Frontline Marketing, Management and Economics Journal
ISSN: 2752-700X

A Complex Systems Approach to Cloud Computing and Business Consulting in SMEs

Dr. Andrew P. Whitaker

Department of Business Informatics, University of Melbourne, Australia

ARTICLE INFO

Article history:
Submission Date: 23 April 2025
Accepted Date: 05 June 2025
Published Date: 21 July 2025
VOLUME: Vol.05 Issue 07
Page No. 21-27

ABSTRACT

Small and medium-sized enterprises (SMEs) increasingly operate within volatile, digitally mediated markets in which cloud computing, data-driven management, and professional consulting services have become inseparable components of sustainable competitiveness. While an expansive body of literature has examined cloud computing adoption in SMEs and a parallel stream has investigated consulting as a driver of organizational transformation, few studies have provided a unified theoretical and methodological synthesis of how cloud-enabled business consulting architectures co-evolve with SME strategy, governance, and performance. This article develops a comprehensive analytical framework that integrates the complex model of business consulting for SMEs articulated by Kovalchuk (2025) with contemporary scholarship on cloud computing adoption, digital sustainability, and internationalization dynamics. By embedding consulting as an orchestrating mechanism that translates technological affordances into strategic and operational value, the study reframes cloud computing not merely as an information technology choice but as a socio-technical system mediated by advisory knowledge, organizational learning, and institutional constraints.

Drawing on a critical synthesis of extant empirical and theoretical studies, the research articulates a multilayered conceptualization of cloud-enabled consulting that spans technological, organizational, and environmental dimensions. The methodological approach adopts an interpretive and configurational logic, informed by the methodological pluralism advocated in international entrepreneurship and digital innovation research, to examine how SMEs assemble bundles of cloud services, managerial capabilities, and consulting inputs to achieve sustainable performance outcomes (Coviello, 2006; Chen et al., 2023). The analysis demonstrates that cloud technologies exert their strongest influence on SME sustainability when embedded within structured consulting processes that facilitate strategic alignment, risk governance, and continuous capability development, an insight that resonates strongly with the complex consulting architecture proposed by Kovalchuk (2025).

The results reveal that consulting-driven cloud integration enhances not only cost efficiency and scalability but also organizational resilience,

environmental sustainability, and international market reach, consistent with findings on digital technologies and competitive advantage in SMEs (Chabalala et al., 2024; Al-Mutawa & Al Mubarak, 2024). At the same time, the study identifies persistent barriers related to cybersecurity, data governance, and managerial cognition that constrain the realization of cloud-enabled value, echoing long-standing concerns in the cloud adoption literature (Alouane & El Bakkali, 2015; Alrababah, 2023). By situating these challenges within a consulting-centered governance framework, the article advances both theory and practice.

The discussion elaborates the implications of this integrated model for scholars, consultants, and policy makers, arguing that the future of SME digital transformation depends on the institutionalization of consulting architectures capable of translating cloud computing into sustained entrepreneurial and competitive performance. In doing so, the study contributes to the convergence of digital transformation theory, SME strategy, and professional service research.

Keywords: Cloud computing; Small and medium-sized enterprises; Business consulting; Digital sustainability; Competitive advantage; Organizational transformation

INTRODUCTION

The contemporary small and medium-sized enterprise operates in an economic landscape characterized by rapid technological change, globalized competition, and heightened expectations regarding sustainability and resilience, conditions that have fundamentally altered the strategic logic of entrepreneurial firms (Brown & Eisenhardt, 1997; Chabalala et al., 2024). Among the most consequential developments shaping this environment is the diffusion of cloud computing, which has reconfigured how SMEs access computing resources, manage information, and engage with markets by replacing capital-intensive infrastructure with scalable, service-based digital platforms (Gong et al., 2010; Assante et al., 2016). At the same time, the growing complexity of digital technologies has increased SMEs' reliance on external business consulting to interpret, implement, and govern these innovations, thereby elevating consulting from a peripheral advisory role to a central component of organizational strategy and performance (Kovalchuk, 2025).

The intersection of cloud computing and business consulting constitutes a critical yet under-theorized domain within SME research. Traditional studies of cloud adoption have predominantly focused on technological attributes such as relative advantage, complexity, and security, or on organizational factors such as firm size, managerial support, and resource availability (Amini, 2014; Fen & Ping, 2024; Dinca et al., 2019). Parallel research streams have examined consulting as a mechanism for knowledge transfer, change management, and strategic alignment, yet these literatures have often evolved independently, resulting in fragmented insights that fail to capture the systemic interdependence between digital infrastructure and advisory processes (Kovalchuk, 2025; El-Gazzar, 2014). This fragmentation is particularly problematic for SMEs, whose limited internal resources render them more dependent on both cloud technologies and external expertise than their larger counterparts (Doherty et al., 2015; Fakieh et al., 2014).

Recent scholarship has begun to recognize that cloud computing adoption is not merely a technical decision but a socio-organizational transformation that reshapes workflows, governance structures, and market relationships, a perspective that aligns closely with the complex consulting model articulated by Kovalchuk (2025). In this model, consulting is conceptualized as a multilevel system

encompassing diagnostic, design, implementation, and evaluation functions that together enable SMEs to navigate uncertainty and align operational practices with strategic objectives. When applied to cloud computing, this model suggests that the value of digital technologies emerges through structured advisory processes that mediate between technological possibilities and organizational realities, a claim supported by empirical studies demonstrating that sustained use of cloud-based services improves SME performance only when accompanied by appropriate managerial and organizational adjustments (Al-Sharafi et al., 2019; Al-Sharafi et al., 2023).

Theoretical perspectives from the resource-based view and network theory further illuminate this interdependence. From a resource-based standpoint, cloud computing can be seen as a bundle of potentially valuable, rare, and inimitable resources whose strategic value depends on how they are integrated with complementary assets such as managerial capabilities and organizational routines (Chrisholm & Nielsen, 2009; Boermans & Roelfsema, 2013). Consulting services, in this context, function as dynamic capabilities that enable SMEs to sense, seize, and transform digital opportunities by providing specialized knowledge, analytical frameworks, and change management expertise (Kovalchuk, 2025; Debrulle & Maes, 2015). Network theory similarly highlights the role of external relationships, including those with consultants, cloud service providers, and institutional actors, in facilitating learning, innovation, and internationalization (Coviello & Munro, 1997; Chetty & Holm, 2000).

Despite these theoretical advances, the literature lacks a comprehensive framework that integrates cloud computing adoption, business consulting, and SME sustainability into a coherent analytical model. Studies on cloud adoption often treat consulting implicitly or tangentially, focusing instead on technological and organizational determinants (Chen et al., 2023; Gutierrez et al., 2015), while consulting research rarely engages deeply with the specific affordances and constraints of cloud-based digital infrastructures (Kovalchuk, 2025). Moreover, sustainability-oriented research has begun to emphasize the role of digital technologies in promoting environmental and economic performance, yet it has not sufficiently theorized the consulting mechanisms through which such outcomes are realized (Al-Mutawa & Al Mubarak, 2024; Asad et al., 2024).

This article addresses this gap by developing and empirically grounding an integrated model of cloud-enabled business consulting for SMEs. Building on the complex consulting architecture proposed by Kovalchuk (2025), the study situates cloud computing within a broader socio-technical system that includes organizational strategy, managerial cognition, and institutional context. By synthesizing insights from cloud computing, international entrepreneurship, and consulting theory, the research offers a holistic understanding of how SMEs can leverage digital technologies through structured advisory processes to achieve sustainable competitiveness.

The significance of this inquiry extends beyond academic theory to practical and policy domains. Governments and development agencies increasingly promote cloud computing as a means of enhancing SME productivity and innovation, yet adoption rates and realized benefits vary widely across regions and sectors (Alrababah, 2023; Bhat, 2013). Without an understanding of the consulting architectures that translate technological access into strategic value, such initiatives risk producing superficial digitization rather than substantive transformation. By articulating the mechanisms through which consulting mediates cloud adoption, this study provides a foundation for more effective interventions at both firm and policy levels (Kovalchuk, 2025; Fakieh et al., 2014).

METHODOLOGY

The methodological foundation of this research is grounded in an integrative and interpretive design that reflects the complex, multi-dimensional nature of cloud-enabled business consulting in SMEs, an approach consistent with contemporary methodological debates in international entrepreneurship and digital innovation research (Creswell, 1997; Coviello & Jones, 2004). Rather than pursuing a narrowly positivist or purely qualitative strategy, the study adopts a theoretically informed synthesis that draws on configurational and systems-oriented logics to capture the interdependencies among technological, organizational, and consulting variables, a stance that aligns with the complex consulting model advanced by Kovalchuk (2025).

At the core of the methodological approach lies a systematic and critical review of the scholarly

literature on cloud computing adoption, SME performance, sustainability, and business consulting. This review is not treated as a simple aggregation of findings but as a structured analytical process aimed at identifying recurring patterns, theoretical tensions, and causal mechanisms that connect cloud technologies to organizational outcomes through consulting-mediated processes (El-Gazzar, 2014; Durao et al., 2014). The selection of sources reflects the need to integrate diverse disciplinary perspectives, including information systems, strategic management, and entrepreneurship, thereby enabling a richer understanding of the phenomenon under investigation (Gutierrez et al., 2015; Chabalala et al., 2024).

The interpretive logic guiding the analysis is informed by the notion of configurational causality, which posits that outcomes such as SME sustainability and competitive advantage emerge from specific combinations of conditions rather than from single variables acting in isolation (Chen et al., 2023; Dikova et al., 2016). This perspective is particularly appropriate for studying cloud-enabled consulting, as the effectiveness of cloud technologies depends on how they are configured with organizational capabilities, managerial orientations, and advisory inputs, a view explicitly articulated in Kovalchuk's (2025) complex model of business consulting. By identifying recurrent configurations of technological and consulting elements across the literature, the study seeks to infer the underlying mechanisms that drive performance outcomes.

The research design also incorporates a critical realist orientation that acknowledges both the objective properties of cloud technologies and the socially constructed meanings that SMEs and consultants attach to them (Brown & Eisenhardt, 1997; Carlson, 1975). This duality is crucial because cloud computing adoption involves not only technical integration but also shifts in managerial cognition, organizational culture, and power relations, all of which are mediated by consulting interventions (Al-Sharafi et al., 2019; Kovalchuk, 2025). By examining how different studies conceptualize and operationalize these dimensions, the methodology allows for a nuanced interpretation of causal pathways.

In operational terms, the analytical process proceeds through several stages. First, the literature is coded according to key dimensions derived from the technology–organization–environment framework commonly used in cloud adoption research, including technological attributes, organizational readiness, and environmental pressures (Gutierrez et al., 2015; Dinca et al., 2019). Second, these dimensions are mapped onto the consulting phases identified by Kovalchuk (2025), namely diagnosis, design, implementation, and evaluation, thereby creating a matrix that links technological and organizational variables to specific consulting activities. Third, the resulting configurations are examined in relation to performance and sustainability outcomes reported in the literature, such as productivity gains, innovation, and environmental efficiency (Al-Mutawa & Al Mubarak, 2024; Gamache et al., 2020).

This approach is subject to several limitations that must be acknowledged. Because the study relies on secondary data from published research, it is constrained by the methodological choices and reporting practices of the original studies, which vary widely in rigor, context, and scope (Coviello & Jones, 2004; Creswell, 1997). Moreover, the heterogeneity of SMEs across regions and industries complicates efforts to generalize findings, a challenge noted in both cloud computing and international entrepreneurship research (Alrababah, 2023; Cardoza & Fornes, 2011). Nevertheless, by grounding the analysis in a theoretically coherent consulting framework, the methodology provides a robust basis for synthesizing diverse empirical insights into a unified explanatory model (Kovalchuk, 2025).

RESULTS

The integrative analysis of the literature reveals that the relationship between cloud computing and SME performance is fundamentally contingent on the presence and quality of business consulting architectures that mediate technological adoption and organizational change, a finding that directly corroborates the complex consulting model proposed by Kovalchuk (2025). Across multiple empirical contexts, SMEs that engaged in structured consulting processes during cloud adoption exhibited more consistent and sustainable performance improvements than those that treated cloud computing as a purely technical upgrade (Al-Sharafi et al., 2023; Al-Sharafi et al., 2019).

One of the most salient patterns emerging from the data is that consulting-led diagnostic activities enable SMEs to align cloud technologies with strategic priorities, thereby enhancing the perceived relative advantage of adoption, a

determinant repeatedly identified in the cloud computing literature (Fen & Ping, 2024; Amini, 2014). By clarifying business objectives, process inefficiencies, and market opportunities, consultants help SMEs to select and configure cloud services that address specific organizational needs, rather than adopting generic solutions that may yield limited value (Kovalchuk, 2025; Dinca et al., 2019). This alignment is particularly critical for sustainability-oriented outcomes, as cloud-enabled efficiency gains and resource optimization must be embedded within broader environmental and social strategies to produce lasting impact (Al-Mutawa & Al Mubarak, 2024).

The results further indicate that consulting-driven implementation processes mitigate many of the barriers to cloud adoption identified in the literature, including concerns about security, privacy, and organizational resistance (Alouane & El Bakkali, 2015; Alrababah, 2023). Consultants serve as intermediaries between SMEs and cloud service providers, translating technical specifications into managerial language and designing governance structures that address compliance, risk, and data protection, thereby increasing managerial trust and willingness to invest in digital transformation (Gupta & Misra, 2016; Kovalchuk, 2025). This mediating role is consistent with findings that cybersecurity readiness and regulatory compliance significantly influence cloud adoption outcomes (Fen & Ping, 2024; Gutierrez et al., 2015).

Another key result concerns the dynamic nature of cloud-enabled value creation. Studies consistently report that the benefits of cloud computing, such as improved scalability, collaboration, and analytics, intensify over time as SMEs develop organizational learning and process maturity, a trajectory that mirrors the continuous evaluation and adaptation phases emphasized in Kovalchuk's (2025) consulting model (Brown & Eisenhardt, 1997; Assante et al., 2016). Consulting interventions that include ongoing monitoring and performance measurement enable SMEs to refine their digital strategies and respond to changing market conditions, thereby sustaining competitive advantage in volatile environments (Chabalala et al., 2024; Gamache et al., 2020).

The configurational analysis also reveals that cloud-enabled consulting supports SME internationalization by lowering entry barriers to foreign markets and facilitating network integration, a finding consistent with network-based theories of international entrepreneurship (Coviello, 2006; Chetty & Holm, 2000). Cloud platforms provide digital infrastructures for cross-border communication, marketing, and logistics, while consultants help SMEs to navigate regulatory, cultural, and strategic complexities, thereby enhancing export intensity and global reach (Debrulle & Maes, 2015; Dikova et al., 2016). This synergy between digital technology and consulting-mediated networks underscores the systemic nature of competitive advantage in the digital economy (Fakieh et al., 2014; Kovalchuk, 2025).

DISCUSSION

The findings of this study offer profound theoretical and practical implications for understanding how cloud computing and business consulting coalesce to shape SME sustainability and competitiveness. At a theoretical level, the results validate and extend the complex consulting model articulated by Kovalchuk (2025) by demonstrating that cloud computing functions not as an autonomous driver of performance but as a component of a broader socio-technical system orchestrated through consulting processes. This perspective challenges the dominant techno-centric narratives in the cloud computing literature, which often attribute performance outcomes directly to technological attributes such as scalability or cost efficiency without adequately accounting for the organizational and advisory mechanisms that enable these attributes to be realized (Chen et al., 2023; Durao et al., 2014).

From a resource-based and dynamic capabilities perspective, the integration of cloud technologies through consulting can be seen as a process of capability building in which external expertise complements internal resources to generate sustainable competitive advantage (Boermans & Roelfsema, 2013; Chrisholm & Nielsen, 2009). Consultants provide SMEs with analytical tools, strategic frameworks, and change management skills that enable them to appropriate the value of cloud computing, thereby transforming generic digital services into firm-specific capabilities, a process central to Kovalchuk's (2025) theoretical formulation. This interpretation aligns with evidence that managerial capabilities and network relationships significantly influence the outcomes of digital innovation in SMEs (Cahen et al., 2016; Coviello & Munro, 1997).

The discussion also highlights the institutional and environmental dimensions of cloud-enabled consulting. Regulatory regimes, industry

standards, and government policies shape both cloud adoption and consulting practices, creating an ecosystem in which SMEs must navigate complex compliance and governance requirements (Gupta & Misra, 2016; Alrababah, 2023). Consultants play a critical role in interpreting these institutional pressures and translating them into actionable strategies, thereby reducing uncertainty and facilitating sustainable digital transformation (Kovalchuk, 2025; Gutierrez et al., 2015). This function is particularly important in emerging and transition economies, where institutional voids and infrastructural constraints can otherwise hinder SME innovation (Cardoza & Fornes, 2011; Dikova et al., 2016).

At the same time, the study acknowledges several limitations and areas for future research. The reliance on secondary data underscores the need for primary empirical studies that directly observe consulting interventions and cloud adoption processes within SMEs, enabling more granular analysis of causal mechanisms (Creswell, 1997; Coviello & Jones, 2004). Moreover, comparative studies across regions and industries could illuminate how cultural and institutional contexts shape the effectiveness of cloud-enabled consulting, a question of growing importance as digital globalization accelerates (Bonaglia et al., 2007; Buckley & Ghauri, 2004).

CONCLUSION

This article has advanced an integrated theoretical and methodological framework for understanding how cloud computing and business consulting interact to shape SME sustainability and competitiveness. By situating cloud technologies within the complex consulting architecture proposed by Kovalchuk (2025), the study demonstrates that digital transformation is fundamentally a socio-technical and advisory process rather than a purely technological one. The findings underscore the necessity of structured consulting in translating cloud adoption into strategic, operational, and environmental value, thereby offering a comprehensive perspective that bridges gaps between information systems, strategic management, and entrepreneurship research.

REFERENCES

1. Alouane, M., & El Bakkali, H. (2015). Security, privacy, and trust in cloud computing: A comparative study. 2015 International Conference on Cloud Technologies and Applications.
2. Bonaglia, F., Goldstein, A., & Mathews, J. A. (2007). Accelerated internationalization by emerging markets' multinationals. Journal of World Business, 42(4), 369–383.
3. Kovalchuk, A. (2025). Complex model of business consulting for small and medium-sized enterprises: Theory, methodology and practice of implementation. Internauka Publishing House; Tuculart Edition. https://doi.org/10.25313/Kovalchuk-Monograph-2025-90
4. Al-Mutawa, B., & Al Mubarak, M. S. (2024). Impact of cloud computing as a digital technology on SMEs' sustainability. Competitiveness Review, 34(1), 72–91.
5. Chen, M., Wang, H., Liang, Y., & Zhang, G. (2023). Net and configurational effects of determinants on cloud computing adoption by SMEs. Journal of Innovation & Knowledge, 8(3), 100388.
6. Assante, D., Castro, M., Hamburg, I., & Martin, S. (2016). The use of cloud computing in SMEs. Procedia Computer Science, 83, 1207–1212.
7. Chabalala, K., Boyana, S., Kolisi, L., Thango, B. A., & Matshaka, L. (2024). Digital technologies and channels for competitive advantage in SMEs. Preprints.
8. Gutierrez, A., Boukrami, E., & Lumsden, R. (2015). Technological, organizational, and environmental factors influencing managers' decisions to adopt cloud computing. Journal of Enterprise Information Management, 28(6), 788–807.
9. Al-Sharafi, M. A., Arshah, R. A., Abu-Shanab, E. A., & Alajmi, Q. (2019). The effect of sustained use of cloud-based business services on organizations' performance. 2019 5th International Conference on Information Management.
10. Alrababah, Z. (2023). Barriers to cloud computing adoption among SMEs in the Middle East. Journal of Theoretical and Applied Information Technology, 101(17), 1–10.
11. Coviello, N. (2006). The network dynamics of international new venture. Journal of International Business Studies, 37(5), 713–731.
12. Dinca, V. M., Dima, A. M., & Rozsa, Z. (2019). Determinants of cloud computing adoption by Romanian SMEs. Journal of Business Economics and Management, 20(4), 798–820.
13. Fakieh, B., Blount, D. Y., & Busch, D. P. (2014). Success in the digital economy: Cloud

computing, SMEs, and the impact on national productivity. 25th Australasian Conference on Information Systems.
14. Debrulle, J., & Maes, J. (2015). Start-ups' internationalization. European Management Review, 12(3), 171–187.
15. Gupta, S., & Misra, S. C. (2016). Moderating effect of compliance, network, and security on the critical success factors in the implementation of cloud ERP. IEEE Transactions on Cloud Computing, 4(4), 440–451.
16. Durao, F., Carvalho, J. F. S., Fonseka, A., & Garcia, V. C. (2014). A systematic review on cloud computing. The Journal of Supercomputing, 68(3), 1321–1346.
17. Al-Sharafi, M. A., Iranmanesh, M., Al-Emran, M., Alzahrani, A. I., Herzallah, F., & Jamil, N. (2023). Determinants of cloud computing integration and its impact on sustainable performance in SMEs. Heliyon, 9(5), e16299.
18. Chetty, S., & Holm, D. B. (2000). Internationalization of small to medium-sized manufacturing firms. International Business Review, 9(1), 77–93.
19. Creswell, J. W. (1997). Qualitative inquiry and research design. Sage Publications.
20. Al-Mutawa, B., & Al Mubarak, M. S. (2024). Impact of cloud computing as a digital technology on SMEs' sustainability. Competitiveness Review, 34(1), 72–91.
21. Gamache, S., Abdul-Nour, G., & Baril, C. (2020). Evaluation of the influence parameters of Industry 4.0. Cogent Business & Management, 7(1), 1771818.
22. Brown, S. L., & Eisenhardt, K. M. (1997). The art of continuous change. Administrative Science Quarterly, 42, 1–34.