Chapter 5
Cloud Computing's Role in Digital Transformation

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ABSTRACT

Cloud computing is a primary driver for digital transformation, driving agility, scalability, and efficiency enhancements across industries. This chapter introduces cloud computing benefits such as flexibility, cost reduction, and accelerated innovation. Cloud strategies such as Hybrid, Multi-Cloud, and a Cloud-Native approach to fit the business needs will be explored. Some industry-specific impacts concerning healthcare, finance, and manufacturing processes will be vividly brought forth. While cloud adoption is a beneficial decision, it can also pose threats such as security, compliance, and integration challenges that will be addressed through mitigation strategies. The future trends in cloud computing that will be discussed include AI-driven cloud services, Edge computing, and Serverless architectures. Real-world case studies will fortify the argument on successful practical applications as effective references for businesses to leverage cloud computing.

I. INTRODUCTION

Digital transformation is a term used to capture numerous activities such as application modernization, new models for doing business, the creation of new products and services, and more generally, the systemic synergy of company-wide priorities and emerging capabilities toward seamless digital delivery to customers (Tripathi). (Onabanjo, 2024). The processes of digital transformation are not only applicable to the public service; they are also wide-ranging and extended to healthcare, education,

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culture, and many other fields of activity (Jabborova et al., 2024). Digital transformation is made possible through a multitude of technologies deeply innovative and disruptive enough to change the way organizations function and engage with their customers while also creating and delivering value (Adama & Okeke, 2024). The path of digital transformation coincides with the emergence of never-before-seen digital technologies, mostly concerning IoT and cloud computing, which have highly affected applicable industries (Y. Liu, Ni, Karlsson, & Gong, 2021).

Cloud computing is the provision of computer services over the Internet that provide rapid change, flexibility, and economies of scale (Tripathi, 2023). In fact, cloud computing is becoming the dominant form of digital technology in the software industry, enabling the Internet-based delivery of software applications on demand and sharing at scale (Schneckenberg, Benitez, Klos, Velamuri, & Spieth, 2021). The fundamental attributes of flexibility and scalability conjugated by cloud computing allow organizations to become agile. Moving from conventional systems to cloud-based solutions allows technology integration and enables the necessary cultural and procedural changes within the organization with ease (Umar & Rana, 2024). Cloud computing is really a pivotal technology within digital transformations: Its gradual adoption into public policy and commerce has established an influential role both in technology architecture and in business models that require organizations to alter their growth strategies accordingly to fit newcomer technologies within the enterprise space (Al-Ruithe, Benkhelifa, & Hameed, 2018). Cloud computing has boundless possibilities in a fresh digital stream and will have a penetrating impact on digital transformation for good (Tripathi, 2023).

Cloud platforms enable digital transformation, providing an essential infrastructure that allows organizations to creatively and adaptively require modernity and agility (Kwaku, 2023). With cloud computing, pre-existing functions of traditional stakeholders undergo modification, while new players dawn. Such ecosystem consists of service providers, users, and other entities arising therein as a consequence of the distinctive features of the distribution model (Sean Marston, Bandyopadhyay, Zhang, & Ghalsasi, 2011). Other core benefits of cloud services in enabling digital transformation include allowing for huge cost reductions, increased operating efficiencies, flexibility, speed, scalability, and security. These benefits give reason for a business or organization to adjust its game plans according to the new demands of the digital landscape (Mydyti, Ajdari, & Zenuni, 2020).

Cloud platforms offer multiple options, and can be used to best meet the needs of each organization, as these are platforms that should be adopted by organizations of every size. The digital transformation of the organization requires the cloud in order to offer through it the infrastructure and tools necessary to generate the innovations demanded by the rapid change in the market (Kwaku, 2023). Cloud based platforms allow administrators to manage, monitor, and make changes with