



(RESEARCH ARTICLE)



## Assessment of COVID-19 impact on the digitization of Small and Medium Enterprises (SMEs) in India

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International Journal of Science and Research Archive, 2024, 11(01), 077–089

Publication history: Received on 23 November 2023; revised on 02 January 2024; accepted on 05 January 2024

Article DOI: <https://doi.org/10.30574/ijrsra.2024.11.1.1120>

### Abstract

This paper sets out to construct a digitization system for sustainability in small and medium-sized enterprises (SMEs). SMEs are the most exposed to the adverse consequences of Covid-19. When people exercise social distancing, they decrease their activity levels outside their homes, resulting in low volume in sales. Because of this, SMEs must shift their mindset by using technological transformation. Compared to offline enterprises, digital SMEs may diversify consumer groups quickly by increasing revenue, providing access to a more extensive client base, increasing operational efficiency, and improving customer experience. SMEs can be expected to maintain their sustainability as a result. But for some SMEs, it is not easy to comprehend the specific digital competencies relevant to their business. However, during the study, it was discovered that online businesses could result in long-term sustainability for their firm, both present and future.

**Keywords:** Digitization; Sustainability; SMEs; Covid-19

### 1. Introduction

Covid-19 pandemic occurrences worldwide significantly impact health and the overall economy because of their impact on trade, tourism, and investment [1, 2]. In India, implementing social distancing impacts businesses, including SMEs [3]. For the better part of a decade, it has been believed that SMEs can move a country's economy. Compared to other businesses, SMEs are more vulnerable due to the covid-19 pandemic. Firms like these are highly dependent on the momentum of revenue that flows in from merchandise sales, and when this flow decreases, it impacts the company's cash flow [4].

As a result of government regulation, socio-physical distancing limits are imposed on movement and consumption. Hence it inhibits market transactions. The impact on the various elements has been widespread, with restaurants, shopping centres, markets, online shopping, and SMEs all feeling the effects [5]. As a result, people have altered their shopping patterns and have obtained their basic needs using the internet. A few SMEs are concerned about the government's policy that calls for everyone to work or remain at home (WFH). This policy could lead to a decline in productivity. It is, in fact, possible to use the WFH system effectively [6].

Traditional retail locations, including supermarkets, restaurants, car dealerships, cinemas, and health wellness centres, suffer heavy losses because of their dependence on physical locations. Online markets are in contrast with brick-and-mortar retailers. The application of technology is an excellent way to ensure SMEs' Sustainability in situations like covid-19 [2]. Some small-sized businesses don't know about digital skills useful in the business world, so this factor drives

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them to online learning. The recent pandemic strain called covid-19 presents a perfect opportunity for SMEs to upgrade their role and develop various methods to establish goods and services based on their business's particular issues. SMEs should not have a problem increasing sales due to Covid-19 because they can use digital marketing to promote their businesses [7].

For small-medium businesses, digital transformation can help them compete more effectively. The way they do business is changing from a storefront-based company to an online-based business for security and ease of use in the face of a pandemic; SME businesses can help with the distribution process by using online applications such as emails and mobile websites. SMEs are actors of the digital economy, so the skills transformation and innovation required for business sustainability are needed now and in the future.

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## 2. Digitization in SMEs

Digital transformation generally represents a drastic and complete transformation in using technologies to increase the firm's performance. In business, the digital transformation is the name given to the complex process by which organizations undergo a significant shift characterized by digital technology. Digital transformation differs from the notion that it involves using technology to improve its performance or reach. Another definition of digitization is "Transformation into a digital organization is the third and most advanced level of digital capability" [8]. As a result of this, when people use digital technology, they are also more innovative, creative, and open to trying new things in their careers or fields of study

Further, digital transformation is a fast-changing set of strategies because of evolving demands and the need for digital operations and the expansion of supply chain networks [9]. Design, manufacturing, marketing, sales, and presentation functionally use the internet; thus, we need to employ a data-based management approach. Additionally, it contains security, simulation, the internet, and cyber security. These definitions suggest thorough motivation, creativity, and impact in digital transformation. Design of digital value networks, usage of information technology, digital design of business model alternatives, and customer feedback are all simple tasks for SMEs [10]. Setting up open communication between entrepreneurs and IT professionals also helps combat fraud. Governments and stakeholders should support policies that promote digital transformation for small- and medium-sized businesses. The organization intends to beneficially alter business models and corporate processes to move on to the next phase of its digital maturity. In light of how these elements can be divided, they can be classified as corporate features, lack of competent staff, limited understanding of the technology required, infrastructure, lack of marketing and digital transformation, ICT and e-commerce adoption to stabilize the environment [11].

Technology tools explore new prospects that can aid existing business processes, therefore widening the target market. The challenge for businesses facing a pandemic is boosting their marketing efforts using web applications. Because of this, they can handle problems in the sales and distribution processes. SMEs provide products via social media, offering discounts, and participating in digital transformation [12]. Four elements of digital transformation can be addressed: (1) It is critical to ensure that the business remains competitive; (2) it is necessary to implement efficient business procedures; (3) increasing consumer happiness; and (4) making strategic decision-making easier for business. If companies are compelled to move, for example, due to online apps being developed to meet business needs, then digital transformation could be of significant value. Online portals connecting business with raw supply producers could supply the supply chain [13].

Businesses must compete more fiercely since digital transformation can lower costs in numerous ways. Third, strengthen digital business knowledge and skills. The reality is that some firms merely use websites to get their message out. Businesses often make digital transformation decisions when they are not well informed, and this lack of awareness often results in decisions that are not relevant to the organization's demands. Finally, including e-wallet solutions into the system would.

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## 3. Sustainability in SMEs

As a result of Covid-19, the steps that have been taken to ensure long-term Sustainability in SMEs are promoting businesses and products with social media. Promotional activity can include a product or business display and marketing efforts [14]. Companies use digital media to grow their brands and build new customer loyalty, which is why companies have turned to online communities to boost brand loyalty. Getting to know customers on a large scale and proactively is made much easier with digital marketing. Finally, the owner can conduct digital marketing analysis to discover how effective their strategy is.

A company must maintain adequate cash flow to manage its cash effectively. Late payment and billing to business partners are now a problem. Therefore, online software can assist in the creation of invoices and receipts. Re-budgeting is the process of making changes to your budget so that your priorities are taken care of while maintaining your current financial status [4, 15]. To ensure the business keeps running, the risk must be accepted. When recording the realization of sales and operational expenses, business owners provide an income and expenditure budget item as a reference so that profit margins can be controlled. In addition, business owners can use income and expense reports to analyze the numbers, make more sound decisions on matters with a high cost and monitor their expenses. Business owners can monitor business transactions by automatically reconciling banks' cash and bank accounts [16].

Additionally, to speed up the reconciliation process, account balances that have not been recorded are compared with corresponding transactions based on the same number, date, or description. The inventory measures the buying and selling prices of the stock continuously to aid in running the business. It informs stock availability, such as popular products, thus assuring product availability [17, 18].

### **3.1. Motivation and objective**

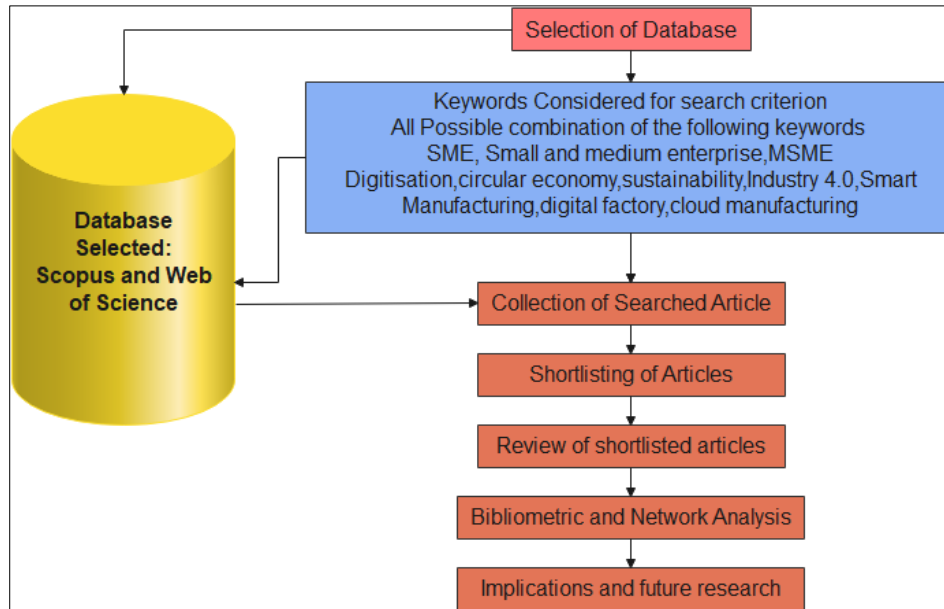
While the pandemic of covid-19 was taking place, the things that could be considered were the healthy economic process and excellent sales. It is possible to facilitate safe and comfortable purchases by promoting them. Additionally, the role of logistics is not only focused on shipping goods to customers but also encompasses the flow of raw materials throughout the supply chain [19]. And, to make matters worse, the number of available stocks has dropped. To have a digital transformation, we will have to use digital methods. To avoid a sharp drop in sales, the government prepared a fiscal stimulus for small businesses, including extending bank loan repayment terms [20].

Additionally, the government handles any disputes that arise, including the distribution of illegal goods and others. The business strategies that SME actors carry out ensure income stays the same. The expectation is that business-to-business (B2B) SMEs may use data to make critical business decisions and responsibly deal with the responsibilities of a business [8].

The use of technology is critical to the long-term sustainability of business operations in the current economic climate. The point of this is that by using cloud-based accounting software, the organization will leverage cloud-based technology. It makes it easier for the owners to access financial reports without having to worry about getting hacked. Companies can also utilize inventory, sales, and expense tracking systems along with workflow tools that can help save precious company time. Companies can use accounting services to drive their business, as cloud-based accounting services provide a better alternative. Businesses and SMEs must be brought into an economic ecosystem. It is possible to promote change and new ideas [21].

### **3.2. Review Methodology**

A literature review is the most critical element of a research paper since it provides valuable information and insights into the topic under investigation. It also aids in developing research directions for future research [22]. Following a thorough examination of the research study, various research gaps were discovered, which must be investigated to strengthen the research work. The review technique proposed by Saunders et al. is used in this study (2009). A systematic review was created by defining keywords and searching articles in various databases for articles related to those keywords [23]. Articles in the fields of sustainable production in the context of digitalization were identified in this study. Articles were gathered from the WOS and SCOPUS databases, including the most incredible collection of peer-reviewed publications ever published [24]. Almost all reputable publishers are represented in WOS, including IEEE, Emerald Insights, Springer, Taylor and Francis, Elsevier, Wiley, SCOPUS and Inderscience. The flow chart in Figure 1 depicts the review process followed in the current study.



**Figure 1** Research Methodology

### 3.2.1. Choose a database

The authors used the WOS and SCOPUS databases to gather publications concerning the green economy and Sustainable Production in digitalization for this study. Both the SCOPUS and WOS databases were used in this study to allow for a broad area.

### 3.2.2. Choosing Keywords

The selection of keywords is an essential part of the article collection process. For the collection of articles, the keywords "SME", "Small and medium enterprise", "MSME", "digitization", "circular economy", "sustainability", "industry 4.0", "Smart-Manufacturing", "digital factory", "cloud manufacturing" were used in all possible combinations.

### 3.2.3. Collection of articles

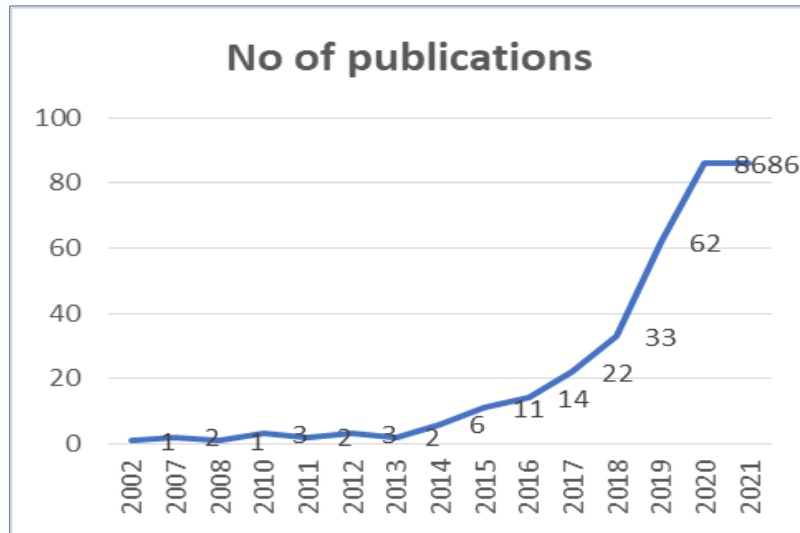
A total of 379 (330 in Scopus and 49 in the Web of Science) articles were found in both SCOPUS and WOS databases using keywords considered in this study. Book chapters, editorial remarks, and PhD thesis were excluded.

### 3.2.4. Refinement and shortlisting of articles

For article refining, they were selected based on the extent of their research. Articles with the same keyword combination that was not unique were deleted. For further study, we narrowed the field to 223 papers.

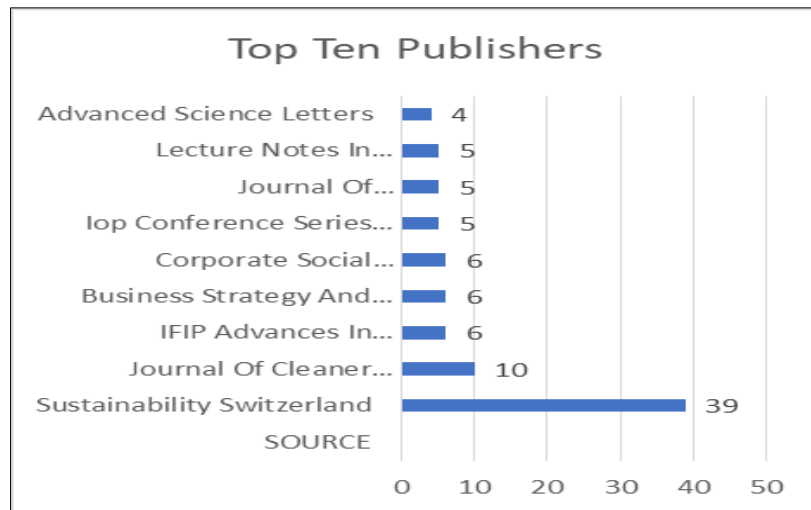
## 3.3. Bibliometric Analysis

The bibliometric analysis aimed to illustrate the scientifically significant contributions made by researchers, nations, and universities. A sensitive tool for analysing research outputs using statistical methods is bibliometric analysis [24]. Network analysis helps with the examination of researcher collaboration. It includes cross-national collaboration among writers as well as co-citation analysis. For bibliometric analysis, a wide range of software programmes are available, each with unique advantages and disadvantages. Packages that are available are Histcite, publish and perish, Gephi, R package, and VOS viewer. Because of their robustness, the R package and VOS viewer were chosen for the current investigation. The online tool Biblioshiny, which offers a model user interface for carrying out bibliometric research, is one of the advantages of the R package. In this study, we performed network analysis using the VOS viewer and bibliometric analysis using the R programme. Figure 2 shows the number of publications produced each year in sustainable practice and digitization during the digitalization age.



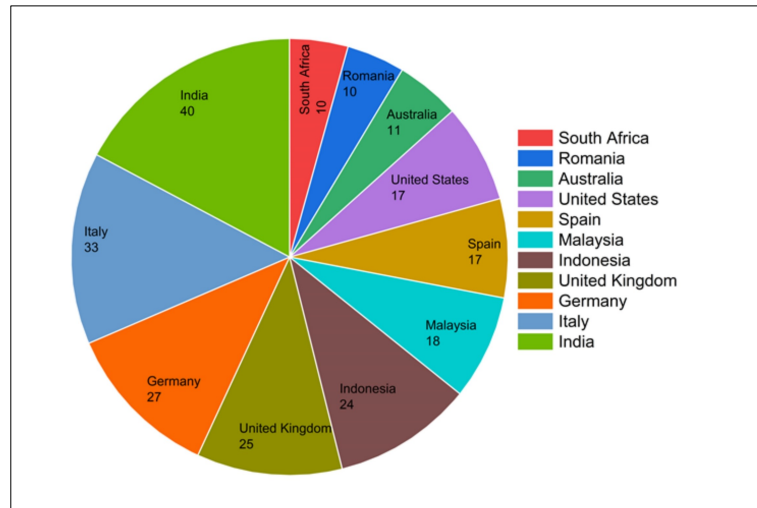
**Figure 2** Number of publications year wise

Figure 2 shows an upward trend, especially from 2015 onward. In the era of digitalization, the number of publications published in sustainable practice and digitization in the years 2019,2020 and 2021 is 33,62,86, respectively. Figure 3 shows the top contributing sources of articles examined using the R tool.



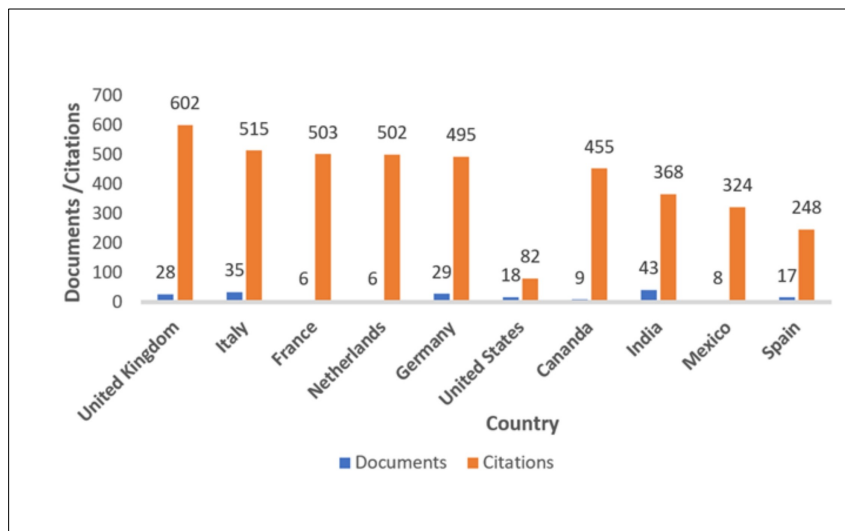
**Figure 3** Top contributing sources in the field

The top contributing sources in sustainable practice and digitization in the digitalization era are “Journals of Sustainability Switzerland, Journal of Cleaner Production and the IFIP Advances in Information and Communication Technology” with 39,10 and 6 papers, respectively. Country-level statistics were evaluated using the R software. Figure 4 shows country-specific publications, revealing that India, Italy and Germany, were the leading contributors in sustainable practice and digitization in the digital era, with 40,33 and 27 papers, respectively.



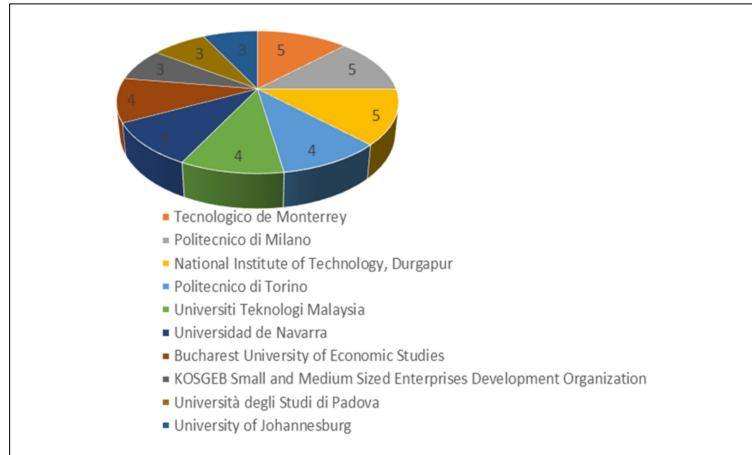
**Figure 4** Country-specific publications

Figure 5 shows the results of the country-by-country analysis of citations. India, Italy, and Germany are the most mentioned countries in sustainable practice and digitization in the digital era, with 43, 35 and 29 publications. The United Kingdom tops the list with 602 citations, followed by Italy and France with 515 and 503 citations.



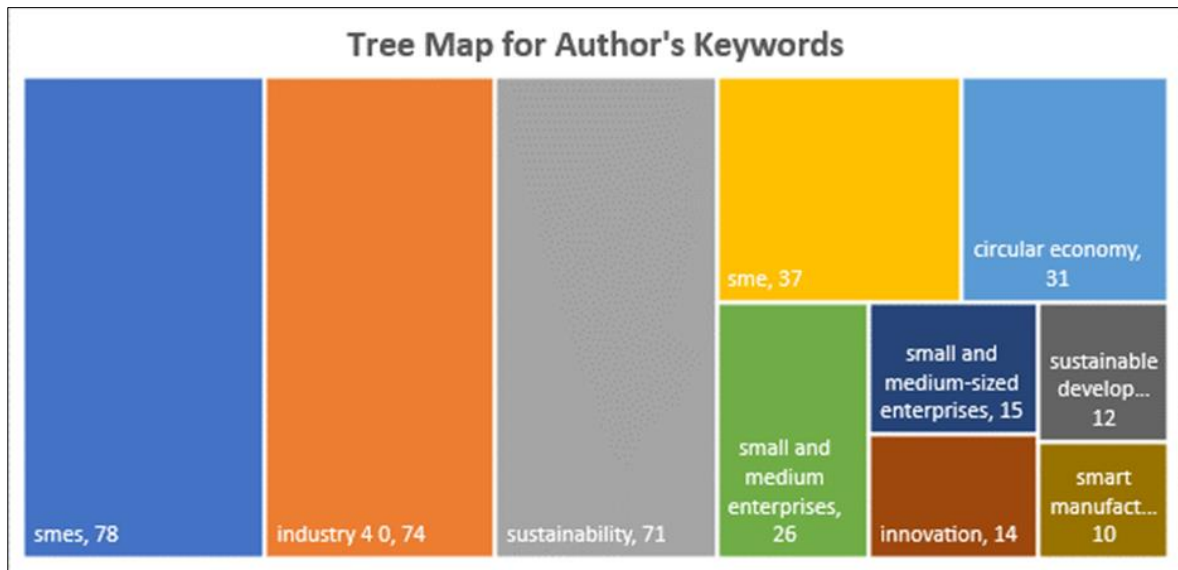
**Figure 5** Country-wise Publication with citations

Figure 6 shows the top ten institutions publishing articles in sustainable practice and digitization in the digital age. The Tecnológico de Monterrey, Politecnico di Milano and National Institute of Technology, Durgapur, were the three institutions where authors researched and published five documents each.



**Figure 6** Documents by affiliation

The R software was used to evaluate keywords, and a keyword treemap was created using the Biblioshiny online interface, as shown in Figure 7.



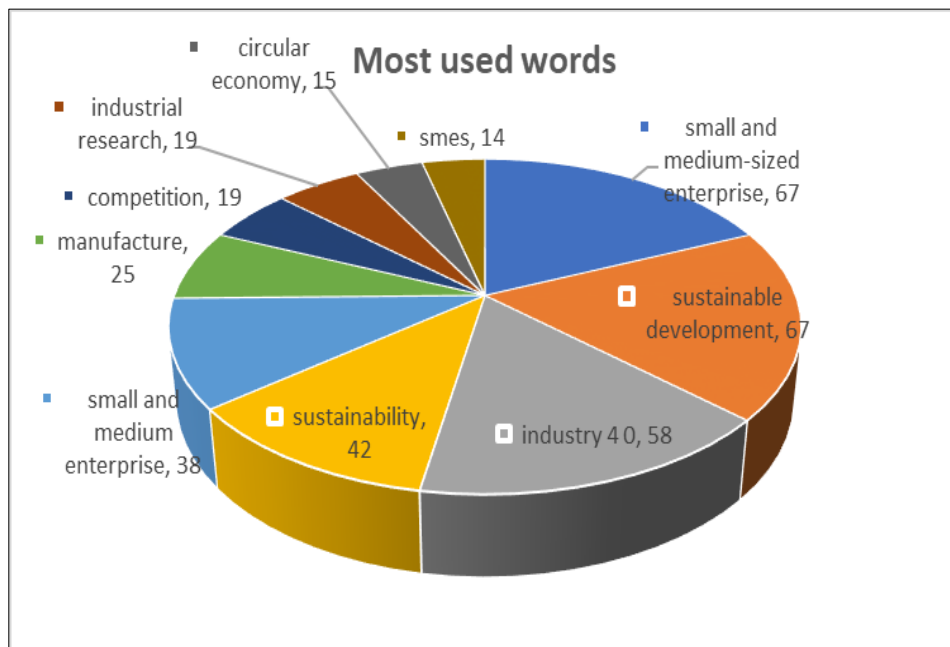
**Figure 7** Tree Map for Author's Keywords

As relevant from the treemap, the authors have primarily used SMEs, Industry 4.0, sustainability as keywords in their research publications. 'SMEs' being used 78 times is followed by industry 4.0 used 74 times, and sustainability was used 71 times by the authors as the keyword.

**Table 1** Top ten cited articles

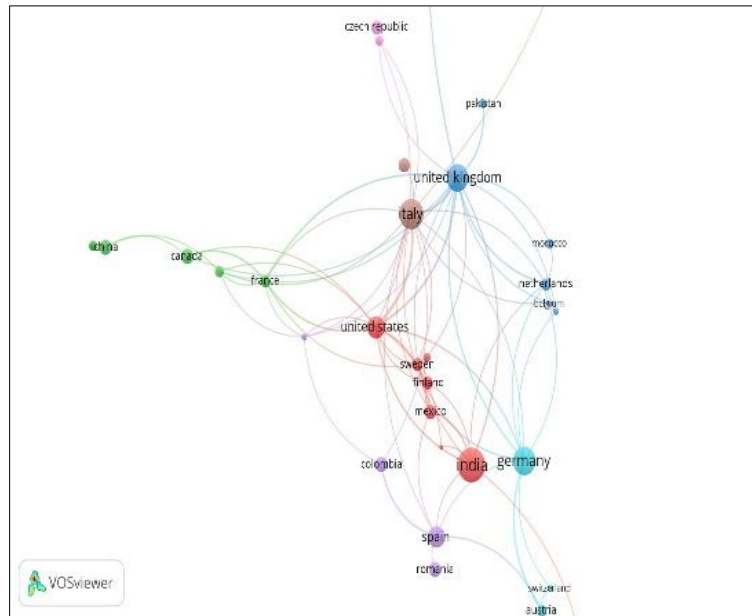
Paper	Total Citations	TC per Year
MOEUF A, 2018, INT J PROD RES	341	85.25
MITTAL S, 2018, J MANUF SYST	250	62.5
RIZOS V, 2016, SUSTAINABILITY	246	41
GANZARAIN J, 2016, J IND ENG MANAGE	142	23.6667
MASUREL E, 2007, BUS STRATEGY ENVIRON	140	9.3333
MÜLLER JM, 2018, INT J PRECIS ENG MANUF GREEN TECHNOLOGY	101	25.25
BIONDI V, 2002, INT J TECHNOL MANAGE	97	4.85
DEL GIUDICE M, 2017, J ORGAN BEHAV	77	15.4
BURKE S, 2007, ROB COMPUT INTEGR MANUF	73	4.8667
MOEUF A, 2020, INT J PROD RES	70	35

in sustainable practice and digitization in the digital age, as determined by the R programme. Table 1 shows that Moeuf A. (2018), Mittal S. (2018), and Rizos. (2018) were the top three most cited documents in sustainable practice and digitization in the digital era, with 341,250 and 246 citations, respectively. The authors used a VOS viewer to do network analysis. It depicts a network of authors from many countries, as well as a collection of materials. Figure 9 shows how co-authors from various nations researched on sustainable practice and digitization in the digital age.



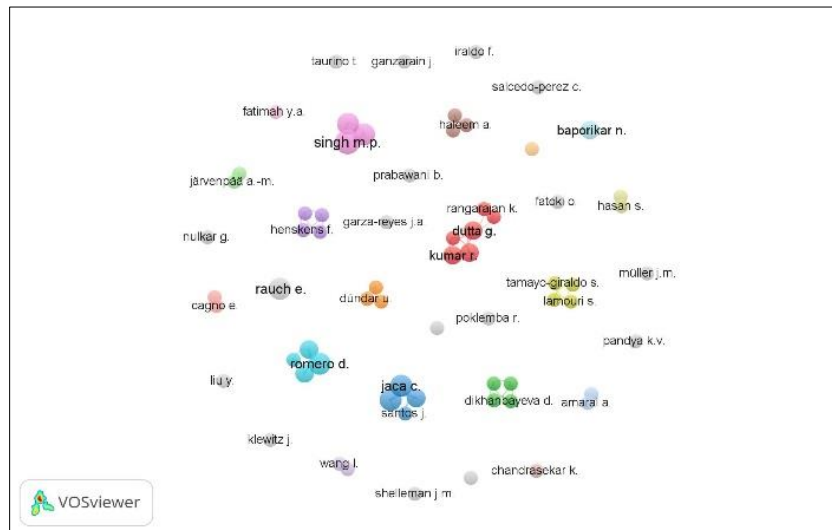
**Figure 8** Treemap of the most used words





**Figure 9** Country Collaborations

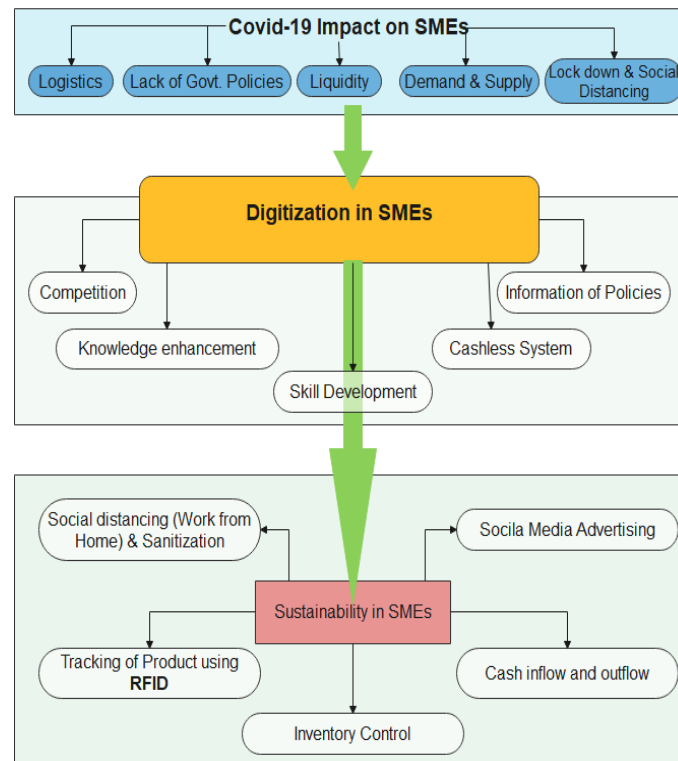
The VOS viewer was used to examine article co-citations. When two separate articles are cited in the same article, this is known as co-citation. Figure 10 depicts the co-citation of works about sustainable practice and digitization in the digital age.



**Figure 10** Co-citations of articles

### 3.4. Proposed framework for sustainability

Considering the factors of digitization and sustainability in SMEs in response to the pandemic, a framework is proposed for the optimum efficiency of the small business. Figure 12 represents the overview of the framework. Bibliometric analysis was done to provide a framework for the sustainable development of SMEs with the help of digitization. SMEs face several challenges which hinder them from adopting digitization [25]. The significant challenges are the financial constraints, lack of technological knowledge, competition from the e-commerce companies, registered-unregistered status of the enterprise, issues in getting loans from banks.



**Figure 11** A framework of digitization for Sustainability in SMEs

Financial constraints prevent the SMEs from investing in the technologies as they don't have any extra money, so they remain deprived of the advantages of implementing digitization [26]. The only solution to their problem to make them sustainable is to make use of cheap technologies like RFID to control the raw material from the start of the manufacturing process to the finished product delivery to the customer, and mobile applications can help them to make their online presence on social media and promote their business. There exist a positive relationship between advertising on social media and Sustainability in SMEs [27, 28]. It may help them reach a more extensive customer base and thus increase their sales.

Digitization pushes them to learn new technologies and enhance their skills, thus making them more competitive to face the challenge from their competitors [29]. With the knowledge enhancement of the workforce, SMEs develop new products in the form of innovation. Using a cashless system like NEFT, mobile banking IMPS, or other digital methods like android payment applications decrease the burden of maintaining their accounts.

The use of information technologies helps them be aware of the government policies and benefit by getting themselves registered to benefit from the policies. These registrations also facilitate them to get loan approvals from the country's leading banks. There be a better understanding between the government and the SMEs [30]. Specialist SMEs are engaged in providing technological solutions that can be benefitted by adopting the work from home, reducing the operating cost, thus making this a chance in their favour to be more sustainable [31].

#### 4. Discussion

As a result of using social media, businesses and their consumers have a better mutual understanding of each other, as well as an increased awareness of their brands. This means that SMEs may take full use of social media to sell, advertise, and market their products and services at a low cost. With the introduction of social media and its use by SMEs, customers now have several options for online interaction. New markets and possibilities are expected to open because of the Covid-19 epidemic and the increasing online consumption and behaviour, according to the authors of this study. SMEs may use social media to keep their consumers engaged while staying focused on their unique goals. This is because customers are enabled, through social media, to gather appropriate information on a given product or service before it is purchased. Management of SME firms inside developing nations in the SME sector may firmly rely on social media to attract more consumers, which will consequently have a beneficial influence on its long-term viability. Entrepreneurs increased reliance on digital marketing tools, encourages them to think more creatively [32]. That modern-day SMEs

will embrace a more direct method to communicate and collect feedback through more effective communication techniques, given that the old medium of communication is progressively becoming obsolete. As a result, not only would business-to-customer connections be strengthened, but SME would be better positioned to compete for market share. Because of this, firms that rely too much on conventional means of communication will be left behind as the world shifts toward internet commerce. Social media sites such as Facebook, LinkedIn and Twitter may be utilized as a communication channel. Traditional company strategies, models, and processes have been fundamentally altered by the fast growth of digital technologies that enable new enterprises to incorporate new technology into their business models and processes. SMEs are facing the issues of sustainability in tough times. The condition of the unregistered SMEs is the worst. All manufacturing industries are going through a transformation. The SMEs need to cope with the pace of the transformation, which can be achieved by adopting technologies that do not require high technological skills. A framework is proposed to achieve Sustainability in SMEs, which will help SMEs attain sustainability using the technologies available in the fourth industrial revolution (Industry 4.0). This framework will help SMEs survive and grow while following the appropriate pandemic guidelines like social distancing and sanitization. RFID, social media, cashless payments; will enhance their growth by saving time and money. They can control their inventory and over-production. To get the full benefits of a digital platform, more money and invest in its growth. For a firm to reap the benefits of online digital platforms, management must be willing to invest in the technology. Implementation of the technology will impel the employees to learn new technologies and improve their skills. This in turn will lead to the increase in production of the SMEs, increasing their profit and reachability to the customers.

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## 5. Conclusion and Future Scope

The fourth industrial revolution has a tremendous influence on the whole business. Using sensors and algorithms, communication and logistics operations will become integrated and intelligent, resulting in an increase in digitalization and a decrease in manual labour. Expect a new level of planning and inventory management optimization in the near future. To remain competitive in the future, SMEs are urged to understand the impacts of Industry 4.0 as soon as possible and react accordingly. Many technical implementations need both financial and human resources to bring ideas to reality. SMEs tend not to be early adopters of new technologies because of the risk associated in investing there in wrong ones. The choice to implement technology to digitize the firm is a cost-benefit analysis that must be linked with the company's brand strategy and image. Every part of the business should be digital; however this may not be feasible or desired for every business. Customers should be included at every phase of the transformation process.

Companies' reluctance to embrace Industry 4.0 can be explained by the fact that organizational and financial considerations take precedence. Firms are reluctant to invest in technology because of the high cost and lack of return on investment. Making favourable judgments will be easier for corporate leaders if they understand how the industry 4.0 transformation contributes to competitiveness and the development of financial solutions.

With digital transformation, SMEs can achieve sustainability. According to the findings, social media is a beneficial instrument that will increase the operations, profitability, and sustainability of SMEs in this period. According to the research findings, social media is an effective marketing strategy that should be deployed, and it has increasingly ceased to be a choice for SMEs, but rather a strategic tool to fulfil the expanding and sophisticated expectations of the modern-day customer. When a result, as the SME efficiently meets the demands of the consumer, it will become self-sustaining. Businesses can be encouraged to develop through various government policies, such as concessional loan instalments and tax exemption. This study will likely offer recommendations to parties who are either helping to increase the existence of SMEs that have a positive impact on SMEs or seeking to lower the number of SMEs that hinder the health of the SME sector. The government need to frame the policies specific for this sector instead of treating all under one umbrella. One policy can't fit all. Additional research can show the framework's merits by validating the framework design. The questionnaire survey will collect data about the creative industry, and some creative industry stakeholders will be interviewed extensively for validation. This article does not address the risks associated with adopting new concepts in the context of Industry 4.0, which subsequent research might further contribute to the framework.

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## Compliance with ethical standards

### *Acknowledgments*

Author would like to express deepest gratitude to those who have contributed to the completion of this research paper. Our sincere appreciation goes to Dr. Sumit Gupta, Assistant professor, Amity University, Noida for his invaluable guidance and mentorship throughout the research process.

*Disclosure of conflict of interest*

The authors declare that they have no conflict of interest.

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