes, and market growth, among other characteristics, which otherwise is challenging due to limited resources.

The mediation analysis shown that strategic agility mediates partly the connection between digital transformation and firm performance (0.14 , $p < 0.001$). This validates theoretical propositions, which state that the digital transformation might not necessarily translate into performance improvement unless organizations have the ability to re-align resources and adapt to environmental changes (Tallon and Pinsonneault, 2011). This partial mediation indicates that although DT can give the requisite technological capabilities, strategic agility is a process

through which these capabilities can be translated into specific performance results. This aligns with the results of the international researches (Wamba et al., 2017; Chen et al., 2020) and supports the significance of forming dynamic capabilities in the Pakistani SME segment.

Implications of the Study

Theoretical Implications

This research serves the current body of literature in a number of aspects. First, it incorporates digital transformation, strategic agility and SME performance into one conceptual framework which empirically supports the dynamic capabilities framework within developing country context. The results validate the hypothesis the strategic agility has a partial mediating effect on the correlation between digital transformation and performance thus building on previous studies that mainly tested the direct impact of digital adoption on the performance of firms (Tallon and Pinsonneault, 2011; Wamba et al., 2017). The study fills a considerable gap in the literature by targeting the Pakistani SMEs since the bulk of the digital transformation and agility research are concentrated in the developed economies. In addition, the research confirms the use of PLS-SEM to model complex relationships in SME research and, therefore, proves useful in testing the direct and indirect effects in organizational studies.

Practical Implications

The results provide actionable insights as far as management is concerned. The owners and managers of the SME must understand that digital transformation is not enough to achieve a high performance but must be accompanied by a level of strategic agility, which is reflected by the flexible distribution of resources, quick decisions, and agile organizational practices. Training, knowledge sharing, and redesigning the processes should be part of the

investment in digital technologies (cloud computing, analytics, and digital communication platforms) to maximise the use of these capabilities.

These findings can also be used by policymakers and support agencies in Pakistan. Granting, training, and supporting digital infrastructure can help SMEs to improve competitiveness, innovation, and growth because it encourages the use of digital technologies and agile management practices. Moreover, strategic agility in business incubators and entrepreneurship programs should be stressed in order to enable new firms overcome the market volatility and technological change in a proper manner.

Future Research Implications

The research has indicated the opportunities that can be taken up in future research, which can involve investigating other mediating factors, including innovation ability or organizational learning, which might mediate the relationship between DT and performance. Long-term research would give stronger support of causality and the dynamic development of digital capabilities and nimbleness as time moves on. The factors affecting digital transformation and SME performance on a case-by-case basis could also be identified through comparative studies conducted across various sectors or countries.

Conclusion

This paper has explored how the digital transformation has affected the strategic agility and firm performance of service-sector SMEs in Pakistan, and strategic agility is a mediating variable. The results indicate that digital transformation greatly contributes to strategic agility, allowing companies to feel the opportunities, react swiftly to the shifts in the environment, and reorganize resources in an efficient manner. Strategic agility, on its part, has proven to be of particular benefit to firm performance, which is why it is the emphasis in transforming technological

investments into real business performance. Furthermore, the positive effect of digital transformation on performance is also direct, and strategic agility to some extent mediates this effect which shows the interdependence between technology and organizational flexibility.

Theoretically, this work builds on the Resource-Based View (RBV) and the Dynamic Capabilities View (DCV) as it shows that digital technologies in and of themselves are not enough to attain high performance but rather should be capitalized with the help of agile practices and strategic capabilities. In practice, the findings underscore the need to encourage the investment of digital technologies by SME managers and organizational agility to create the most competitive advantage and sustainability.

In general, it is possible to note that the study makes a contribution to the strategic management and entrepreneurship literature by presenting empirical evidence in a new setting of the emerging economy and offering feasible recommendations to practitioners and policymakers, who want to improve the performance of SMEs using digital transformation and strategic agility.

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