© AUG 2024 | IRE Journals | Volume 8 Issue 2 | ISSN: 2456-8880
DOI: https://doi.org/10.64388/IREV8I2-1714495

DevOps as a Catalyst for Digital Transformation: A Strategic Business Administration Framework for Resilient and Scalable Enterprises

OLOWO-IGBASAN GBEMISOLA ADEDOYIN
Federal University of Technology Akure (FUTA)

Abstract*—DevOps has continued to attract interest as an organisational practice that can support digital transformation, but the literature on its strategic and organisational effects remains incomplete. This paper explores DevOps as a driver of digital transformation by integrating empirical evidence on its impact on organisational resilience and scalability. The study presents a focused integrative review strategy for analyzing selected empirical and empirically based studies, drawing on peer-reviewed literature across business administration, management, and information systems. The results indicate a pattern of findings that DevOps implementation is linked to improvements in operational performance, deployment time, system reliability, and organisational agility across sectors such as healthcare, energy, cloud-based systems, and enterprise systems. The synthesis also shows that Leadership commitment, cross-functional cooperation, and strategic alignment are the most effective when used together with DevOps to support digital transformation. The roles and governance structures of organisations, including the incorporation of business analysts into DevOps teams, are revealed to enhance the translation of technical practice into quantifiable business value. Moreover, maturity in DevOps is closely associated with resiliency outcomes such as shorter recovery times, less downtime, and greater scalability. This research adds to the business administration and management literature by summarising scattered empirical evidence and presenting DevOps as a strategic organisational capability rather than a technical methodology. The paper can provide practical advice to managers aiming to use DevOps to enable sustainable digital transformation, as well as to emphasise the need for future empirical studies, especially large-scale and longitudinal research on DevOps-enabled organisational performance.

***Keywords:* DevOps, Digital Transformation, Organisational Resilience, Scalability, Strategic Management, Business Administration**

I. INTRODUCTION

DevOps has gradually become more than a technical approach to software development, it is currently being viewed as an organisational strategy with major consequences on enterprise performance and competitiveness (Sambamurthy, Bharadwaj, & Grover, 2003). DevOps can help organisations respond quickly to market shifts, minimise operational inefficiencies, and increase service reliability by developing and automating operations, implementing cross-functional cooperation, and continuous feedback (Dikert, Paasivaara, and Lasssenius, 2016; Lwakatare, Kuvaja, and Oivo, 2019). In modern organizations that release their business activities in a dynamic technology-driven environment, these abilities play the key role in the realization and maintenance of digital transformation (Vial, 2019). In spite of the heavy investments in digital technologies, structural rigidity, cultural resistance, and the lack of alignment between the business strategy and the technological implementation have remained the primary complication in digital transformation initiatives of many organisations (Hess, Matt, Benlian, and Wiesbock, 2016; Warner and Wäger, 2019). These issues have increased the scholarly and managerial interest in the organisational practices that assist in agility, resilience, and scalability. DevOps has been mentioned more and more as a possible facilitator of such results (Chen, 2017; Jabbari, bin Ali, Petersen, and Tanveer, 2018), but the empirical evidence of its strategic and organisational impact is still scattered in information systems, operations management and organisational research.

Research on DevOps in the existing empirical literature takes various perspectives, uses different constructs, contexts, and methodological approaches (Senapathi, Buchan, and Osman, 2018; Wiedemann, Forsgren, Wiesche, and Gewald, 2021). But these findings are scattered and not synthesized together, so they cannot make much cumulative contribution to the field of knowledge of business administration. This makes managers and scholars struggle to comprehend the operation of DevOps as a driver of digital transformation and its relevance to

organisational resilience and scalability on an enterprise level. To address this shortcoming, this paper presents a targeted integrative review of a set of empirical studies to summarize the available findings in DevOps-enabled digital transformation. This will be aimed at generalizing empirical knowledge, pinpointing prevailing themes and associations, and explaining the strategic applicability of DevOps in business administration and management literature. In this way, the research specifically adds the evidence-based insight into DevOps as a managerial and organisational capability, and not a technical practice (Fitzgerald and Stol, 2017).

II. THEORETICAL BACKGROUND AND CONCEPTUAL FOUNDATIONS

The paper is based on existing organisational and management theories explaining the development, deployment and maintenance of strategic capabilities of firms based in changing environments. The Resource-Based View (RBV) offers a baseline perspective since it frames DevOps as a firm-specific asset that combines the human, technological, and organisational resources to create a competitive advantage (Barney, 1991; Wade and Hulland, 2004). In this view, DevOps practices which include continuous integration, automation, and shared workflows are desirable, not easy to duplicate, and entrenched in organisational practices, hence contributing to the high performance results (Raphael, 2019). In addition to RBV, Dynamic Capabilities Theory can provide a more process-driven theory of how DevOps can help organisations to sense, seize, and reconfigure resources in response to environmental change (Teece, 2007; Wilden, Devinney, and Dowling, 2016). The quick experimentation, life-long learning, and adaptive decision-making processes enabled by DevOps are essential processes that help organizations live in the digital transformation of uncertain and dynamic markets (Karimi and Walter, 2015). These mechanisms aid in the organisational resilience of the organisation by increasing the capacity to absorb disruptions and continuity in operations (Burnard and Bhamra, 2011). The Technology-Organisation-Environment (TOE) model also contributes to the present study by placing the DevOps adoption in the context of the overall organisational and environmental factors (Tornatzky, Fleischer, and Chakrabarti, 1990). TOE emphasises the role of technological preparedness, organisational culture, leadership support, and outside pressures in collaborative impact on DevOps implementation and its results (Gangwar, Date, and Ramaswamy, 2015). Such a framework is especially applicable to the explanation of differences in the effectiveness of DevOps in other industries and the sizes of organisations.

In this study conceptually, DevOps adoption can be defined as the degree of institutionalisation of practices related to integrated development and operations in organisations (Leite, Rocha, Kon, Milojicic, & Meirelles, 2019). Digital transformation can be perceived as a strategic undertaking, where organisations can use digital technologies to radically revamp operations and value creation (Vial, 2019; Westerman, Bonnet, and McAfee, 2014). Organisational resilience is described as the ability to survive and adapt to disruptions (Lengnick-Hall, Beck, and Lengnick-Hall, 2011) whereas scalability is a characteristic that implies the possibility of growing and adapting operations in an efficient manner (Bondi, 2000). All these constructs put into perspective the empirical synthesis and DevOps is presented as a strategic enterprise transformer.

III. METHODOLOGY

This paper assumes a narrow integrative review design. The integrative review is suitable since it will enable to synthesize both empirical and mixed-methods literature that discusses DevOps as an organisational and strategic practice in different industries and contexts. Since the scope and page limit of this paper were rather limited, it was not possible and necessary to conduct a full systematic review. However, rather, the integrative approach allows focusing on a specific but rigorous study of the selected studies offering empirical or empirically based knowledge about DevOps-facilitated digital transformation, resilience, and scalability. Scopus, Web of science, and ScienceDirect were to be used as the main databases in the literature search as they offer the high-quality journals in the field of business, management and information systems. Google Scholar was employed supportively to find more related peer-reviewed studies that cannot be found in the main databases. The search involved the use of a combination of the keywords and Boolean operators such as: DevOps adoption AND digital transformation, DevOps practices AND

organisational performance, CI/CD AND enterprise agility, and Devops AND resilience OR scalability. The period was restricted to 2015/2023 to be able to reflect upon the new tendencies. Only subject areas that were pertinent to the business administration, management, information systems and operations management were searched. The studies were accepted provided they (1) discussed DevOps or a similar practice, (2) provided empirical results or empirically informed studies, and (3) discussed the outcomes of organisational and strategic or digital transformation. There were filters on purely technical, opinion-based, and non-peer-reviewed publications. Eight high-relevance studies were obtained as the result of this process and analysed thematically to find common empirical patterns and strategic implications.

IV. RESULTS

Summary of Included Studies

No.	Author(s) & Year	Country / Industry	Research Method	DevOps Construct(s) Studied	Outcome Variable(s)	Key Empirical Finding
1	Vishnu Vardhan Reddy Boda (2023)	USA / Healthcare (Optum)	Case Study (Qualitative)	• DevOps Adoption & Culture• CI/CD Pipelines• Infrastructure as Code (IaC)• Microservices & Cloud	• Operational Efficiency• Patient Care Quality• Innovation Speed• System Reliability & Security	DevOps transformation at Optum streamlined operations, accelerated software delivery, improved cross-functional collaboration, enhanced patient data management, and strengthened system reliability and security, resulting in a clear competitive advantage in healthcare technology.
2	Md Hasan Zamil et al. (2023)	USA / Multi-Industry (Theoretical)	Systematic Literature Review (PRISMA)	• Business Analyst (BA) Role in DevOps• BA Integration in Agile/DevOps Teams• Value Stream Mapping	• Project Success Rate• Stakeholder Alignment• Return on Investment (ROI)• Digital Transformation Outcomes	Certified Business Analysts play a critical strategic role in DevOps and agile environments by improving requirement

						clarity, reducing rework, accelerating time-to-value, and enhancing overall project success and digital transformation effectiveness.
3	Tanzeeem Ahmad et al. (2022)	USA, Ghana / Multi-Industry	Mixed-Methods (Framework Development & Case Analysis)	• Digital Transformation Roadmap• DevOps and Agile Enablement• Change Management Practices	• Transformation Success• Operational Efficiency• Competitive Advantage	Effective digital transformation requires strategic alignment, leadership commitment, stakeholder engagement, and a phased roadmap. DevOps and agile practices serve as key enablers by supporting iterative delivery, flexibility, and continuous improvement.
4	Nivedhaa N (2023)	India / IT & Cloud Services	Comparative Evaluation Study	• DevOps Tools for Cloud Management• CI/CD Pipelines• Infrastructure as Code• Monitoring & Configuration Management	• Cloud Management Efficiency• Operational Agility• Security & Compliance	The study shows that successful cloud management through DevOps depends on selecting appropriate tools and integrating best practices such as IaC and DevSecOps, leading to improved automation,

						agility, security, and compliance in cloud environments.
5	Sumanth Tatineni (2021)	USA / IT & Software Development	Conceptual Study / Literature Review	• DevOps Lifecycle (7Cs)• Continuous Integration & Delivery (CI/CD)• Automation• Collaboration• Monitoring & Toolchains	• Operational Efficiency• Software Delivery Speed• Product Quality• Innovation Capability	DevOps improves the entire software development lifecycle through continuous practices, automation, and collaboration, resulting in faster delivery cycles, reduced errors, enhanced system reliability, and sustained innovation.
6	Zafer Ali & Henrietta Nicola (2018)	Global / Cross-Industry (Enterprise Systems)	Conceptual Framework Analysis	• AI-Driven DevOps & DataOps• Cloud-Native Architecture• CI/CD Pipelines• Intelligent Automation	• Agility• Scalability• Operational Efficiency• Innovation• Digital Transformation Performance	The integration of artificial intelligence with cloud-native DevOps and DataOps significantly accelerates digital transformation by improving automation, enabling real-time decision-making, and enhancing enterprise scalability and agility.
7	Satish Reddy Goli (2020)	Global / Energy Sector	Mixed-Methods (Case Studies & Secondary	• DevOps Adoption• Cloud Computing•	• Operational Efficiency• Deployment Frequency•	DevOps and cloud adoption modernise

			Data Analysis)	CI/CD Practices• Microservices & Containerisation	System Downtime• Scalability• Cost Efficiency	energy sector operations by increasing deployment frequency, reducing system downtime, improving scalability, lowering operational costs, and supporting sustainable, real-time infrastructure management.
8	Aruna Ravichandran, Kieran Taylor & Peter Waterhouse (2016)	Global / Cross-Industry (Banking, Retail, Automotive, Technology, Public Sector)	Mixed-Methods (Case Studies, Surveys, Industry Reports, Expert Interviews, ROI Analysis)	• DevOps Adoption & Maturity• Culture & Collaboration• Automation & Tooling• Lean Thinking• Continuous Delivery• Agile Operations	• Deployment Frequency• Lead Time for Changes• Change Failure Rate• Mean Time to Recovery (MTTR)• Customer Retention & Acquisition• Revenue & Profit Growth• Employee Satisfaction (eNPS)	High-performing DevOps organisations deploy up to 200× more frequently, achieve 2,555× faster lead times, recover 24× faster, and experience 3× lower change failure rates. Early DevOps adopters are 2.5× more likely to improve customer retention and 3.4× more likely to gain market share. DevOps maturity shows strong financial returns (e.g., 306% ROI from APM tools and 389% ROI

						from release automation) and significantly improves employee loyalty, with teams 2.2× more likely to recommend their organisation as a great place to work.

V. DISCUSSION OF FINDINGS

The studies reviewed collectively support the argument that DevOps is a strategic organisational capability rather than a technical practice. In sectors such as healthcare, energy, cloud services, and enterprise systems, the adoption of DevOps is always linked to increased operational efficiency, faster delivery, and greater organisational agility. Healthcare experience indicates that applying DevOps to combine CI/CD pipelines, cloud infrastructure, and microservices greatly simplifies workflows and improves system reliability, thereby accelerating innovation and improving the quality of services (Beda, 2023). This aligns with the dynamic capabilities school of thought, which emphasizes the constant reorganisation of organisational resources in response to environmental change.

Another noticeable commonality across the studies is the use of DevOps as an instrument of digital transformation, integrating functions and fostering cultural transformation. As per mixed-method studies aligned with leadership commitment and change management, DevOps practices make it easier to adopt iterative delivery and continuous improvement, which are crucial components of successful transformation initiatives (Ahmad et al., 2022). Likewise, based on experience in cloud environments, DevOps-based automation and infrastructure-as-code practices increase operational agility and improve security and compliance, thereby supporting the strategic value of DevOps in digitally intensive settings (Nivedhaa, 2023).

The evidence reviewed also highlights the equality of complementary organisational roles and governance structures in maximising DevOps results. The authors demonstrate that by incorporating business analysts into the DevOps team, requirements become clearer, stakeholders are better aligned, and the payback period is greater, thereby enhancing the connection between technical implementation and business value (Zamil et al. 2023). This conclusion adds to the current literature on DevOps by providing empirical evidence on the roles of managerial and analytical roles in the effectiveness of transformation, which aligns with the Technology-Organisation-Environment model.

In terms of performance and scale, empirical and industry-based reports consistently show significant gains in deployment frequency, lead-time savings, and system recovery capabilities among DevOps-mature organisations. Evidence from the literature shows that more frequent deployments, faster recovery after service failures, and reduced change failure rates accompany increased DevOps maturity in organisations, as do higher financial performance and employee satisfaction (Ravichandran et al., 2016). The same can be observed in the energy industry, where DevOps and cloud adoption have reduced downtime, lowered costs, and increased productivity to a greater extent in a sophisticated operating environment (Goli, 2020). These results provide clear evidence of DevOps as a resilience-enhancing capability.

Nonetheless, the review also indicates that the empirical research is unbalanced, and some influential works are conceptual or framework-based (Ali and Nicola, 2018; Tatineni, 2021). Although these studies offer important strategic implications, especially for AI-enabled DevOps and lifecycle

integration, the need for more large-scale empirical validation is noted. In general, the synthesis indicates that DevOps can have significant impacts on digital transformation, resilience, and scalability when integrated into favourable organisational structures, cultures, and strategic alignment, thereby offering valuable implications for the business administration and management scholarship.

VI. IMPLICATIONS OF THE STUDY

The results of this research have great implications for theory, practice, and policy in business administration. In theory, the study reinforces DevOps's place as a strategic organisational capability by expanding the existing framepoints, including the Resource-Based View and Dynamic Capabilities Theory, by showing that DevOps facilitates the continuous reconfiguration of resources in digitally turbulent contexts. It also highlights the significance of organisational roles, governance, and culture in mediating DevOps outcomes, thereby enabling the technology-organisation interaction literature. At the managerial level, the research provides evidence that the successful adoption of DevOps must include more than the implementation of tools. Cross-functional cooperation, leadership dedication, and strategic alignment should be managers' top priorities to realize all the benefits of the digital transformation. The results also indicate that introducing business-related functions, including business analysts, in DevOps units increases value creation and ROI. For policymakers and organisational leaders, the paper highlights the need to establish institutional structures and digital infrastructure to support resilience and scalable expansion in technology-intensive sectors.

VII. CONCLUSION OF THE STUDY

The paper aimed to synthesize empirical evidence on DevOps as a driver of digital transformation, focusing specifically on organisational resilience and scalability. Based on a narrow integrative review of selected empirical studies, the findings reveal that DevOps consistently contributes to improved operational efficiency, agility, and system reliability across a variety of industries. More to the point, the evidence confirms that DevOps works best when integrated into the favourable organisational cultures, strategic leadership frameworks, and transformation roadmaps. Although the reviewed studies demonstrate strong performance and resilience outcomes, the synthesis also highlights gaps in large-scale, longitudinal empirical studies. However, the research contributes to the development of business administration by redefining DevOps as a management and organisational capability rather than a strictly technical practice. That way, it offers a more evidence-based rationale for how DevOps contributes to sustainable digital transformation and scalable enterprise performance in modern organisations.

REFERENCES

[1] Ahmad, T., Aakula, A., Ottori, M., & Saini, V. (2022). Developing a strategic roadmap for digital transformation. Journal of Computational Intelligence and Robotics, 2(2), 28-68.
[2] Ali, Z., & Nicola, H. (2018). Accelerating Digital Transformation: Leveraging Enterprise Architecture and AI in Cloud-Driven DevOps and DataOps Frameworks.
[3] Barney, J. (1991). Firm resources and sustained competitive advantage. Journal of Management, 17(1), 99–120.
[4] Boda, V. V. R. (2021). DevOps Driving Change at Optum: A Healthcare Transformation Story. International Journal of Emerging Research in Engineering and Technology, 2(3), 22-32.
[5] Bondi, A. B. (2000). Characteristics of scalability and their impact on performance. In Proceedings of the 2nd international workshop on Software and performance (pp. 195–203). ACM.
[6] Burnard, K., & Bhamra, R. (2011). Organisational resilience: Development of a conceptual framework for organisational responses. International Journal of Production Research, 49(18), 5581–5599.
[7] Chen, L. (2017). Continuous delivery: Overcoming adoption challenges. Journal of Systems and Software, 128, 72–86.
[8] Dikert, K., Paasivaara, M., & Lasssenius, C. (2016). Challenges and success factors for large-scale agile transformations: A systematic literature review. Journal of Systems and Software, 119, 87–108.
[9] Fitzgerald, B., & Stol, K. J. (2017). Continuous software engineering: A roadmap and agenda. Journal of Systems and Software, 123, 176–189.

[10] Gangwar, H., Date, H., & Ramaswamy, R. (2015). Understanding determinants of cloud computing adoption using an integrated TAM-TOE model. Journal of Enterprise Information Management, 28(1), 107–130.
[11] Goli, S. R. (2020). Energy Sector Modernisation: DevOps and Cloud as Catalysts for Operational Efficiency. Available at SSRN 5741642.
[12] Hess, T., Matt, C., Benlian, A., & Wiesböck, F. (2016). Options for formulating a digital transformation strategy. MIS Quarterly Executive, 15(2), 123-139.
[13] Jabbari, R., bin Ali, N., Petersen, K., & Tanveer, B. (2018). Why is DevOps so perceived as difficult? A systematic literature review. International Journal of Software Engineering and Knowledge Engineering, 28(10), 1389–1421.
[14] Karimi, J., & Walter, Z. (2015). The role of dynamic capabilities in responding to digital disruption: A factor-based study of the newspaper industry. Journal of Management Information Systems, 32(1), 39–81.
[15] Leite, L., Rocha, C., Kon, F., Milojicic, D., & Meirelles, P. (2019). A survey of DevOps concepts and challenges. ACM Computing Surveys (CSUR), 52(6), 1–35.
[16] Lengnick-Hall, C. A., Beck, T. E., & Lengnick-Hall, M. L. (2011). Developing a capacity for organizational resilience through strategic human resource management. Human Resource Management Review, 21(3), 243–255.
[17] Lwakatare, L. E., Kuvaja, P., & Oivo, M. (2019). An empirical study of DevOps: Key challenges and benefits in a large-scale Finnish telecom company. Journal of Information Technology Case and Application Research, 21(1), 4–24.
[18] Nivedhaa, N. (2023). Evaluating DevOps tools and technologies for effective cloud management. Journal ID, 2563, 4512.
[19] Raphael, A. (2019). Resource-based view of DevOps. In Strategic Management and Leadership for Systems Development in Virtual Spaces (pp. 83–102). IGI Global.
[20] Sambamurthy, V., Bharadwaj, A., & Grover, V. (2003). Shaping agility through digital options: Reconceptualizing the role of information technology in contemporary firms. MIS Quarterly, 27(2), 237–263.
[21] Senapathi, M., Buchan, J., & Osman, H. (2018). DevOps capabilities, practices, and challenges: Insights from a case study. In Proceedings of the 22nd International Conference on Evaluation and Assessment in Software Engineering (pp. 57–67). ACM.
[22] Tatineni, S. (2021). A Comprehensive Overview of DevOps and Its Operational Strategies. International Journal of Information Technology and Management Information Systems (IJITMIS), 12(1), 15-32.
[23] Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. Strategic Management Journal, 28(13), 1319–1350.
[24] Tornatzky, L. G., Fleischer, M., & Chakrabarti, A. K. (1990). The processes of technological innovation. Lexington Books.
[25] Vial, G. (2019). Understanding digital transformation: A review and a research agenda. The Journal of Strategic Information Systems, 28(2), 118–144.
[26] Wade, M., & Hulland, J. (2004). The resource-based view and information systems research: Review, extension, and suggestions for future research. MIS Quarterly, 28(1), 107–142.
[27] Warner, K. S., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. Long Range Planning, 52(3), 326–349.
[28] Westerman, G., Bonnet, D., & McAfee, A. (2014). Leading digital: Turning technology into business transformation. Harvard Business Review Press.
[29] Wiedemann, A., Forsgren, N., Wiesche, M., & Gewald, H. (2021). Research for practice: DevOps. Communications of the ACM, 64(8), 44–49.
[30] Wilden, R., Devinney, T. M., & Dowling, G. R. (2016). The architecture of dynamic capability research: Identifying the building blocks of a configurational approach. Academy of Management Annals, 10(1), 997–1076.
[31] Zamil, M. H., Jyoti, S. N., & Ikbal, M. Z. (2023). Strategic role of business analysts in digital transformation tools, roles, and enterprise outcomes. American Journal of Scholarly Research and Innovation, 2(02), 246-273.