

## Technology Innovation of Small and Medium Enterprises: A Literature Review Assisted with NVivo 12 Pro

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### Abstract

*This research aimed to explore the technological innovation trends among SMEs in various countries. Data was obtained by searching literature from metadata on the Scopus website from 2020 to 2023. The literature obtained was then selected using the Prisma method based on the researcher's needs, and analyzed qualitatively and mapped with the help of NVivo 12 Pro. The study's results, based on the country of research location, obtained results of innovation in the technology field for SMEs from Indonesia. The best journals with publications quite popular for researchers in the SMEs field are the Journal of Business Research (Q1) and Cogent Business & Management (Q2). Innovation in marketing or advertising is the most dominant, and research will occur in 2022 and 2023. Trends in the use of technology in MSMEs from the results of the literature review include financial systems, exports, transactions, quality management, supply chain management, financial technology, marketing, and production. The literature review results that still need to occur more regarding technological innovation for SMEs are technological innovation at the management or organizational scale.*

**Keywords:** SMEs, the technological innovation; NVivo 12 Pro

### Abstrak

Penelitian ini bertujuan untuk mengeksplorasi tren inovasi teknologi di kalangan UKM di berbagai negara. Data diperoleh dengan menelusuri literatur dari metadata di website Scopus pada tahun 2020 hingga 2023. Literatur yang diperoleh kemudian diseleksi menggunakan metode Prisma berdasarkan kebutuhan peneliti, dan dianalisis secara kualitatif dan dipetakan dengan bantuan NVivo 12 Pro. Hasil penelitian berdasarkan negara lokasi penelitian diperoleh hasil inovasi bidang teknologi bagi UMKM asal Indonesia. Jurnal terbaik dengan publikasi yang cukup diminati para peneliti di bidang UMKM adalah Journal of Business Research (Q1) dan Cogent Business & Management (Q2). Inovasi di bidang pemasaran atau periklanan paling dominan dan penelitian akan terjadi pada tahun 2022 dan 2023. Tren pemanfaatan teknologi pada UMKM dari hasil telaah literatur meliputi sistem keuangan, ekspor, transaksi, manajemen mutu, pengelolaan rantai pasokan, teknologi keuangan, pemasaran, produksi. Hasil tinjauan literatur yang masih perlu dilakukan lebih lanjut mengenai inovasi teknologi untuk UMKM adalah inovasi teknologi pada skala manajemen atau organisasi.

**Kata kunci:** Inovasi teknologi, NVivo 12 Pro, UMKM

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## INTRODUCTION

The micro, small and medium enterprises (SMEs) as local industry has been supporting the economy and is recognized by various studies in various countries (Verma, Shome, and Hassan, 2023). SMEs support a country's economy because they play an essential role, especially in the world's economies of developing and developed countries (Prakash, Kumar, and Verma 2021). As companies function, SMEs have been the backbone and are recognized for their significance for the potential for economic growth and development of a nation. SMEs are characterized by several characteristics, namely low investment, higher employment opportunities, non-rigid operations, and no gaps (Wulandari and Koe, 2023). SMEs have contributed to prosperity among the middle class, minimized economic disparities between regions or regions, encouraged local entrepreneurship, and improved the living standards of non-urban areas (Trunina, Liu, and Chen, 2019). SMEs also provide enormous complementary work for large organizations, act as providers of raw materials, and provide competitive economic stimulus (Mutamimah, Alifah, and Adnjani, 2023).

Innovation is the production or adoption, assimilation and exploitation of novelty with added value in the economic and social fields; product, service and market updates and expansion; development of new production methods; and establishment of a new management system (Yuana et al., 2021). Innovation is related to a process and result. Innovation is part of the detailed operation of entrepreneurship, whether in a current business, a public service institution, or a new venture started by a single individual, starting from a home kitchen (Trunina et al., 2019). Innovation is a means by which entrepreneurs create new resources or enrich existing resources and improve them to make new things to increase income from the business (Cueto et al., 2022). Innovation can also be represented as a decision process in implementing innovation as a series of steps, including initial knowledge, forming an attitude, the judgment to embrace or leave, undertaking and use, and confirmation of the decision (Miniesy, Shahin, and Fakhreldin, 2021).

For SMEs, innovation is inevitable. Innovation goals in SMEs vary significantly between product, process and service improvements, especially those related to new product development (Purwaningsih, Muslikh, and Suhaeri, 2022). The new understanding of innovation encourages SMEs to have an essential function in combining innovative practices or in the form of diffusion of new technologies, thereby increasing the potential for ample employment opportunities (Miniesy et al., 2021). SMEs implementing innovation in the technology sector have occurred in various industries, such as factory production activities or just the machines used. The adoption of technology as an innovation has been chosen by many companies, such as in the automotive, food, clothing, electricity, or tool sectors. For SMEs, innovation can be a catalyst for growth as part of business and the economy (Yaskun et al., 2023). Furthermore, SMEs must continuously increase innovation, such as revolutionizing the economic structure from within, namely innovating with better or more effective processes and products or in the form of innovation in advertising and marketing.

There has been a giant leap in technology adoption at various levels of society, including the industrial world, primarily when the COVID-19 pandemic occurred (e.g., Dini Yuliana, and Adityawati, 2023). Many SMEs were forced to close; however, several SMEs increased drastically. One of the extreme improvements during the pandemic is following the development of digital technology, such as in buying and selling transactions carried out online (e.g., Sari et al., 2023). Technology adoption that is also very rapid is the payment process, which has shifted to financial technology using electronic money. These examples are an essential part of the innovation that

SMEs must be able to adopt, either immediately or gradually. Technology innovation must become part of exploitation by an SMEs entrepreneur to achieve superior performance, but ironically, invention for SMEs in developing countries still needs to be understood (Widayani, Fiernaningsih, and Herijanto, 2022). This research explores the technological innovation trends among SMEs in various countries, especially during the pandemic in 2020.

## METHOD

This research explores studies on micro, small and medium enterprises (SMEs) in terms of innovation in the technology field. Data was obtained by searching literature from metadata on the Scopus website from 2020 to 2023. 2020 was chosen as the initial condition for the COVID-19 pandemic, which was the reason for technological leaps in various fields and no exception for micro authorities. The literature obtained was then selected using the Prisma method based on the researcher's needs to answer the problem formulation (Hartanto, Suparyanto, and Azwar, 2023). Next, the selection results were analyzed qualitatively and mapped with the help of NVivo 12 Pro. NVivo 12 Pro software was chosen to see how connected the literature reviewed is by grouping MSMEs based on the type of innovation.

### 1. Data collecting

The screenshot shows the Scopus search interface with the following search criteria:

- Search within: Article title, Abstract, Keywords
- Search documents: "Small And Medium Sized Enterprises"
- Search documents: Innovation
- Search documents: digital

55 documents found

Document title	Authors	Source	Year	Citations
1 Article - Open access SMEs and open innovation: Challenges and costs of engagement	Costa, A., Crupi, A., De Marco, C.E., Di Minin, A.	Technological Forecasting and Social Change, 194, 122731	2023	1
2 Article - Open access Role of Digital Transformation for Achieving Sustainability: Mediated Role of Stakeholders, Key Capabilities, and Technology	Martínez-Peláez, R., Ochoa-Brust, A., Rivera, S., ... Félix, R.A., Mena, L.J.	Sustainability (Switzerland), 15(4), 11221	2023	3
3 Article - Open access E-Commerce Technologies Adoption Strategy Selection in...	Bening, S.A., Dachyar, M.	Sustainability	2023	1

**Figure 1. Scopus website screen page on literature search**

Research data was obtained through a search on the official Scopus website at the link <https://www.scopus.com/search/form.uri?display=basic#basic>. The search begins with the keywords small and medium-size enterprise, innovation, and technology. The search results were continued by determining the year range from 2020 to 2023. 2020 was chosen as the start of the pandemic as the biggest difficulty

for small and medium businesses. The search was continued by selecting keywords available from the website page under the keyword "Innovation" until a total of 55 filtered metadata was obtained. The results of this search are shown in Figure 1.

## 2. Data selection

The next stage in this research method is literature selection using the Prisma method (Figure 2). In this study, the Prisma method includes the Identification, Screening, and Included stages (Hartanto et al., 2023). The Identification stage is a selection of metadata results from the Scopus website of 55 titles, then analyzed based on the titles and abstracts obtained. The results of this first stage analysis revealed that 18 articles did not match the studies in this research. The next stage is Screening, which is the selection stage of the entire article content as literature or data in this research. Based on the content and checking indexation of journals, it is known that as many as eight pieces of literature come from journals that are not indexed or declared discontinuous by Scopus. Twenty-nine articles were continued to the next stage, namely Included. The Included stage is a determination for literature to enter the review process in answering the formulation of this research problem. At this final stage, the literature is grouped based on the type of innovation that is the research focus from the literature used as research data. Grouping includes Accounting, Exporting, Finance Technology, Managing the supply chain, Marketing, Production, Transaction, and Quality management.

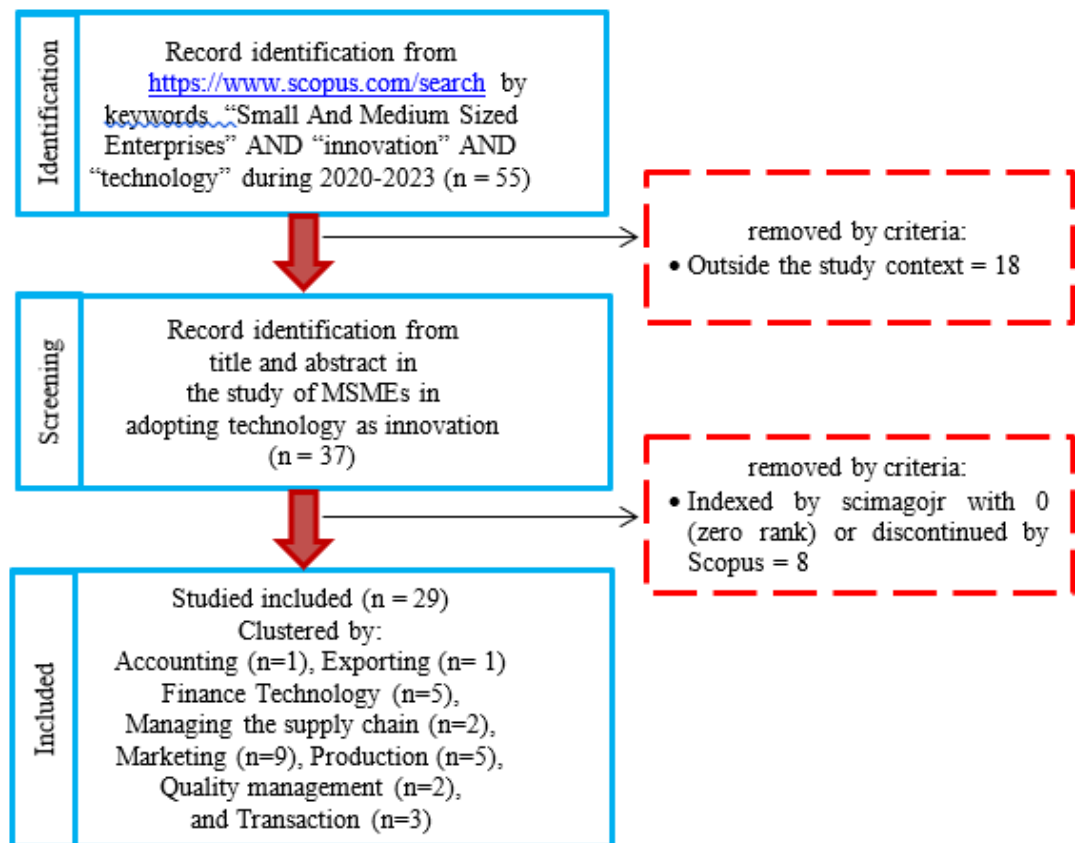
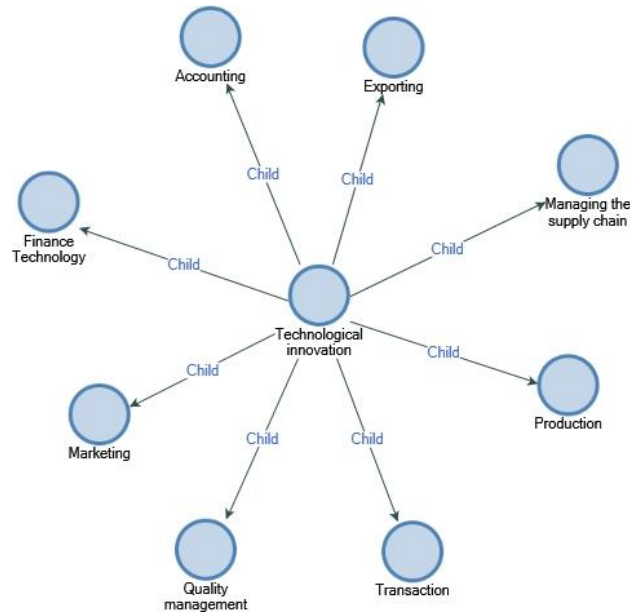


Figure 2. Prisma Flowchart during selecting the literature

## 3. Data analysis

The final part of this method is research data analysis. A total of 29 articles were analyzed and mapped with the help of NVivo 12 Pro. NVivo was chosen as a tool to help present the study results because it can accurately attach each piece of

literature to each group, including the criteria the researcher set in the literature label (Rawindaran et al., 2023). Each group in NVivo is a child node, namely eight groups that researchers determined from the type of innovation in SMEs (as parent nodes) (Figure 3). Each child node is then connected to each piece of literature. Each piece of literature is labeled with a year code, country of research location, and serial number of the literature label. Year codes include 2020, 2021, and 2022; serial number codes include numbers 1 to 37.



**Figure 3. Grouping technological innovations in MSMEs**

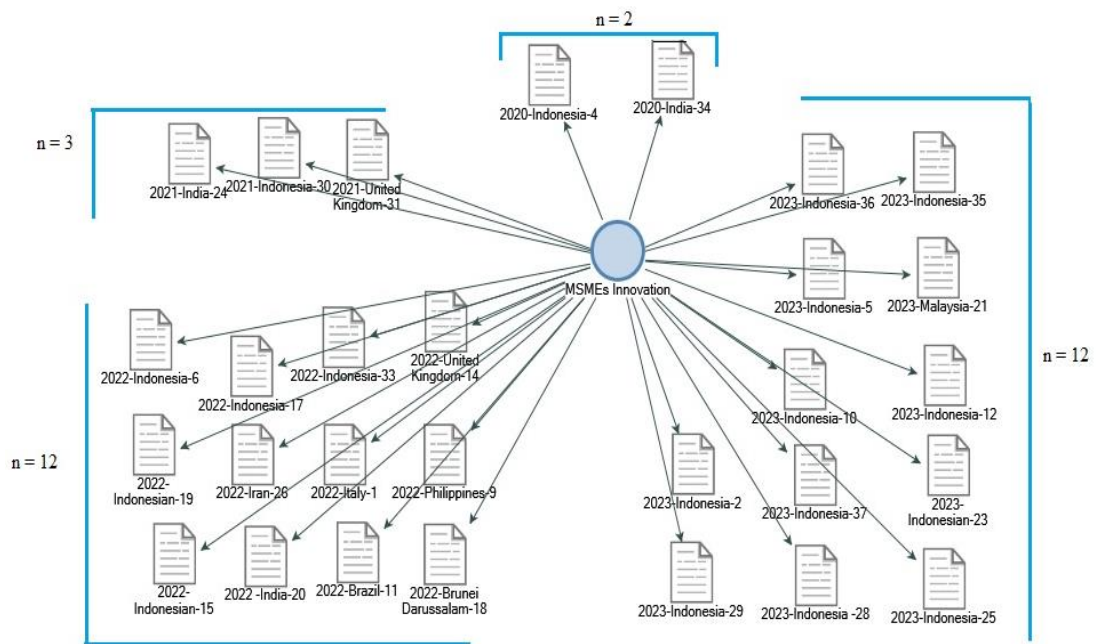
## RESULT AND DISCUSSION

Twenty-nine literature items have been studied in depth to discover research trends related to digital innovation in micro and medium enterprises. This research also examines the characteristics of the research data obtained, including the name of the journal that publishes it and the indexation of the journal. This analysis showed that the articles selected as data in this study were articles published by trusted and qualified journals based on Scopus and Scimagorj indexation.

### 1. Literature characteristics by year, country, and publishing journal.

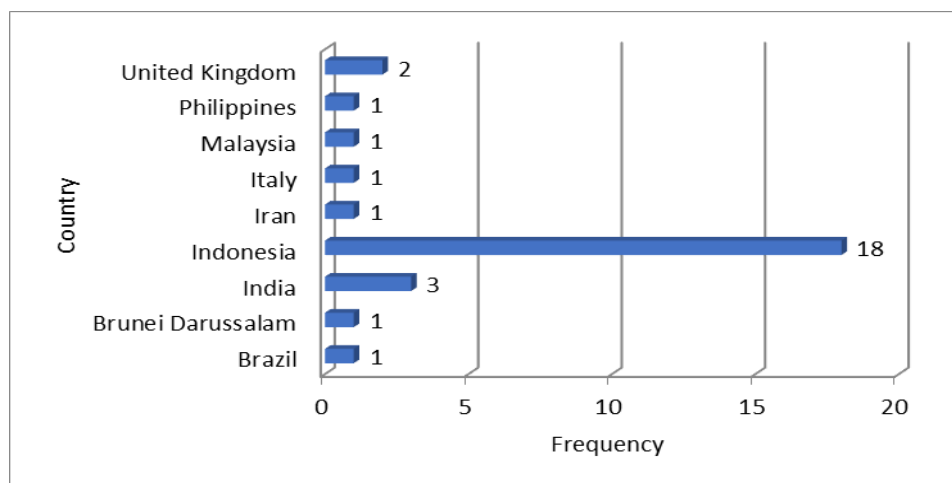
Based on the year the article was published, it is known that the frequency of articles has increased from 2020 to 2023. In 2020, two studies specifically examined innovation for micro and medium entrepreneurs. Significant numbers were obtained in 2022 and 2023 with 12 articles each (Figure 4). These findings show that innovation in small and medium businesses has experienced a high spike since the pandemic. As stated in several studies, technology was an obstacle for small entrepreneurs before the pandemic. However, currently, the opposite is happening; home entrepreneurs have massively chosen digital media to run their businesses





**Figure 4. SMEs technological innovation from various countries**

The study's results, based on the country of research location, obtained results of innovation in the technology field for small and medium entrepreneurs from Indonesia in a total of 18 studies (e.g., Sari et al., 2023). Likewise, developing countries, such as India, Malaysia, or Brazil, dominate other research. However, studies have also been obtained from developed countries like the United Kingdom (Gkypali, Love, and Roper, 2021). The large amount of literature originating from Indonesia shows that SMEs are the main support of the economy, and the number of SMEs continues to increase from time to time (Latifah et al., 2020; Purnomo, Purwandari, and Sentosa, 2022; Wulandari and Koe, 2023; Yuana et al., 2021).



**Figure 5. Frequency of research publications on SMEs technological innovation from various countries**

The next characteristic is based on the name and indexation of the journal that published articles from the literature in this research. A total of 29 articles came from journals with Q1 to Q4 indexation, with a balanced number. The best journals with publications quite popular for researchers in the SMEs field are the Journal of Business Research (Q1) and Cogent Business & Management (Q2), with three

articles each (Table 1). These findings show that studies of small and medium enterprises also attract attention from indexed journals or are considered highly credible internationally, especially in studies of technological innovation.

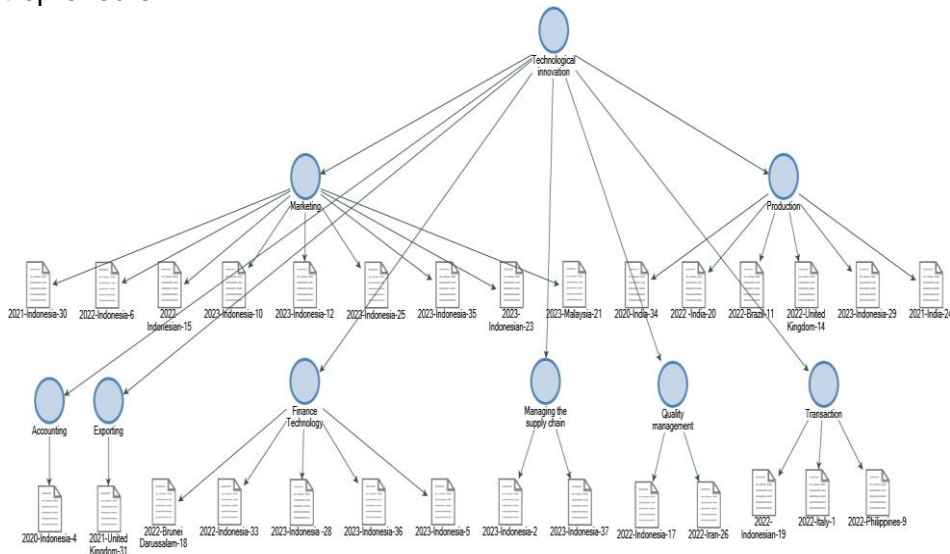
**Tabel 1. Journal name and the indexing that publishes research on SMEs technological innovation from various countries**

No	Journal Name	Indexing	Frequency
1	Administrative sciences	Q2	1
2	Brazilian business review	Q3	1
3	British food journal	Q1	1
4	Cogent Business & Management	Q2	3
5	International journal of professional business review	Q4	3
6	Journal of Business Research	Q1	3
7	Journal of Distribution Science	Q4	2
8	journal of eastern european and central asian research	Q3	1
9	journal of evolutionary studies in business	Q3	1
10	Journal of Indian Business Research	Q2	1
11	Journal of Islamic Accounting and Business Research	Q3	1
12	Journal of Small Business and Enterprise Development	Q1	1
13	journal of strategic marketing Problems and Perspectives in Management	Q1	1
14	Problems and Perspectives in Management	Q2	2
15	Management	Q2	
16	Proceedings on Engineering Sciences	Q4	1
17	Quality access to success	Q4	1
18	Serbian Journal of Management	Q3	1
19	Uncertain Supply Chain Management	Q3	3
20	World Review of Entrepreneurship, Management and Sust. Development	Q3	1

## 2. Technological innovation in small and medium enterprises (SMEs) in various countries over the last four years

Innovation in marketing or advertising is the most dominant, and research will occur in 2022 and 2023. In this section, research is dominated by Indonesia (Figure 6). This phenomenon is in line with current conditions, where social media is the main target for home businesses' advertising and marketing process (Winarso et al., 2023). Moreover, increasingly, e-commerce is developing to provide online stores for small entrepreneurs so that they no longer need buildings or high costs to make sales (Dini Yuliana, and Adityawati, 2023). Digital marketing is also encouraged by many influencers as brand ambassadors for a product through various digital content to attract consumers. The next finding is innovation in production with literature sources from developing countries such as Malaysia, India, or Brazil. Innovation in the production process is in the form of using machines or production processes with the help of technology (Costa and Alam, 2022). Technological innovation in the production process for small and medium

entrepreneurs has become a topic of study even during the ongoing pandemic. Micro entrepreneurs who are starting to do this include manufacturing and clothing entrepreneurs.



**Figure 6. Grouping MSMEs technological innovation from various countries**

Technological innovation that is also a focus for SMEs is the payment process, which is starting to transform into digital form. Payments in digital form are known as fintech or electronic money. Electronic payments have become commonplace nowadays; this started when social distancing was implemented during the pandemic and continues today (Widayani et al., 2022). The ease of transactions in digital form is becoming a rapid innovation in the field of buying and selling, so it can be concluded that the application of digital finance is a necessity for entrepreneurs, even on a small and medium scale, as an effort to adapt to the era of technology that continues to develop. The literature review results that still need to occur more regarding technological innovation for SMEs are technological innovation at the management or organizational scale. Technological innovation is also needed for small business management on an organizational scale. In an organizational context, innovation can be associated with positive efficiency, productivity, quality, competitiveness, and market share changes (Kristamuljana, 2016). Organizations for small and medium entrepreneurs need innovative strategic leaders who have in-depth knowledge and expertise regarding the development of new products and markets in each geographic region.

## CONCLUSION

Twenty-nine literature items have been studied in depth to discover research trends related to digital innovation in micro and medium enterprises. The study's results, based on the country of research location, obtained results of innovation in the technology field for small and medium entrepreneurs from Indonesia in a total of 18 studies. The best journals with publications quite popular for researchers in the SMEs field are the Journal of Business Research (Q1) and Cogent Business & Management (Q2). Innovation in marketing or advertising is the most dominant, and research will occur in 2022 and 2023. The next finding is innovation in production with literature sources from developing countries. Technological innovation that is also a focus for SMEs is the payment process, which is starting to transform into digital form. The literature review results that still need to occur more regarding technological innovation for SMEs are technological innovation at the management or organizational scale.



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