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RESEARCH PAPER

From Pixels to Profits: Configurations of Digital Alchemy for SMEs Excellence

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ABSTRACT

In an era characterized by rapid technological advancements, the integration of digitalization within SMEs has redefined their operational paradigms. This study aims to illuminate the complex configurations that underlie the path towards business excellence through a comprehensive investigation encompassing diverse dimensions of digitalization and digital capabilities. Data acquisition transpires through a questionnaire administered to SMEs' owners, managers and CEOs. The study embarked on a configurational analysis through fsQCA. The findings unveil a spectrum of configurations, each shedding light on the configurations of core and peripheral conditions that frame SMEs' non-financial performance. Amidst different configurations, the prominence of innovation capabilities across solutions and the consistent presence of digital innovation emphasize their pivotal roles in influencing SMEs' non-financial performance. The study recommends making a comprehensive strategy encompassing digital transformation and innovation, collaboration, and technical capabilities to establish an ecosystem where SMEs harness the full potential of digital alchemy for enhanced performance.

KEYWORDS Business Excellence, Digital Capabilities, Digitalization, Innovation, Non-Financial Performance

Introduction

In modern businesses, the convergence of digital technologies and dynamic capabilities has unveiled unprecedented avenues for growth and excellence (Ullah et al., 2023). Small and Medium-sized Enterprises (SMEs) stand at the forefront of this transformative journey, leveraging digitalization to navigate the dynamic challenges and opportunities in the contemporary marketplace. Within this context, Pakistan emerges as a nation with burgeoning SME activity, fueling economic growth and innovation. According to the "Small and Medium Enterprise Development Authority (SMEDA) (2021)," Pakistan boasts a vibrant SME ecosystem characterized by its diversity and contributions to the economy. This rich SME landscape highlights the significance of probing the relationship between digitalization, digital capabilities (DC), and non-financial performance (NFP) within this dynamic setting.

The research objective, outlined in the title, emphasizes digitalization's transformative potential for SMEs. In a world where pixels symbolize digital engagement and profits epitomize business success, the study delves into the resourceful configurations through which SMEs transition from digital presence to tangible financial gains. Informed by this objective, the research endeavors to dissect the multifaceted dimensions of digitalization and DCs, assessing their collective impact on SMEs' NFP. The rationale behind this exploration lies in the understanding that the interplay between digital technologies and DCs could holistically shape SMEs' performance outcomes.

In the rapidly evolving world of contemporary business, the infusion of digitalization has reshaped the operational paradigms of SMEs. This transformational course offers a potent avenue for growth, innovation, and strategic advancement (Algumzi, 2022). As SMEs across Pakistan seek to capitalize on this digital wave, the research question gains salience: How do the dimensions of digitalization and DCs intricately shape the NFP of SMEs? Drawing inspiration from the alchemical process of transforming base elements into precious substances, the study signifies the metamorphic potential of digitalization and capabilities on SMEs' NFP. Pakistan's diverse SME setting presents a compelling context for this inquiry. SMEs are integral to the nation's economic fabric, contributing significantly to employment, innovation, and economic growth. SMEs constitute approximately 90% of all enterprises in the country, accounting for nearly 40% of the gross domestic product (GDP) and employing over 80% of the non-agricultural workforce (SMEDA, 2021). Amidst this backdrop, the research problem centers on untying the configurations between the different elements of digitalization and DCs. The confluence of these factors is believed to be a pivotal determinant of SMEs' NFP, shaping their ability to innovate, adapt, and compete in an increasingly digital world (Ullah et al., 2023). While extant research has shed light on individual dimensions of digitalization or capabilities, a gap exists in comprehensively understanding their combined influence on SMEs' NFP. This study addresses this void by adopting a configurational perspective, recognizing that digitalization and DCs synergistic alignment could be the key to unlocking SMEs' excellence in Pakistan. By investigating this nexus, the research provides SMEs with actionable insights into strategically orchestrating digitalization and DCs to bolster their NFP. This study aspires to empower Pakistani SMEs to pursue sustainable growth and excellence in a digital age where competitive advantage hinges on a harmonious blend of technological engagement and organizational capacities.

The study's innovative contributions lie at the intersection of digitalization, DCs, and performance outcomes, offering novel insights into SME excellence. The research's distinctiveness emanates from its dual facets of inquiry: firstly, the comprehensive assessment of "the impact of digital transformation (DT), digital servitization (DS), digital innovation (DI), smart technologies (ST), human capabilities (HC), technical capabilities (TC), innovation capabilities (IC), and collaboration capabilities (CC) on NFP"; and secondly, the adoption of configurational analysis through fsQCA as the methodological framework. The research's foremost novelty resides in its comprehensive exploration of diverse dimensions of digitalization and DCs, which collectively shape the NFP of SMEs. While prior studies have often scrutinized individual components in isolation, this research undertakes a holistic investigation, recognizing that SMEs' excellence emerges from the complex configurations of these multifaceted variables. Incorporating dimensions such as DS, ST, DI, HC, TC, CC, and IC in a single study presents a holistic perspective that mirrors the nuanced reality of SMEs' operational landscape. The second facet of novelty stems from configurational analysis, specifically fuzzy set qualitative comparative analysis (fsQCA), as the analytical framework. This methodological choice underscores the study's commitment to delving beyond linear cause-and-effect relationships, recognizing the complexity of SMEs' digital journey. The confluence of these two novel aspects holds the promise of uncovering synergistic patterns that underlie SMEs' path to excellence. As SMEs navigate the intricate digitalization environment, this research's findings are poised to furnish actionable insights that guide strategic decisions, optimize resource allocation, and empower SMEs in Pakistan and beyond to harness the transformative potential of digital alchemy for achieving sustainable NFP excellence.

Literature Review

This comprehensive literature review delves into the relationship among digitalization, DCs, and NFP. Within this scholarly inquiry, an in-depth investigation of critical NFP dimensions, encompassing aspects such as customer satisfaction, employee engagement, innovation, etc., is undertaken.

Digitalization and NFP

Organizations employ diverse digital technologies, including but not limited to e-commerce, machine learning and the Internet of Things as mechanisms to create value (Autio et al., 2018). SMEs similarly embrace digital technologies such as e-commerce and social media, in their operational strategies. This adoption of digital technology holds the potential to exert both direct and indirect influences on business performance (Neubert, 2018). In recent research, Sesar et al. (2021) have conducted a study focusing on the ramifications of digitalization on customer satisfaction and loyalty, contending that digitalization plays a pivotal role in enhancing both customer loyalty and satisfaction. Ramanathan et al. (2017) have posited that online knowledge regarding products and services heightens consumer satisfaction within SMEs. Furthermore, Martin and Omrani (2015) suggest a constructive association between digitalization and job satisfaction among workers. Algumzi (2022) has identified that digital marketing initiatives yield a more pronounced positive impact on strategic performance indicators, such as customer and employee satisfaction, within Saudi Arabian SMEs. Radicic and Petković (2023) have discerned that the influence of digitalization on innovation activities varies across SMEs. Gaglio et al. (2022) have illuminated the affirmative effects of digital technologies (such as the utilization of social media) on both innovation and labor productivity. Lastly, Hansen et al. (2019) have affirmed that digitalization contributes to heightened job satisfaction and augmented employee loyalty within organizational contexts. Thus, DCs lead to improve NFP.

H_1: Different dimensions of digitalization (DT, DS, DI, ST) lead to increase NFP.

Digital Capabilities (DCs) and NFP

DCs encompass the capacity to harness digital technologies to create value for diverse stakeholders, including customers, employees, and partners (Nadkarni and Prügl, 2021). These capabilities are pivotal in fortifying an organization's competitive advantage, as they facilitate improvements in operational efficiency, effectiveness, innovation, and product differentiation (Nadkarni and Prügl, 2021). Nevertheless, the cultivation and deployment of digital capabilities represent a nuanced endeavor, necessitating strategic alignment, organizational adaptability, dynamic adjustments, and a continuous learning ethos (Švárová and Vrchota, 2014). SMEs grapple with distinct challenges on their path to DT, primarily stemming from the constraints posed by limited strategic resources, including financial capital, human capital, technological infrastructure, and external networks (Stonehouse and Snowdon, 2007). A pragmatic approach for SMEs lies in adopting DCs (Teece, 2007), which underscore the significance of cultivating human, technical, collaboration, and innovation capabilities. These DCs are instrumental in enabling SMEs to attain and sustain a competitive edge (Teece, 2007). Anwar (2018) delves into the interaction between DCs and competitive advantage within the context of SMEs. The research accentuates that SMEs proficiently leveraging digital technologies can measurably enhance their competitiveness. Jackson (2019) underscores that employees with heightened digital competence are likelier to experience higher job satisfaction. Furthermore, Liao et al. (2019) emphasize the significance of digital collaboration tools in fostering a sense of belonging and camaraderie among team members, thereby augmenting job satisfaction. Thus, DCs drive NFP. Besides, Figure 1 shows study's conceptual framework.

H_2: Different dimensions of digital capabilities (HC, IC, TC, CC) lead to increase NFP.

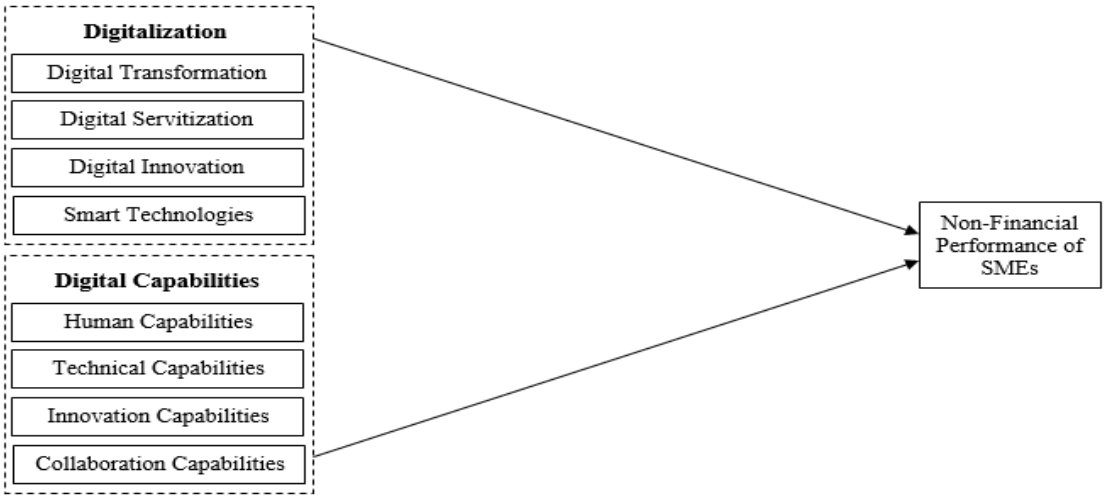

Figure 1: Conceptual Framework

Material and Methods

Data and Variables

The choice of methodology is contingent upon the particulars of data collection and the overarching research objectives. Methodological selection results from meticulous deliberation concerning factors such as sample size, outliers, adherence to multivariate assumptions, normality assessments, and multicollinearity. A list of SMEs was procured from the SMEDA, ensuring the attainment of a representative sample. The data of SMEs working in Pakistan were gathered. Data acquisition transpired through a systematically constructed questionnaire administered to SME owners, managers and CEOs. The responses were gauged on a "5-point Likert scale". The study encompasses a range of independent variables, encompassing diverse facets of digitalization (DT, DS, DI, ST) alongside DCs (HC, IC, CC and TC). The focal point of inquiry revolves around the dependent variable, the NFP of SMEs. The questionnaire items were adapted from prior studies: DT, DS (Baines et al., 2011), DI (Zhen et al., 2021), ST (Sunila et al., 2019), HC, TC, IC, CC (El Sawy et al., 2016), and NFP (Alves and Lourenço, 2022).

Econometric Strategy

Our research aims to thoroughly investigate the influence of digitalization and DCs on the NFP of SMEs. Digitalization represents a multifaceted management practice intricately shaped by interconnected and interdependent variables (Chen and Tian, 2022). Given the intricate nature of these relationships, our study employs the fsQCA methodology. fsQCA presents a comprehensive analytical approach that regards each case as a distinct configuration of antecedent conditions. This method permits the systematic examination of intricate relationships by employing Boolean algebra to ascertain the sufficiency and necessity of digitalization, DC, and SMEs' NFP within each case. By adopting this approach, we can effectively unravel the synergistic interplay among multiple contributing elements (Ragin, 2009; Tahir et al., 2021).

Using analysis of sufficiency, fsQCA assists the assessment of numerous comparable pathways through which digitalization and DCs collectively influence the NFP of SMEs. This method facilitates a subtle interpretation of the relationships between digitalization, DCs, and NFP. As depicted in Figure 2, the configurational framework illustrates the

interconnections among digitalization, DCs, and NFP in the context of SMEs. The fsQCA procedure commences with calibrating causal factors and outcome variables into fuzzy sets, represented by values ranging from 0 to 1. Within this framework, 0 signifies non-membership, whereas 1 indicates full membership. This analytical approach provides a robust means to holistically explore and decipher the causal relationships inherent in digitalization, DCs, and SMEs' NFP.

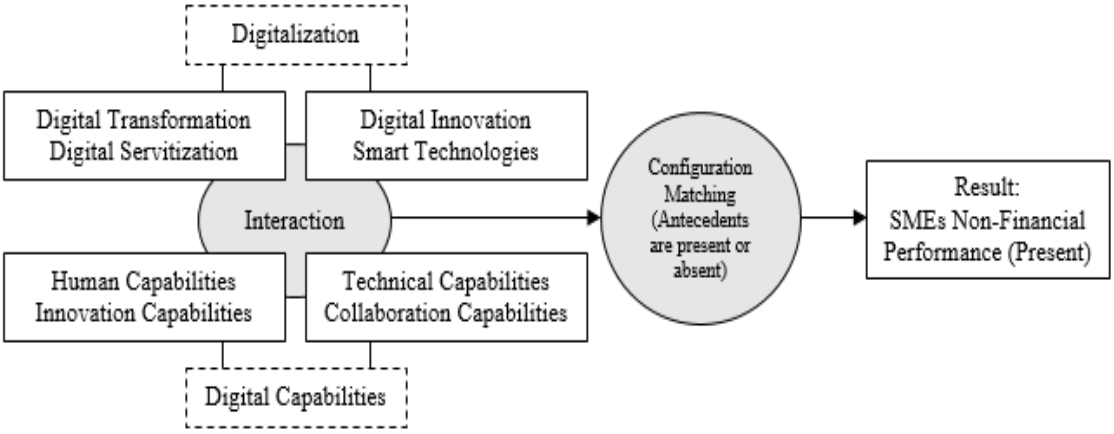

Figure 2: Configuration Framework

Variable Calibration

Calibration involves transforming variables into comprehensive conceptual categories and allocating cases to these collective groupings. Calibration approaches for both outcome and conditional variables predominantly draw upon descriptive statistical analyses, theoretical insights, and practical expertise. In line with Ragin (2009), this study employs three anchor points. "*fully in, crossover point, fully out,*" derived from the sample "*maximum, mean, and minimum values*" for calibration of variables. The resultant calibration values are detailed in Table 1.

Table 1
Calibration

Condition	Fully In	Calibration Crossover Point	Fully Out
DT	14.000	20.000	25.000
DS	12.000	20.000	24.000
DI	15.000	22.000	28.250
ST	12.000	19.000	25.000
HC	6.000	12.000	15.000
TC	9.000	12.000	15.000
IC	9.000	12.000	15.000
CC	6.750	12.000	15.000
NFP	23.000	35.000	45.000

Truth Table

The truth table exhaustively enumerated all conceivable configurations, yielding a matrix with 2^k rows, where 'k' signifies the count of outcome predictors. Each row encapsulated a distinct amalgamation of variables. In alignment with the guidance posited by Chen and Tian (2022), the criteria of case frequency and raw consistency were established at thresholds of 1 and 0.80, respectively. Moreover, the application of "*Proportional Reduction in Inconsistency (PRI) consistency*" facilitated the filtration of the

truth table (refer to Table 2). Precisely, by stipulating a PRI threshold of 0.70, the resulting truth table rows conformed to the prescribed criteria.

Table 2
Truth Table

DT	DS	DI	ST	HC	TC	IC	CC	number	NFP	raw consist.	PRI consist.	SYM consist
0	1	1	1	1	1	1	1	1	1	0.9364	0.7103	0.7149
1	0	1	1	1	1	1	1	1	1	0.9285	0.6189	0.6220
1	1	1	1	0	1	1	1	1	1	0.9245	0.6699	0.6699
1	1	1	1	1	1	1	1	14	1	0.9242	0.8136	0.8376
0	0	0	1	0	1	1	1	1	1	0.9233	0.6209	0.6209
1	0	1	1	0	1	1	1	1	1	0.9081	0.4670	0.4670
0	0	0	0	1	1	1	0	1	1	0.8799	0.4195	0.4224
1	0	1	0	0	1	1	0	1	1	0.8554	0.2543	0.2581
0	0	1	0	0	0	1	0	1	1	0.8400	0.2190	0.2220
0	0	1	0	0	0	0	0	1	1	0.8085	0.2463	0.2463
0	0	0	0	0	0	1	0	1	1	0.8034	0.2834	0.2889
1	0	0	0	0	0	0	0	2	1	0.8027	0.2678	0.2678
0	0	0	0	0	0	0	0	8	0	0.6897	0.2152	0.2225

Results and Discussion

Necessary Conditions Analysis

Utilizing the fsQCA software, we assessed the necessity conditions. As delineated in Table 3, the consistency coefficients for all conditions remained below 0.90, indicating the absence of singularly indispensable conditions for NFP. The discrete explanatory efficacy of both digitalization and DCs on NFP was limited. It underscores the imperative of adopting a configurational outlook to explain the relationships at play comprehensively.

Table 3
Analysis of Necessary Conditions

Conditions Tested	Consistency	Coverage
DT	0.7704	0.7454
~DT	0.6012	0.6309
DS	0.7526	0.8099
~DS	0.6294	0.5953
DI	0.7496	0.7358
~DI	0.5913	0.6152
ST	0.7639	0.7998
~ST	0.6002	0.5820
HC	0.7301	0.8047
~HC	0.6408	0.5938
IC	0.8074	0.7343
~IC	0.5508	0.6212
TC	0.7999	0.7431
~TC	0.5611	0.6166
CC	0.7588	0.7930
~CC	0.6238	0.6059

(~) absence of a condition

Configurational Analysis

The outcomes of the configurational analysis are detailed in Table 4. Within this analysis, eight distinct causal configurations yielding NFP exhibit a consistency metric surpassing 0.78, accompanied by raw coverage values spanning from 0.26 to 0.51. The overall solution consistency is 0.78, while the coverage rate attains 0.73. It conveys that the identified eight configurational pathways collectively represent sufficient conditions for achieving high NFP. It substantiates the model's informativeness.

In Table 4, configuration 1 underscores the interplay of factors shaping SMEs NFP. DT, DI, and IC emerge as fundamental and core conditions within this configuration, each actively contributing to NFP enhancement. The presence of these core factors highlights their indispensable roles in driving positive outcomes. Furthermore, this configuration's company of peripheral conditions (ST, TC, CC) stresses their supportive influence. While not singularly decisive, these peripheral elements contribute synergistically, further reinforcing the impact of DT, DI, and IC on NFP. This intricate network of factors reflects the multilayered nature of digitalization's effect on SMEs' NFP. The findings suggest that successful NFP attainment hinges on the effective orchestration of core and peripheral factors (Tahir et al., 2018). Organizations that prioritize DT, DI, and IC while leveraging the supportive potential of ST, TC, and CC stand to benefit from an optimized configuration that maximizes NFP.

Table 4
Analysis of Sufficient Conditions for Non-Financial Performance (NFP)

Input Variable	Configuration/Solution (S)							
	S_1	S_2	S_3	S_4	S_5	S_6	S_7	S_8
Digitalization								
Digital Transformation (DT)	●	⊗	⊗		●	⊗	●	⊗
Digital Servitization (DS)		⊗	⊗	●	⊗	⊗	⊗	⊗
Digital Innovation (DI)	●	●		●	⊗	⊗	●	⊗
Smart Technologies (ST)	●	⊗	⊗	●	⊗	⊗	⊗	●
Digital Capabilities								
Human Capabilities (HC)		⊗	⊗	●	⊗	●	⊗	⊗
Innovation Capabilities (IC)	●		●	●	⊗	●	●	●
Technical Capabilities (TC)	●	⊗	⊗	●	⊗	●	●	●
Collaboration Capabilities (CC)	●	⊗	⊗	●	⊗	⊗	⊗	●
Raw Coverage	0.5071	0.3005	0.3340	0.4862	0.3099	0.2780	0.2674	0.2711
Unique Coverage	0.0274	0.0098	0.0080	0.0169	0.0138	0.0087	0.0076	0.0111
Consistency	0.9053	0.7992	0.7853	0.9232	0.8027	0.8799	0.8554	0.9233
Overall Solution Coverage	0.7287							
Overall Solution Consistency	0.7844							

Note: ● = "presence of core condition"; ● = "presence of peripheral condition'; ⊗ = "absence of peripheral condition"; Blank Space = "Do not care".

Within configuration 2, DI is a core condition significantly associated with NFP enhancement. The presence of DI underlines its importance in driving favorable NFP outcomes, signifying its potential as an influential catalyst for SME performance improvement. Interestingly, the absence of other variables (DT, DS, ST, HC, TC, CC) introduces an intriguing dimension. While absent in this configuration, these variables may still hold relevance for NFP, although with less clarity in their roles. The lack of direct presence in this configuration does not necessarily negate their impact; instead, it suggests a more nuanced relationship. This finding underscores the context-dependent nature of digitalization's influence on SMEs' NFP. It implies that while DI exhibits direct importance, other variables may contribute indirectly or interactively to NFP (Liao et al., 2019), yet their distinct roles remain to be fully expounded.

In configuration 3, IC is a significant core condition associated with improved NFP. It highlights IC's potential as a critical enabler for enhancing SMEs' NFP. Notably, this configuration's non-presence of DT, ST, DS, HC, TC, and CC introduces complexity. While these variables are not directly present, their potential influence on NFP remains unclear. This configuration implies that IC's impact on NFP might be influenced by the presence or absence of other variables (Jackson, 2019).

In configuration 4, there is a notable presence of both DI and IC, identified as core factors strongly correlated with enhanced NFP. It emphasizes their significant responsibilities in driving favorable performance outcomes for SMEs. Furthermore, peripheral conditions (DS, ST, TC, HC, CC) provide additional context. The supportive presence of these peripheral elements suggests a synergistic relationship, indicating that while DI and IC play foundational roles, the convergence of various capabilities further amplifies their impact. This discovery emphasizes the necessity for SMEs to allocate resources towards DI and IC while also cultivating a conducive atmosphere that facilitates the cultivation and integration of other crucial capabilities (Gaglio et al., 2022) to optimize their NFP.

Configuration 5 highlights the central importance of DT as a core component in developing SMEs' NFP while simultaneously downplaying the significance of all other peripheral aspects. The importance of DT's configuration concerning NFP is emphasized in the absence of other variables, suggesting a complex interplay between the two. This finding accentuates the significance of DT in driving positive NFP outcomes while prompting further exploration into the relation between DT and the absent factors for a comprehensive understanding of SMEs' performance enhancement in the digital era (Algumzi, 2022).

Configuration 6 accentuates the central role of IC as a core determinant, supported by the peripheral presence of HC and TC, in shaping the NFP of SMEs. The noteworthy absence of other variables (ST, DS, DI, DT, CC) as peripheral contributors offers a distinctive vantage point. This configuration underscores IC's fundamental significance, synergistically supported by HC and TC, in propelling positive NFP outcomes (Neubert, 2018).

Configuration 7 sheds light on the pivotal roles of DT, DI and IC as core prerequisites for shaping SMEs' NFP. The presence of TC as a peripheral factor further fortifies this influence. Significantly, the absence of other variables (ST, DS, HC, CC) in peripheral capacities introduces a compelling perspective. This configuration emphasizes the impact of DT, DI, and IC on NFP, synergistically strengthened by TC. The non-presence of the other variables emphasizes a distinctive interplay, where the identified core-peripheral constructs emerge as pivotal determinants. This finding prompts a deeper exploration of the tricky relationships between the absent variables and the core-peripheral factors, fostering a finer comprehension of the collective mechanisms shaping SMEs' NFP. It implies that directing attention towards the interrelationships among DT, DI, IC, and TC holds promise for devising holistic strategies to enhance SMEs' NFP (Ullah et al., 2023).

Configuration 8 elucidates the foundational prominence of IC as a core imperative, fortified by the supplementary presence of ST, TC and CC in sculpting the setting of NFP within SMEs. The conspicuous absence of other variables (DT, DS, DI, HC) from their peripheral roles is noteworthy, which introduces an observant perspective. This configuration emphasized IC's pivotal centrality in influencing NFP, with the amplifying contributions of ST, TC, and CC acting in concert. The non-presence of the other variables emphasizes a distinct interplay spanning the identified core-peripheral constructs. This discovery instigates a profound exploration of the configurations between the absent variables and the core-peripheral factors, illuminating how these dynamics collectively delineate SMEs' NFP. The proposition emerges that directing attention toward the interplay between IC and the collaborative peripheral facets can furnish a comprehensive strategy (Ullah et al., 2023) to elevate SMEs' NFP

IC emerges as a consistent component across six solutions within the spectrum of the eight configurations (solutions), while DI manifests in 4 solutions. It underscores the pivotal role of innovation-related factors in influencing SMEs' NFP. Notably, the prevalence of IC in a more significant proportion of solutions highlights its substantial impact on NFP enhancement, substantiating its significance in the SME context. Moreover, among the eight solutions, solutions 1 and 4 stand out as potential optimal solutions. This distinction is

attributed to their elevated raw coverage, signifying their broader explanatory power across various scenarios. This finding suggests that the amalgamation of conditions within solutions 1 and 4 condenses a comprehensive range of factors contributing to favorable NFP outcomes for SMEs. These solutions offer a more encompassing strategic pathway for SMEs aiming to enhance their NFP, providing a delicate framework to navigate the complexities of the digital setting. Moreover, every dimension of digitalization and DCs is present in at least one configurational solution. Thus, H_1 and H_2 are accepted. Besides, Figure 3 visually represents all the solutions in a graphical format.

Conclusion

In an era characterized by rapid technological advancements, the integration of digitalization within SMEs has redefined their operational paradigms. This transformative journey offers a conduit for growth, innovation, and strategic improvement, shaping the environment of SMEs' NFP. Through a comprehensive investigation encompassing diverse dimensions of digitalization and DCs, this study has ventured to illuminate the complex configurations that underlie the path from "Pixels to Profits," where digital interactions metamorphose into tangible financial gains. With the multifaceted dimensions of digitalization and DCs, the study embarked on a configurational analysis journey through fsQCA. This analytical approach has elucidated distinct configurations that synergistically shape SMEs' NFP, recognizing the non-linear relationships underpinning their digital journeys.

The study's findings have shown a range of configurations, each providing insight into the core and peripheral circumstances that shape the NFP. Configuration 1 prioritized the significance of DI, DT and IC, supported by TC, ST and CC, to improve NFP. Configuration 2 emphasized the crucial importance of DI as a fundamental condition, which may have interactions with other variables. Configuration 3 underscored the relevance of the IC, which is intricately connected to the presence or absence of other variables. Configuration 4 demonstrated the impact of DI and IC, which was strengthened by peripheral circumstances. Configuration 5 spotlighted DT's central role in NFP, while configurations 6, 7, and 8 offered nuanced insights into IC, DT, DI, and their collaborative implications. Amidst these configurations, the prominence of IC across solutions and the consistent presence of DI emphasized their pivotal roles in influencing SMEs' NFP. Furthermore, solutions 1 and 4 emerged as potent avenues for NFP optimization, distinguished by their expansive explanatory power across scenarios.

As SMEs tread the path from "Pixels to Profits," this research provides a compass that guides them through the digital alchemy necessary to thrive in a competitive business ecosystem. In a digital age, this study contributes actionable insights that empower SMEs to harness the transformative probability of digitalization and capabilities. As Pakistani SMEs embrace these insights, they are poised to excel within the domestic market and carve a distinct niche within the global digital setting, ensuring sustainable growth and enduring excellence.

The findings from the configurations present a wealth of implications for fostering SMEs' excellence through digital alchemy. Firstly, recognizing the pervasive influence of DT, policy interventions should advocate for an ecosystem conducive to DT adoption. Policymakers can facilitate this by offering incentives for SMEs to embark on digitalization journeys, promoting digital literacy programs, and providing access to technology infrastructure. The centrality of DT in numerous configurations underscores its potential to be a catalyst for broader positive impacts on NFP, necessitating proactive efforts to create an enabling digital environment. Secondly, the pivotal role of IC in driving NFP enhancement requires policies that nurture innovation ecosystems. Collaborative initiatives among SMEs, research institutions, and industry players can foster knowledge exchange, skills development, and technology diffusion. By prioritizing innovation-oriented policies,

governments can stimulate a culture of continuous improvement and strategic innovation, aligning with the intrinsic significance of IC as a core condition in various configurations. Furthermore, the prominence of DI suggests that policies should encourage SMEs to invest in research and development activities that foster innovative solutions. Governments can provide grants, subsidies, and tax incentives to support DI initiatives, enhancing SMEs' capacity to create novel digital products, services, and processes. Moreover, the multifaceted role of CC and TC across configurations accentuates the need for policies that facilitate collaboration networks and skill development. Lastly, the consistent presence of IC in numerous configurations signals the need for targeted approaches to cultivate a conducive environment for fostering innovation-driven growth. Policymakers can encourage SMEs to prioritize skill development, technology absorption, and innovation capacity-building. By promoting innovation ecosystems, governments can create a foundation that empowers SMEs to lead in a dynamic digital landscape, thus accelerating their journey from "Pixels to Profits."

References

Algumzi, A. (2022). Impact of digital marketing on SMEs performance in Saudi Arabia: Implications on building NEOM. *Transnational Marketing Journal (TMJ)*, *10*(1), 27-38.

Alves, I., & Lourenço, S. M. (2022). The use of non-financial performance measures for managerial compensation: evidence from SMEs. *Journal of Management Control*, *33*(2), 151-187.

Anwar, M. (2018). Business model innovation and SMEs performance—does competitive advantage mediate?. *International Journal of Innovation Management*, *22*(07), 1850057.

Autio, E., Nambisan, S., Thomas, L. D., & Wright, M. (2018). Digital affordances, spatial affordances, and the genesis of entrepreneurial ecosystems. *Strategic Entrepreneurship Journal*, *12*(1), 72-95.

Baines, T., Lightfoot, H., & Smart, P. (2011). Servitization within manufacturing: Exploring the provision of advanced services and their impact on vertical integration. *Journal of manufacturing technology management*, *22*(7), 947-954.

Chen, H., & Tian, Z. (2022). Environmental uncertainty, resource orchestration and digital transformation: A fuzzy-set QCA approach. *Journal of Business Research*, *139*, 184-193.

El Sawy, O. A., Kræmmergaard, P., Amsinck, H., & Vinther, A. L. (2016). How LEGO Built the Foundations and Enterprise Capabilities for Digital Leadership. *MIS Quarterly Executive, 15*(2), 141–166.

Gaglio, C., Kraemer-Mbula, E., & Lorenz, E. (2022). The effects of digital transformation on innovation and productivity: Firm-level evidence of South African manufacturing micro and small enterprises. *Technological Forecasting and Social Change*, *182*, 121785.

Hansen, B. (2019). The digital revolution–digital entrepreneurship and transformation in Beijing. *Small Enterprise Research*, *26*(1), 36-54.

Jackson, N. C. (2019). Managing for competency with innovation change in higher education: Examining the pitfalls and pivots of digital transformation. *Business Horizons*, *62*(6), 761-772.

Liao, C. W., Chen, C. H., & Shih, S. J. (2019). The interactivity of video and collaboration for learning achievement, intrinsic motivation, cognitive load, and behavior patterns in a digital game-based learning environment. *Computers & Education*, *133*, 43-55.

Martin, L., & Omrani, N. (2015). An assessment of trends in technology use, innovative work practices and employees' attitudes in Europe. *Applied Economics*, *47*(6), 623-638.

Nadkarni, S., & Prügl, R. (2021). Digital transformation: a review, synthesis and opportunities for future research. *Management Review Quarterly*, *71*, 233-341.

Neubert, M. (2018). The impact of digitalization on the speed of internationalization of lean global startups. *Technology Innovation Management Review*, *8*(5), 44-54.

Radicic, D., & Petković, S. (2023). Impact of digitalization on technological innovations in small and medium-sized enterprises (SMEs). *Technological Forecasting and Social Change*, *191*, 122474.

Ragin, C. C. (2009). *Redesigning social inquiry: Fuzzy sets and beyond*. University of Chicago Press.

Ramanathan, U., Subramanian, N., & Parrott, G. (2017). Role of social media in retail network operations and marketing to enhance customer satisfaction. *International Journal of Operations & Production Management*, *37*(1), 105-123.

Saunila, M., Nasiri, M., Ukko, J., & Rantala, T. (2019). Smart technologies and corporate sustainability: The mediation effect of corporate sustainability strategy. *Computers in Industry*, *108*, 178-185.

Sesar, V., Hunjet, A., & Primorac, D. (2021). The impact of digitalization on customer satisfaction and customer loyalty: literature review. *Economic and Social Development: Book of Proceedings*, 297-306

SMEDA (2021). *State of SMEs in Pakistan*, SMEDA

Stonehouse, G., & Snowdon, B. (2007). Competitive advantage revisited: Michael Porter on strategy and competitiveness. *Journal of Management Inquiry*, *16*(3), 256-273.

Švárová, M., & Vrchota, J. (2014). Influence of competitive advantage on formulation business strategy. *Procedia Economics and Finance*, *12*, 687-694.

Tahir, S. H., Kousar, S., Ahmed, F., & Ullah, M. R. (2021). Impact of economic freedom on air pollution: configuration analysis of Asia-Pacific region. *Environmental Science and Pollution Research*, *28*(35), 47932-47941.

Tahir, S. H., Shah, S., Arif, F., Ahmad, G., Aziz, Q., & Ullah, M. R. (2018). Does financial innovation improve performance? An analysis of process innovation used in Pakistan. *Journal of Innovation Economics & Management*, (3), 195-214.

Teece, D. J. (2007). Explicating dynamic capabilities: the nature and microfoundations of (sustainable) enterprise performance. *Strategic management journal*, *28*(13), 1319-1350.

Ullah, M. R., Tahir, S. H., Shahzadi, H., & Kamran, H. W. (2023). Digital Pathways to Success: The Transformative Power of Digitalization and Digital Capabilities on SMEs' Financial Performance. *iRASD Journal of Economics*, *5*(2), 465-485.

Zhen, Z., Yousaf, Z., Radulescu, M., & Yasir, M. (2021). Nexus of digital organizational culture, capabilities, organizational readiness, and innovation: Investigation of SMEs operating in the digital economy. *Sustainability*, *13*(2), 720.