

# Study on How Digital Transformation is Changing the Avenues of Service Industry

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**Abstract:** *Both manufacturing and service companies' value chain activities have been impacted by digital transformation. Through network text analysis of 330 relevant articles published over the course of the previous ten years, this study explored digital transformation in the service sector. The keyword connection relationships in the chosen publications were examined to produce network maps of study subjects, ranging from established to novel ideas of researchers. Using centrality and community analysis, dominant research subjects and their clusters were found, as well as research trends. The findings of this study will aid researchers and practitioners in related professions in gaining a comprehensive understanding of the field.*

**Keywords:** Network text analysis; Service Business: An International Journal; Research trends in the service industry

## I. INTRODUCTION

Innovation has advanced thanks to digitalization at a pace never before thought possible (Lee and Lim 2018). To enable adaptable changes in operational processes, information systems, and society at large, businesses have been implementing digitalization (Parvi-ainen et al. 2017). The business environments of many different industries have recently changed as a result of digitalization (Tronvoll et al. 2020; Kapadia and Madhav 2020). In order to supply the goods and services that customers desire, a company needs to have dynamic capabilities for agility, flexibility, and resilience (Teece 2014; Lee and Trimi 2021). If digitalization is used effectively, this can be achieved. As a result, businesses can use digital technology to continually enhance their value proposition (Coreynen et al. 2020). According to Parviainen et al. (2017) and Kamalaldin et al. (2020), digitalization is also considered as a source of organisational sustainability since it enables businesses to continuously pursue internal efficiency and external opportunity to provide value and grow their market share.

Digitalization comprises value creation for the customers after using the technology, as opposed to digitization, which only refers to using digital technologies (Seyedghorban et al. 2020). The use of digital technologies and digitised data is described as "the use of digital technologies and digitised data to impact how work gets done, transform how customers and companies engage and interact, and create new digital revenue streams" (Strnen 2020). Recently, a number of digital technologies have sparked the digitization or transformation of service businesses, which has led to growth (Gebauer et al. AI, the Internet of Things (IoT), cloud computing, and big data are key technologies for digitalization (Kretschmer and Khashabi 2020). IoT, cloud computing, and big data analytics, which are frequently regarded as the foundational technologies for digitalization, have made it possible for businesses to investigate fresh options to implement customer-oriented business models (Lee and Lim 2018; Frank et al. 2019; Paiola and Gebauer 2020). IoT has enabled a number of entities, including software and hardware, to connect over networks. The real-time data interchange between the parties offers in-depth perceptions into the material and information flows in the supply chain. Internet of Everything (IoE), another name for IoT, assists in building complex knowledge networks for value generation through real-time communication (Lee and Lim 2018). Because they enable the cost-effective storage and analysis of enormous amounts of data, cloud services are the foundation of the digital transformation (Abolhassan 2016). By 2025, the number of IoT-connected devices is anticipated to increase to more than 30 billion, according to Statista.com (2021). Modern technologies like AI and IoT are used for analysis because traditional database management systems are unable to handle huge data. Many businesses rely on big data analytics to mine the knowledge and information contained in the data gathered through multiple channels. Big data researchers are interested in

important big data analytics subjects such storage capacity, visualisation, and wireless sensor networks (Choi et al. 2017). Ardito et al. (2019) identified four clusters that represent big data analytics and management in the literature using document cogitation analysis: (1) conceptual evolution of big data analytics, (2) management transformation by big data analytics, (3) effects of big data analytics on resource management and performance, and (4) transformation of supply chain management by big data analytics. Big data analytics improve client engagement, streamline internal processes, and aid in error detection (Kretschmer and Khashabi 2020).

A growing number of studies have been published in conference proceedings and journals on the important academic issue of digital transformation in the service industry. In order to shed light on potential future directions of digital transformation in the service sector, the current study analyses the trends of the research on digital transformation by doing network text analysis on papers that have recently been presented in conferences and published in scholarly journals. By building cooccurrence matrices and displaying a network in visual form, network text analysis analyses the semantic relationships between keyword nodes (Lee and Su 2010). This study uses net work text analysis with NetMiner4.0 to examine the relationships between central research topics and keyword clusters of recently published papers on digital transformation in the service sector, in contrast to conventional studies that investigated research trends based on simple frequency analysis of research topics and methodologies used. The structure of this study is as follows. Section 2 summarises earlier research on digital transition. In Section 3, a general description of network text analysis and an analysis of the published articles on digital transformation in services that have received a lot of citations are given. The analytical findings and suggested next research areas are summarized in Section 4. Lastly, Sect. 5 outlines the consequences of the findings, the study's shortcomings, and the need for additional research.

## **II. LITERATURE REVIEW**

### **2.1 A plan for digital transformation**

Given that effective implementation of digital transformation would significantly improve organisational agility, flexibility, and resilience and lead to improved performance outcomes, it should be a key component of business strategy (Kretschmer and Khashabi 2020). An important factor in the success of the company's sales performance, for instance, has been the use of big data analytics by Amazon, which has proven to be very successful and sophisticated (Jannapureddy et al. 2019).

High-level customer collaboration is made possible by digitalization, and this collaboration may lead to the creation of new revenue streams (Scherer et al. 2017). The main advantage of online shopping is that businesses can gradually learn more about their clients without having to set up additional channels to market to them (Strmen 2020). Competitive online retailers like Amazon.com and Alibaba.com collect a tonne of data on their customers, including information on the relationship between age and access patterns or customer traits for a particular product. Kretschmer and Khashabi (2020) discovered that digitization improves consumer contact. To ensure that the transformation journey towards a comprehensive service mentality is easy, companies need to unlearn rigid product-oriented strategies and balance product and service assets (Tronvoll et al. 2020).

Companies have been able to create and use creative business models thanks to digitalization (Hokkanen et al., 2021). For both business and society, digitalization has drawn a large number of knowledge workers to perform cognitive tasks (Loebbecke and Picot 2015). Kretschmer and Khashabi (2020) claim that through the development of internal processes—which they dubbed a strategic renewal—digital transformation has influenced changes in organisational structures. The strategic reorientations of organisations should support the digital transformation process in the era of the service. Tronvoll et al. (2020) proposed identification, dematerialization, and collaboration as three shift enablers. A business can effectively transition from planning to making both short-term and long-term decisions that are most appropriate for the environment by identifying real-time information. By utilising the dematerialization made possible by digital servitization, the company may move from physical scarcity to abundance and do more with less. In a value chain, cooperation among partners enables participants to forge horizontal connections without being bound by organisational vertical links.

The process of digital transformation offers both many benefits and possible obstacles. To adapt their business models to the transformation environment, many organisations, however, struggle (Loebbecke and Picot 2015; Kretschmer and Khashabi 2020). Advanced data analytics, connectivity between goods and services, and a blending of lines between

suppliers, customers, rivals, and even marketplaces are all made possible by digitalization (Porter et al. 2014). Due to the traditionalism of many large organisations and their fear of changing their current arrangements, the transformation process often breaks down, making it challenging to create the necessary business models. Due to this, even when faced with financial constraints, adaptable and creative startups are typically more successful than their large rivals at drastically changing their business models (Loebbecke and Picot 2015). In conclusion, Kretschmer and Khashabi (2020) state that digital transformation is quickly emerging as a crucial driver of competitive advantage in the market context.

## 2.2 Digitization of services

Firms adopt a digital servitization strategy due to intense competition and technology advancements (Coreynen et al. 2020). Similar to digitalization, digital service- vitzation necessitates significant adjustments to an organization's operations and business structures (Tronvoll et al. 2020). Through digital transformation, many businesses are expanding their service offerings. A Korean startup called Mobidoo uses encrypted inaudible sound waves to provide credit card users with a safe and simple mobile payment service. Users are becoming more concerned about security concerns and conformance with international standards as more countries use digital payment systems (Mridha et al. 2017). Another illustration is the use of wearable medical devices to supply various healthcare services via smartphone apps, such as smart health trackers and blood pressure monitors (Lee and Lee 2020a). The major focus of businesses is shifting away from the products they sell and towards integrated service ecosystems, and this trend is apparent in both the manufacturing and service industries (Coreynen et al. 2020).

Digital servitization is described as "the transition towards smart product, service, and software systems that enable value creation and capture through monitoring, control, optimisation, and autonomous function" (Coreynen et al. 2020). The term "servitization" was first used by Vandermerwe and Rada in 1988. Diverse fields have adopted the servitization trend under various names, including the product-service system, the shift from products to solutions, hybrid offers, and others (Paiola and Gebauer 2020). The primary force behind servitization is digitization. Any company interested in adopting servitization, according to MartnPea et al. (2018), must first think about conducting digital transformation.

According to Sjödin et al. (2020), digital servitization is "the transformation in processes, capabilities, and offerings within industrial firms and their associated ecosystems to progressively create, deliver, and capture increased service value." To improve service quality, brand loyalty, and customer happiness, digital services trigger relational interactions with customers (Kamalaldin et al. 2020). As more people use digital technology, product-oriented businesses can now create service-oriented business models through digital servitization. Value chain stakeholders are focusing less on the product-oriented transactional model and more on the service-oriented relational arrangement in order to take advantage of digitalization (Kamalaldin et al. 2020).

There are two organisational viewpoints on digital servitization: a front-end perspective and a back-end perspective (Kryvinska et al. 2020). While back-end servitization aids in the organization's operational efficiency and enhanced resource allocation, front-end servitization facilitates deeper engagement with customers (Coreynen et al. 2017). The ability of the company to gather and analyse data is a vital resource for establishing competitive advantage in the dynamic market (Paiola and Gebauer 2020). Additionally, Coreynen et al. (2020) recommended categorising organisational efforts that are focused on discovery and those that are geared towards exploitation coupled with digital servitization. In spite of the fact that both exploitation and exploration assist digital servitization, the study found that exploration appears to be more successful when the two efforts are combined.

## III. CONCLUSION

Through network text analysis, this study pinpointed the emerging research themes in the digital transformation of the service sector. As clients expect more and more new services in the age of digital media convergence, organisations are working to become agile and adaptable to the fast-paced business environment (Lee and Lim 2018). Consequently, there have been more studies on pertinent subjects. This study employed 330 Scopus articles as the basis for its network analysis. The outcomes of the key word network-based centrality analysis can be summed up as follows. "Business Model," "Ecosystem," "Servitization," and "Customer Experience" were the subtopics in relation to digital

transformation in the service industry that were most actively researched. Businesses may work together with all of their stakeholders to co-create value thanks to digital transformation. As a result, they inevitably focus on developing new business models and managing new business ecosystems with partners and clients. Additionally, as product-oriented businesses were able to create service-oriented business models thanks to the advancement of digital technologies, they started to concentrate on digital servitization. Additionally, value generation through improved client experiences became crucial. The centrality analysis revealed that financial and healthcare services were the subjects of several studies in our research sample.

Through cluster analysis of the keyword network, the study revealed the main research areas on digital transformation in the services sector. Six groupings of the listed topics were created. Building new business environments for digitization was the focus of the first cluster. Digitalization is the process of transforming corporate processes to employ digital technologies, as opposed to digitization, which is the act of converting analogue to digital (Gobble, 2018). Numerous research (Sklyar et al. 2019; Pelletier and Cloutier 2019; Liu and Guo 2021; Endres et al. 2021) shown that digitalization in the service sector necessitates new management methods and practices, demanding considerable changes in organisational structure and culture. Studies on technologies that are frequently employed in digital transformation, primarily Industry 4.0 technologies like IoT and blockchain, were included in the second cluster. As many studies have noted (Chehri and Jeon 2019; Rosete et al. 2020; Li et al. 2020), IoT and blockchain technologies allow service providers to improve monitoring, traceability, and complete transparency over corporate processes with secure network platforms. These benefits are anticipated to cause the market sizes for fintech, digital healthcare, and other untapped services to increase significantly (Lee and Lee 2020b). The third cluster demonstrated how the COVID-19 epidemic has advanced digitalization across all spheres of society, particularly in the service sector and healthcare. In the COVID-19 age, digital healthcare is recommended as an alternative to face-to-face treatment with a virtual visit to speed up telemedicine services and avoid infection (Yamamoto 2021; Tortorella et al. 2021). This is true even if face-to-face care is essential to the present healthcare system. According to numerous studies (Bartsch et al. 2020; Agostino et al. 2021; Abdel-Basset et al. 2021) service organisations are accelerating the deployment of digital transformation to respond swiftly and decisively to the COVID-19 pandemic era with resilience. The fourth cluster emphasized how the emergence of new business models in the service sector was a result of digital transformation. Numerous research on the subject of digital servitization have also been done. Organisations can recognize, seize, and reconfigure new business prospects thanks to the creation of new innovative services through digital servitization, such as add-on services for smart product and service systems (Linde et al. 2021a). According to earlier studies (Sklyar et al. 2019; Linde et al. 2021b), digital servitization enables service organisations to provide a platform for better interactions with customers while also enhancing data gathering, storage, analysis, and utilisation. The fifth cluster dealt with the role that e-government and e-commerce played in the early stages of digital transformation in the service sector. E-government systems work to increase citizens' trust and confidence in the government by offering more responsive and effective services to the public with digital technology (Uyar et al. 2021). E-commerce has also given clients a personalised buying experience and eliminated time, place, and space limitations (Ameen et al. 2021). The articles in this cluster suggest that different managerial insights in traditional E-service are crucial and must be adjusted to be appropriate for the digital age. The financial industry's digital transformation was the topic of the final cluster. The COVID-19 crisis has sped up the digital transition, but there are still certain obstacles preventing the financial industry from adopting it, such as functional and psychological hurdles (Santos and Ponchio 2021). Functional obstacles are tied to product value and usage danger, but psychological barriers are linked to a person's tradition and social standards (Mani and Chouk 2018). Numerous studies claimed that operational excellence is crucial for maximising customer experience and security enhancement for the successful digital transformation in the financial industry, in addition to emphasising the significance of fintech and smart banking services.

This work makes a number of important contributions. First, it used just those articles with unstructured text data to quantify and analyse the study patterns of digital transformation in the service business. This study used network text analysis to pinpoint the key areas of study for the service industry's digital transformation. The systematic review of the literature on digital transformation in the service sector is lacking. Researchers in relevant subjects will be able to better understand the field as a whole thanks to the findings of this study. Second, the issue areas that require in-depth future research are identified by the research trend analysis carried out in this study. Despite the wide-ranging nature of the



service sector, a large portion of the research in our sample were concerned with healthcare and financial services, highlighting their growing significance. Our study's findings also indicated the need for additional research on the digitalization of other service sectors, including hospitality and tourism, aviation, and logistics. Additionally, a lot of research provided a succinct explanation of how COVID 19 affected the digitalization of services. It is vital to perform comprehensive research on how the post-COVID-19 age will effect digitalization in the service industry because the COVID-19 pandemic has become the new norm. In addition, more study is required on contemporary service strategies (Lee and Trimi, 2021). Additionally, Lee and Lee 2020b recommend that service organisations seek strategic innovations for new business models and "untact" technology like AI, robotics, IoT, and big data. Thus, research into customer-centric service models, the convergence of disruptive digital technologies and services, and service innovations that can foster new value and a competitive edge in the digital age are all important.

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