Mapping Of SMEs Digital Financial Transformation Research: A Bibliometric Analysis

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Abstract. With regard to keywords, research sites and topics, as well as the research methodologies, this study intends to carefully assess international scientific articles for SMEs Digital Financial Transformation research. Four key conclusions are presented in this study after reviewing 362 scientific papers. The main theme turns out to be the significance of digital financing for SMEs, which is followed by themes pertaining to digital transformation. Second, the most often utilized data sets are exploratory and case studies. Third, approximately the same number of studies have been conducted on the digital financial transformation of SMEs in developed and developing nations. Fourth, other study goals were suggested based on bibliometric methods with VOSviewer, which were divided into four groups and tested these themes to elaborate on theoretical and methodological elements. The future development of SMEs' digital financial transformation will be furthered by investigating this issue.

Keywords: Digital Transformation, Digital Financial, SMEs, VOSviewer, bibliometric analysis

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INTRODUCTION

Using some technology is necessary for business development. To succeed and be flexible in the age of the digital economy, SMEs must undergo digital transformation. Growth of SMEs in developed and emerging nations can be greatly accelerated by digital transformation (Saridakis et al., 2018). However, due to the complexity of technology adoption, SMEs in developing countries have faced numerous difficulties that have not been fully handled (Kurnia et al., 2015). Positive results from earlier study regarding the significance of digital transformation in company have been reported (Arianto, 2020; Budiarto et al., 2021; Marini et al., 2020; Tolstoy et al., 2021). For both customers and the economy, digital finance can also encourage greater financial intermediation and economic stability. Performance can be improved in the long run by using innovations in digital finance (Dahnil et al., 2014).

People's behavior has changed as a result of technological advancements, and this includes how they purchase goods and services, both of which may now be done online to enhance customer service, effectiveness, speed, and security. This aids in the growth of SMEs that offer information and transactions relevant to business (Agyekum et al., 2021). For both customers and the economy, digital finance can encourage greater financial intermediation and economic stability. Performance can be improved in the long run by using innovations in digital finance (Kartini, Pahlevi & Rachmi, 2022). SMEs can implement a variety of strategies to enhance business performance and convert digital finance by implementing current business model innovations. SMEs can implement a variety of strategies to enhance business performance and convert digital finance by implementing current business model innovations (Nurfauzan & Faizatunnisa, 2021). Digital finance, according to the practitioner's point of view, is the delivery of financial services via mobile devices, desktop computers, the internet, or cards that are integrated with digital payments in a dependable system. Greater control over personal funds, quick financial decisions, and the capacity to send and receive payments in a matter of seconds all contribute to corporate efficiency, which in turn affects performance.

With regard to keywords, research sites and topics, as well as the research methodologies, this study intends to carefully assess international scientific articles for SMEs Digital Financial Transformation research. Future digital work entails a change in the tools utilized for work tasks, and frequently modifies the operational activities and processes themselves (Ivaninskiy & Ivashkovskaya, 2022). The need for autonomy, competence, and relatedness, which have an impact on the employees' motivation to accept the future workplace, are crucial psychological demands for employees in this environment (Shao, 2022). Employees will be more motivated to support digital transformation if they anticipate that the digital environment will allow them to efficiently achieve improved performance, more satisfaction, and personal well-being.

This study sheds light on how SMEs digital financial transformation research has been distributed over a number of nations, years, themes, approaches, and links between

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developed themes. According to the data that researchers have gathered, there has been an increase in study on SMEs' digital financial transformation from 1995 to 2022. In 1995, there was just one study. There were few studies between 1996 and 2016—less than 20 studies annually. However, it started to rise in 2017 and peaked in 2021 with 115 studies. It is estimated that numerous research that were anticipated to be released in 2023 have not yet been published in 2021 or 2022.

![Graph showing the number of articles about SMEs digital financial transformation](image)

**Figure 1** Shows The Number Of Articles About SMEs Digital Financial Transformation.

(Authors' further explanation based on the Scopus Database)

According to the summary above, this study helps to address open-ended research topics. What are the primary themes, research methodology, and study contexts (geographies and industries) in studies on digital financial transformation in SMEs? Each section is explained below to help with the response to this query. Consequently, the following are the research questions relevant to our area of study:

RQ1. What role does bibliometrics play in SMEs' digital financial transformation?
RQ2. What is the researchers' primary argument in this research flow?
RQ3. What are the theoretical and practical research embodiments for upcoming research views on SMEs' digital financial transformation?

This study is part of a quantitative descriptive study that uses bibliometric analysis and data from the Scopus database to explain the evolution of research papers on the subject of digital financial transformation in SMEs. Publication of findings from scientific studies on the subject based on 362 documents overall from 1995 to 2022 that were included in the Scopus database. Since Scopus draws its data from publishers all over the world, it enjoys a well-deserved reputation as being the largest database available today.
Abstracts and citations from peer-reviewed journal articles and other literature from other websites are available in the Scopus database.

**LITERATURE REVIEW AND HYPOTHESIS**

In light of the fact that digital transformation is a powerful force behind several socioeconomic developments and a key driver of growth, productivity, competitiveness, and innovation for businesses in the current economic environment, it is vital to concentrate on individual digital capabilities (L. Zhang & Li, 2022). Explicitly defining how a person's digital capabilities affect an organization's performance and expansion requires more work. The global economic landscape is being reshaped by digital markets, which are fundamentally altering how businesses function. Adopting new digital technology opens up new business options and offers benefits to management and organizations (Fan & Chen, 2022). In this case, personal digital skills serve as the catalyst for embracing new technologies as a hub for quick acclimatization to the digital revolution (Lin & Ma, 2022). Individual digital capabilities are more important in the SMEs business environment than in large corporations since a higher percentage of workers in small corporations than in large corporations are involved in implementing business performance in SMEs (Li et al., 2022).

Information, communication, problem-solving, and software categories can be used to separate out an individual's capabilities. The issues of digital transformation and sustainability are becoming more important for both enterprises and society. The market environment is changing due to digital technology, presenting new opportunities and difficulties for these businesses (Kabanda & Brown, 2017). Increased productivity, better decision-making processes, greater flexibility, shorter time to market, business model innovation, new roles for enterprises and customers, and environmental sustainability are just a few of the possible effects of digitalization for businesses and society (Ulas, 2019).

People's behavior has changed as a result of technological advancements, and this includes how they purchase goods and services, both of which can be done online to enhance customer service, effectiveness, speed, and security (J. A. Zhang et al., 2020). This expansion of enterprises promotes and offers information for commercial transactions. Excellent economic stability and more financial intermediation for consumers and the economy can both be fostered through digital finance. Digital financial advancements may enhance performance over the long run (Munir et al., 2011). By updating their business models, companies can employ a variety of policies to enhance their overall performance and alter the digitization of finance. Digital finance, from the perspective of a practitioner, is a financial service provided via cellular devices, personal computers, the internet, or government-affiliated cards. Greater control over personal finances, quick financial decisions, and the capacity to send and receive payments in seconds to improve business efficiency and performance are all advantages of digital banking (Ireland & Webb, 2009).

Understanding individual digital finance is important since it is a key driver of growth, productivity, competitiveness, and innovation for businesses in the current...
economic environment. Digital financial transformation is a dynamic force behind many socio-economic transformations (Kohtamäki et al., 2020). While the study of individual-level qualities, skills, and human capital has drawn interest in the literature on strategy. The impact of people's digital financial capabilities on organizational performance and growth needs to be clarified more (Lee et al., 2016).

**RESEARCH METHOD**

The statistical analysis of books, papers, and other publications is a specialty of bibliometric studies. The transparent quantitative and qualitative analyses of certain information streams are supported by more thorough bibliometric research, nevertheless (Pahlevi, 2022). We employed a meta-literature book, which is frequently used in current literature and combines bibliometric (quantitative) and content (qualitative) methodologies, to conduct this research. The goal of the bibliometric technique was initially to recognize and comprehend networks based on citations (Kartini, Pahlevi & Rachmi, 2022).

Science is a dynamic field that is always changing and evolving. The bibliometric approach can be used to determine this. A landscape analysis is conducted using bibliometrics to depict a notion. Collaborative author data, networks between keywords, citations between papers, and other information are used as input for the search analysis findings (Pahlevi & Nurcahyo, 2022). The outcomes of this crisis analysis then provide researchers with knowledge on creating a concept that might aid in organizing and defining research ideas. The VOSviewer is one program that supports the bibliometric method. A tool for conceptual development through visualization is called VOSviewer.

On the basis of this, the authors are motivated to conduct a study on SMEs digital financial transformation in order to 1) gain an overview of the development of scientific publications on SMEs digital financial transformation present in the Scopus database from 1995 to 2022; and 2) identify the key issues that have emerged in this field. Number of publications on SMEs digital financial transformation broken down by document type, affiliation/institution, and country; 2) Sources of scientific publications on SMEs digital financial transformation; 3) Productivity and collaboration of researchers on the subject; 4) 5) Keyword clustering-based visualization of the publication network of SMEs' digital financial transformation.

According to the Scopus database, 362 documents in total were stored there between 1995 and 2022. Since Scopus draws its data from publishers all over the world, it enjoys a well-deserved reputation as being the largest database available today. Abstracts and citations from peer-reviewed journal articles and other literature from other websites are available in the Scopus database.

**RESULT AND DISCUSSION**

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The distribution of articles and important facets of SMEs' digital financial transformation will be the main topics of this section. The distribution of articles is determined by the number of articles published by journal sources annually and by annual publications. The most fruitful parts of influential SMEs' digital financial transformation will be on show, including those related to the author, affiliation, country, and subject of study.

4.1 Analysis of Bibliometric Descriptive
In order to address two research questions on the study setting (topic, subject, and place of research implementation), research technique, and research theme clusters, the 362 articles that were chosen for discussion are divided into two sections. Discussing the top sources for research on the digital financial transformation of SMEs by top Affiliates would be useful.

![Figure 2. Article count by affiliation (top ten institutions)](Authors' further explanation based on the Scopus Database)

There is international research on the digital financial transformation of SMEs. The graph demonstrates the fact that both developed and developing nations are conducting research on the digital financial transformation of SMEs. The United States, Russia, Australia, Spain, India, Turkey, Italy, and Germany are examples of developed nations. If, in the context of technological development, the application of digital financial transformation in SMEs has a significant or high value. In the context of digital finance and specific strategies for fostering digital financial inclusion for SMEs, the idea of digital financial transformation for SMEs is explained. New forms of collaboration and
communication are needed in business organizations as a result of digitalization. It can be interpreted as the replacement or alteration of business processes through the use of digital technology and data (digital and native digital). The integration of digital technology across all organizational functions and processes is what is meant by "digital transformation," and this process ultimately changes how an organization runs and provides value to its customers..

**Figure 3.** Article count by nation or territory (top ten)
(Authors' further explanation based on the Scopus Database)

The most prolific authors are depicted in Figure 4. The following section will talk about the authors' influence. We'd like to introduce the author first. Next, the name of the author who has produced the most work according to the criteria for documents having at least 10 citations is listed.
4.2 Mapping and Visualization of Bibliometric Data

The network, overlay, and density visualization features in VOSviewer can be used to illustrate the author visualization of publications for SMEs on digital financial transformation. (Refer to Figure 5) Only cluster 1 has a network, and Bataev A.V. has the strongest network of any author. Network visualization: Describes the network between writers. The historical traces of each author's study are illustrated using an overlay visualization; Diep V.T. was the most recent author in 2017. Finding study areas that are infrequently conducted using density visualization.

The authors also conduct a keyword usage study for the years 2017 through 2022. Since no keywords appeared together in two or more publications in previous years, this analysis is only possible as of 2017. Additionally, the analysis did not take into account the terms that were first used in studies. The writers create a network diagram utilizing phrases that frequently emerge from the keywords used in the examined articles in order to enhance the investigation. At least two instances of the term are used simultaneously.

Using cluster analysis, four clusters were identified.

4.2.1 Research themes related to the digital financial transition in SMEs

Researchers visualize the possibility for clusters in each keyword from the reviewed articles using the VOSviewer software. First, the researcher divided each issue on the diagram into four major clusters based on color differences (red, purple, green, and yellow). The contrasting colors represent the many linkages and analytical subjects. The node then determines how frequently the topic is used (digital financial transformation in SMEs).
Figure 5. Visualization of a network
(Software VOSviewer as a source)

This study divides the 362 articles it looked at into the red, purple, green, and yellow groups. Digital financial transformation including innovation, financial inclusion, financial technology, financial services, business models, and risk assessment is the interconnected red cluster theme. Digital financial transformation with big data, decision-making, the internet of things, economic and social effects, metadata, and information management make up the green cluster of interconnected issues. Industrial finance, competition, e-commerce, and digital financial transformation with the utilization of information make up the purple cluster of interconnected themes. Digital financial transformation with digitization, business continuity, and economic development make up the yellow cluster of connected subjects.
4.2.2 Author Co-Authorship Analysis
The co-authorship analysis is broken down into writers and institutions based on the VOSviewer program. The results of the most productive writers, contributions, and nations, as shown in the preceding table, are likewise shown by the co-author analysis. However, the sole focus of this study is on author analysis co-authorship. 362 authors are listed in the findings, however VOSviewer claims that the majority of them are not yet connected. According to Figure 6, just six writers have the greatest related item set. The relationship between the six authors is depicted in Figure 6.

![Figure 6. Author Co-Authorship Analysis](Software VOSviewer as a source)

4.2.3 Study of cross-national co-occurrence
The contribution of each nation to the scientific field is displayed on the map of countries' co-occurrences. To make the image transparent, this article examined the search results from the Scopus database. Figure 7 displays the nation co-occurrence map (Scopus database) after modifying the node size, label font size, and node location. The size of each node in Figure 7 indicates how much material is available for that nation. The radius of the node for a country increases with the amount of literature produced there. The outer circle of the node's color indicates how much literature has influenced that nation. Stronger significance is indicated by a line in the outer circle that is thicker. The gradient hue within the node indicates the publication date of the literature in that nation, with warm colors denoting more recent publications and cool colors denoting older ones. When two countries are mentioned in an article at the same time, it is represented by a line between the nodes, with stronger lines denoting greater cooperation. The most well-known and significant nation is China, which is followed by Russia and the United Kingdom.
4.3 Prospective Research Directions

People's behavior has changed as a result of technological advancements, and this includes how they purchase goods and services, both of which may be done online to enhance service, effectiveness, speed, and from a security perspective, providing convenience for clients (Todericiu & Stăniţ, 2015). This aids in the growth of SMEs that offer information and transactions relevant to business (Resmi et al., 2021). Financial intermediation for customers and the economy as a whole can increase thanks to digital finance (Zhao et al., 2020). Performance can be enhanced over the long term by using digital financial innovation. SMEs can implement a variety of policies to enhance business performance and transform digital finance by modernizing business models (Amaral & Peças, 2021). Digital finance, according to the practitioner's point of view, is the delivery of financial services via mobile devices, desktop computers, the internet, or cards that are integrated with digital payments in a dependable system. Greater control over personal funds, quick financial decisions, and the capacity to send and receive payments in a matter of seconds all contribute to corporate efficiency, which in turn affects performance (Ardito et al., 2021).

The three key avenues for business growth are digitalization, internationalization, and sustainability. Current economic pressures, in particular, on the importance of digital transformation as the primary driver of corporate growth, especially for SMEs (Kartini, Pahlevi & Rachmi, 2022). SMEs are currently urged to pursue sophisticated company growth strategies in order to strengthen their competitive edge by keeping up with the
ever-quicker pace of technological advancement. For SMEs firms, digital transformation and competitive advantage are issues. The market environment is evolving as a result of digital technology, creating new opportunities and difficulties for SMEs (Scuotto et al., 2021). Not only in poor countries but also in industrialized countries, SMEs play a critical role in development and economic progress (Garri & Konstantopoulos, 2013).

The adoption of digital transformation has enormous potential to promote the expansion of SMEs in both developed and developing nations (Liu et al., 2018). However, due to the complexity of technology adoption and the necessity for specific standards on corporate governance in the SMEs sector, SMEs in developing countries have encountered numerous issues that have not been fully handled. An opinion that there is no need for specific arrangements because agency difficulties do not exist in SMEs is mentioned in the discussion of various research (Niemand et al., 2021).

Positive results from earlier study regarding the significance of digital transformation in company have been reported (Lin & Ma, 2022; Pahlevi & Rachmi, 2022; Sahaym et al., 2021). For both customers and the economy, digital finance can also encourage greater financial intermediation and economic stability. Performance can be enhanced over the long term by using digital financial innovation. However, despite the fact that internationalization is one of the three key routes for corporate growth, we were unable to locate any research that links it to the digital financial transformation of SMEs.

CONCLUSION

Four key conclusions are presented in this study after reviewing 362 scientific papers. The main theme turns out to be the significance of digital financing for SMEs, which is followed by themes pertaining to digital transformation. Second, the most often utilized data sets are exploratory and case studies. Third, there are almost as many studies on SME Digital Financial Transformation in developed and developing nations. Fourth, other study goals were suggested based on bibliometric methods with VOSviewer, which were divided into four groups and tested these themes to elaborate on theoretical and methodological elements. The future development of SMEs' digital financial transformation will be furthered by investigating this issue.

Utilizing bibliometric analysis methods, all Scopus publications pertaining to the digital financial transformation were examined. The study structure, key ideas, and
correlations are established as well as a quantitative description of quantitative communication. Through theoretical and practical contributions to knowledge, this attempt aids in the creation of a rigorous examination of diverse scientific issues. The ability of SMEs entrepreneurs to adapt and innovate will impact their financial success. Entrepreneurs must utilize digital-based financing in order to transact business online across municipal, province, and national boundaries. Thus, in order to optimize the possibility of generating revenue, financial knowledge is necessary. Online, there will be simple access to adequate digital financial literacy, comprehension, and active usage of financial technology solutions.

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