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SHAPING NEW BOUNDARIES AN ANALYTICAL SYMPHONY ON TECHNOLOGICAL ADVANCEMENTS IN CORPORATE, NON-PROFIT SECTORS AND SOCIAL ENTREPRENEURSHIP

Dr Vidyadhara Hegde S[1], Dr. Ganesha S[2], Dr. Udaya Shetty K[3], Dr. Sudarshan P[4], Dr. Kiran Kumar Thoti[5]

[1]Associate Professor of Commerce, MPM Government First Grade College, Karkala, Udupi District 574104, Karnataka, India
[2]Associate Professor of Commerce, MPM Government First Grade College, Karkala, Udupi District 574104, Karnataka, India
[3]Associate Professor of Commerce, Government First Grade College & Centre for PG Studies, Thenkanidiyur, Udupi 576106, Karnataka, India
[4]Associate Professor of Commerce, MPM Government First Grade College, Karkala, Udupi District 574104, Karnataka, India
[5]Associate Professor, M.S. Ramaiah Institute of Management, Bangalore, 560054 Karnataka, India

ABSTRACT

Investigation to provide a comprehensive and illuminating picture of the dynamic scene formed by technology progress at the crossroads of social entrepreneurship and business. To get relevant results from the vast Scopus database, the study painstakingly uses a sophisticated search approach, inserting terms like "technology," "innovations," and "business" into the intricate web of ever-growing body of literature. A modern and representative dataset, suitable for in-depth study, is assured by this careful curation process. This study aims to do more than just identify trends; it will also investigate different document types, identify notable authors, identify influential source titles, identify primary themes within the ever-changing field of social entrepreneurship, and more. The analysis quantitatively examines publication trends, citation counts, and complex keyword co-occurrence patterns using a rigorous and thorough methodology. The study uses cutting-edge visualization methods to create a detailed map of the research environment, showing how different areas of study are connected and grouped together based on themes. From the revolutionary effect of AI on company models to the favourable relationship between technical innovation and the creation of jobs in small enterprises, the synthesis findings culled from influential studies cover a wide range of subjects. The study also elucidates the significance of innovation in reaching sustainability targets, the continuous digitization of company models, and the revolutionary impact of FinTech on the conventional financial services industry. Ultimately, this extensive bibliometric study makes a strong case for a more organized, sophisticated, and illuminating comprehension of technical advancements in the complex domains of social and corporate entrepreneurship. By providing an up-to-date and thorough overview of the changing scene and by naming and recognizing important players, it enhances the conversation around this dynamic juncture. Because of its comprehensive nature, the research is an excellent tool for academics, professionals, and politicians who are interested in learning about and making a difference at the revolutionary crossroads of social entrepreneurship, technology, and commerce. Keyword: Technological Innovations, Business, Bibliometric Analysis, Artificial Intelligence, Sustainability.

Corresponding Author

Dr Vidyadhara Hegde S,
vidyadhartime@rediffmail.com

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1. INTRODUCTION

The intersection of technological innovations in business and social entrepreneurship has not only reshaped traditional paradigms but has also fostered unprecedented advancements, giving rise to a dynamic and evolving landscape. This

bibliometric analysis aims to unravel the intricate tapestry of technological evolution within these realms. Recent scholarship has witnessed a surge in studies exploring the implications of artificial intelligence for business strategy, the integration of blockchain in social entrepreneurship initiatives, and the pervasive influence of data analytics in shaping innovative solutions for both commercial enterprises and social impact organizations. Several noteworthy bibliometric analyses have delved into the intricate relationship between technology and social entrepreneurship. For instance, a comprehensive study conducted by "Janik, A., Ryszko, A., & Szafraniec, M. (2021)" aimed to identify research patterns and trends in the scientific literature on social innovation. Similarly, Floris, A. D., & M. (2023) focused on a bibliometric analysis of academic studies centered around technology in social entrepreneurship, spanning the years from 1990 to 2019. These analyses play a pivotal role in comprehending the trends in the development of social entrepreneurship, shedding light on the crucial role of technology and digital innovation in this field"(Trabskaia, I., Gorgadze, A., Raudsaar, M., & Myyryläinen, H., 2023)." The palpable velocity of technological progress is unmistakable, and current research trends underscore the dynamic nature of this domain. By immersing ourselves in this contemporary discourse, we can distill insights that not only illuminate the trajectories of technological innovations within the business and social entrepreneurship spheres but also provide a comprehensive understanding of the current trends, the dynamic landscape, and the influential contributors shaping the discourse on technological innovations in business and social entrepreneurship.

2. LITERATURE REVIEW

Baucus, M. (2019) stated that artificial intelligence (AI) has significantly transformed industries, exemplified by the success of companies like Airbnb and Uber, which have leveraged AI to pioneer innovative business models. However, the intricate influence of AI on business model innovation remains not fully comprehended (Arumugam et al., 2023). While many businesses face vulnerabilities from AI-empowered competitors, this study takes a proactive stance, focusing on how AI can drive business model innovation. Positioned as a catalyst, AI is explored in terms of its transformative impact on business models, with a case study showcasing two companies that successfully innovated using AI. The study emphasizes the role of executives in fostering an AI-centric culture to facilitate business model innovation. Ultimately, companies' adept at harnessing AI has the potential to bring about disruptive innovation, reshaping the global competitive landscape. Akabane, G. K., (2019) stated the ramifications of technological innovation on job generation in small businesses within developing nations. The results indicate a favorable correlation between technological innovation and employment expansion in small enterprises, thereby fostering economic progress. The study also highlights the importance of effectively utilizing information technology in these businesses, as it enhances competitiveness and provides access to international markets (Thoti, 2015). To improve performance and promote job creation, the study recommends government intervention in the form of developing technology innovation strategies for small businesses. Overall, the research findings and proposed theoretical model contribute to existing theories and provide valuable insights for policymakers in understanding the role of information technology innovation in fostering job creation and economic development. Zhang, Y (2019) mentioned that organizations pursue diverse objectives encompassing competitiveness, profitability, and long-term survival. However, in contemporary contexts, sustainability has emerged as a pivotal focus for both business and non-business entities, serving as a catalyst for superior performance. Despite the extensive exploration of factors influencing sustainability, the role of innovation in this context has been inadequately addressed. This research delves into the impact of both management and technological innovations on organizational performance, with sustainability acting as a mediating factor. Employing structural equation modelling and drawing on empirical evidence from 304 Pakistani CEOs and top managers, the study illuminates that both forms of innovation significantly contribute to sustainability and overall organizational performance. Notably, sustainability is identified as a partial mediator in the relationship between management innovation and organizational performance, as well as between technological innovation and organizational performance. The study advocates for the prioritization of management and technological innovation by CEOs and top managers, emphasizing their role in enhancing sustainability for long-term organizational survival. Additionally, the implications of these findings are thoroughly examined and discussed. Roig-Tierno, N. (2019) proclaimed the predominant obstacle confronting the growth of firms in the contemporary landscape is the proficient integration of digital technologies into innovative business models. Consequently, businesses are progressively adopting digital transformation initiatives to digitize their existing models, leveraging digital technologies to optimize both internal and external processes. This entails the assimilation of digital elements into novel business frameworks. The digital transformation journey necessitates a

diverse range of knowledge from various sources within the organization. This study critically examines fundamental concepts associated with the digitalization of business models and provides a conceptual matrix, offering firms guidance in the process of digitizing their business models. Furthermore, the study introduces seven contributions within a special issue cantered on knowledge and innovation in business. The conclusion provides suggestions for prospective studies, highlighting the dynamic evolution of work environments and digital personas within organizations. Masri, M. (2020) given that financial technology (FinTech) plays a pivotal role in broadening access to financial services, especially for individuals currently underserved. It transforms the way people interact with banking products and services by leveraging non-banking providers, leading to alterations in payment methods, money transfers, borrowing, lending, and investment practices. The integration of finance with smart mobile technology through FinTech gives rise to innovative business models and financial solutions. While it has not entirely replaced traditional financial services, FinTech introduces automation, user-friendly interfaces, efficiency, and transparency, mirroring features found in the banking and financial sectors. This study delves into the conceptualization and characteristics of FinTech, offering case studies that specifically highlight local FinTech initiatives in Indonesia. Employing text mining analysis, the research uncovers correlations and patterns within FinTech characteristics. The case analysis draws comparisons between local FinTech ventures in Indonesia and global players, suggesting that local FinTech organizations have the potential to competently coexist with their international counterparts in the local market. Chege (2020) pronounced that the relationship between technological advancement, ecological sustainability, and their consequent impacts on the performance of small enterprises. By utilizing a sample comprising 204 small businesses and employing hierarchical regression models for analysis, the survey outcomes reveal a positive impact of technological innovation on the performance of small businesses, particularly when proprietors prioritize environmental sustainability. Businesses actively involved in supporting environmental community projects and promoting social well-being, extending beyond mere economic responsibilities, demonstrate a propensity for achieving heightened financial success. The research underscores that innovations in managerial approaches and increased employee engagement in environmental protection practices not only contribute to improved company performance but also elevate its standing among stakeholders. The findings not only augment existing theories but also advocate for the widespread adoption of sustainable practices, regardless of the developmental stage of countries. Fernando. Y (2019) given the heightened environmental awareness; businesses are increasingly exploring eco-friendly practices. This research addresses a significant gap by investigating the influence of eco-innovation on business sustainability and introduces a fresh framework considering the mediating role of service innovation capability. Through empirical analysis involving a survey of 95 Malaysian firms utilizing green technology, the findings demonstrate that eco-innovations contribute to improved sustainable performance. Additionally, service innovation capability partially mediates this relationship, serving as a strategic advantage against new competitors. As the inaugural study of its kind in the Malaysian context, this research underscores the crucial roles of eco-innovation and service innovation capability as intangible assets for long-term goals, competitive edge, and business sustainability. Stelzl, K. (2021) Expressed that this endeavour cantered on exploring the interplay between digital innovation and business process management (BPM) through a series of four one-hour sessions involving around 120 practitioners and several academics. The primary aim was to enhance theoretical frameworks in this research area with practical insights derived from organizational practice. Lüdeke-Freund, F. (2019) Asserted that the convergence of digital advancement and business process management (BPM) occurred through a sequence of four one-hour sessions involving approximately 120 practitioners and several academics. The principal objective was to enrich the theoretical underpinnings within this research domain by integrating pragmatic insights gleaned from organizational practice. Long, T. B. (2020) explained the concept and implementation of responsible management of innovation, emphasizing its role in addressing societal challenges and mitigating unintended consequences. Responsible innovation is crucial in developing innovations that consider the well-being of society. Managers, as influential figures in innovation, require knowledge and awareness of how to apply responsible innovation in their roles. Despite practical and conceptual challenges, this chapter focuses on the potential of responsible management of innovation processes to yield economic and societal benefits. It examines these aspects from the perspective of individual managers, organizational levels, and the broader innovation system. Väisänen, J. (2021) Asserted that digital technology in practical contexts enhances resource circulation and value generation within circular economy business models. The study presents empirical findings on alterations in resource circulation and value generation through a multiple case study involving four pioneering enterprises in Northern Europe, facilitated by digital technology, highlighting the essential role of knowledge creation. Additionally, the paper proposes a framework that delineates four categories of business model innovation for the circular economy propelled by digital technology. These classifications span from incremental to radical

enhancements in resource circulation and wealth generation, offering theoretical insights into both business model innovation and the role of digital technology in the circular economy. The document provides pragmatic recommendations for managers, identifying suitable digital technology and stressing its imperative nature. Kapoor (2020) given that the surge in intelligent products and services prompts an exploration into the enduring impact of artificial intelligence (AI), questioning whether its current ascent is a transient trend or possesses the potential for a profound global transformation. This investigation meticulously examines the multifaceted effects of AI on governments, communities, companies, and individuals, encompassing the entire spectrum from research and innovation to practical deployment. The paper scrutinizes both the positive and negative implications of AI, evaluating its influential academic achievements and innovations and their subsequent impact on entrepreneurial activities and global markets. By delving into two lists identifying the top 100 AI start-ups, the research aims to discern the driving forces behind AI advancement. The insights derived from this study aspire to deepen our understanding of AI's innovations and its transformative impact on businesses and society, contributing to a nuanced comprehension of how AI has the potential to reshape global economic operations. Lestari, (2020) Asserted that empirical research models contribute to achieving heightened competitiveness and optimal performance. The inquiry delves into the direct, mediating, and indirect impacts of entrepreneurial insight factors, market orientation, knowledge dissemination, innovation, managerial capacity, product strategy, process and service enhancement, and resource proficiency on performance and competitiveness.. Akpan, (2020) stated that the COVID-19 pandemic has accentuated the pivotal role of cutting-edge technologies in navigating business operations during lockdowns, underscoring their significance not only for gaining competitive advantages but also for survival and the adaptation of business models. Originally focused on addressing challenges related to technology awareness, adoption, and implementation for businesses in the fourth industrial revolution, the paper now underscores how the pandemic has expedited the imperative for digitization and remote operations, transforming technologies from being considered "nice to have" to becoming "critical to have." The study identifies essential technologies, assesses disruptive software platforms, and delineates strategies for fostering and managing innovation in small businesses amid the current complex and uncertain business environment. Key technologies highlighted include those facilitating social business creation, customer relationship management, new communication channels, virtual reality for remote operations, and the Internet of Things. Furthermore, big data and predictive analytics are deemed crucial for informed decision-making in the current challenging business climate. Christa, (2021), This research underscores the essential requirement for efficient resource management grounded in pertinent knowledge to sustain local product businesses. Conducted among 300 local product businesses in Central Kalimantan and Bali, the study utilizes SEM-AMOS statistical tools for quantitative analysis. The findings accentuate the pivotal role of proactive market orientation, with knowledge sharing acting as a mediator by 51%, and innovation by 63%, exerting a positive influence on business performance. Management activities encompassing Planning, Organizing, Actuating, and Controlling (POAC) emerge as significant contributors to upholding the resilience of local product businesses, particularly during challenging times. The research introduces a novel conceptual model based on the Knowledge-Based View (KBV), specifically tailored to enhance the performance of local product businesses amid the complexities of the COVID-19 pandemic. The implications of the study advocate for businesses to align with market orientation, adeptly identify changes and needs, and actively promote knowledge sharing and innovation to meet evolving consumer requirements. Liu (2020) Expressed that the impact of artificial intelligence (AI) on technological innovation is examined through both deductive reasoning and empirical modeling. The study utilizes industrial robot data sourced from the International Federation of Robotics (IFR) and panel data encompassing China's 14 manufacturing sectors spanning from 2008 to 2017. The results indicate that AI exerts its influence on technological innovation by fostering knowledge creation, facilitating technology spillover, enhancing learning and absorptive capacities, and increasing investments in research and development (R&D) and talent. Empirical findings, accounting for factors such as R&D intensity, foreign direct investment (FDI), ownership structure, and technical imitation, reveal that AI significantly fosters technological innovation. Additionally, the impact of AI varies across sectors, with low-tech areas experiencing a more pronounced effect on technical innovation. The study concludes by offering managerial decision-making recommendations based on these established findings. Gebauer (2020) the service-oriented influence of Internet of Things (IoT) technology on business models, with a particular emphasis on potential and problems for B2B manufacturing enterprises. Given the ongoing investigation into the impact of IoT on enterprises, particularly service-oriented business models in manufacturing, this article contributes by offering a map of digital servitization. This map helps to understand organizations' strategic shifts influenced by technology, providing both theoretical and managerial insights. Notably, the study emphasizes the importance of enterprises' sales models as key considerations in developing digital servitization plans. Furthermore, the article defines three levels of

digital servitization complexity—product-oriented, process-oriented, and outcome-oriented—each connected with increased usage of IoT technology, presenting unique problems and opportunities. Amran (2021) stated that the ramifications of ecologically friendly innovation practices on sustainable business performance within the technology sector, concentrating on 109 technology companies in Malaysia with both local and foreign ownership, set against a backdrop of a developing country context. Employing the partial least squares approach for analysis, the research unveils substantial findings. Notably, eco-innovation strategies encompassing eco-process, eco-product, and eco-organizational innovation contribute to distinct dimensions of sustainable business performance—economic, social, and environmental. Specifically, the implementation of an eco-organizational management system is found to enhance economic performance, while the enhancement of operational processes or the development of eco-friendly products positively impacts environmental performance. Moreover, the study reveals that market turbulence strengthens the positive effect of eco-organizational innovation on social performance. In conclusion, the study asserts the effectiveness of the research model in predicting and ensuring the capability of all endogenous constructs. Choi, P. K. (2020) says that the challenges posed by deindustrialization in the aftermath of the 4th industrial revolution, the recommended approach should be framed within the concept of an industrial ecosystem. This is attributed to the unique characteristics of industries associated with the 4th industrial revolution, distinguishing them from traditional manufacturing. The creation of value in agriculture and manufacturing varies significantly, necessitating differences in human types, social systems, and distribution systems. Drawing parallels with natural ecosystems that emphasize the interrelationship of organisms and their environment, industrial ecosystems aligned with the 4th industrial revolution demand new human attributes, support systems, and technologies. The paper advocates for a paradigm shift towards "Homo empathicus" from the conventional "Homo economicus" of industrial society. This transition signifies a move towards a reciprocal economy distinct from capitalism and the adoption of an autonomous democracy in contrast to a free democracy. Akpan (2020) Considering that the incorporation of digital technologies by small and medium enterprises (SMEs) in developing economies persists in encountering persistent challenges, notwithstanding commendable achievements, especially in emerging markets. Nevertheless, many SMEs operating in the informal sector within emerging markets and developing economies (EMDEs) face analogous hindrances hindering the adoption of state-of-the-art technologies. This article evaluates the assimilation of cutting-edge technologies by SMEs in EMDEs to enhance operational performance and establish sustainable competitive advantages. Papers featured in the Special Issue highlight FinTech, and analytical algorithms as current technologies employed by SMEs in EMDEs, notably in manufacturing and service industries. Despite these advancements, various advanced technologies, such as cloud computing, 'big data,' and predictive analytics, which hold substantial potential to enhance operations and strategic decision-making, are yet to witness widespread adoption in most EMDEs. The article underscores that the scarcity and restricted adoption of digital technologies in EMDEs contributes to business disruptions during events like the COVID-19 pandemic. To navigate the 'new normal' and global competition, the efficacious adoption of advanced technologies remains pivotal for SMEs in EMDEs.Van Looy, A. (2021) the impact of the information revolution on businesses has led organizations to seek digital innovation (DI) for their business processes and competitive anticipation. This mixed-methods study investigates the relationship between business process management (BPM) and DI, drawing on results from an international survey and expert panel perspectives. The study identifies a positive but moderate correlation, which is modified by a variety of contextual elements that influence strategic decisions. The research expands on the technology-organization-environment (TOE) framework by categorizing organizations in a readiness matrix based on their knowledge of digital process innovation (DPI). Distanont, A. (2020) stated the pivotal role of innovation in establishing a competitive advantage for small and medium-sized enterprises (SMEs) within the frozen food business. Employing a comprehensive approach, the research incorporates a literature review, empirical research utilizing questionnaires, and subsequent analysis through exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and structural equation modeling (SEM). The outcomes underscore that innovation significantly contributes to competitive advantages, influenced by a spectrum of external factors categorized into micro-oriented and macro-oriented factors. Notably, micro-level external factors exert a more pronounced impact on innovation development within frozen food businesses. The study underscores the imperative for entrepreneurs, particularly SME entrepreneurs, to adapt and prepare for forthcoming economic changes at global, regional, and national levels. Beyond internal contexts, the study emphasizes that external factors play a crucial role in fostering innovation, positioning it as a strategic tool for enhancing business competitiveness and achieving sustainable development. Bagheri, M., (2019) Asserted the correlation between internationalization orientation and the international performance of small and medium-sized enterprises (SMEs), concentrating on investigating the intervening role of technological innovation. While existing research underscores the importance of

internationalization for SME growth, its specific impact on international performance has remained ambiguous. Similarly, the well-established link between technological innovation and performance necessitates further examination, particularly concerning the implications of technological innovation on international performance. Conducted with a sample of 116 SMEs in the United Kingdom, the study reveals that internationalization orientation significantly influences international performance, with enhanced outcomes observed when SMEs adopt both inward and outward international orientations. Additionally, the research identifies a curvilinear relationship between technological innovation and international firm performance. Notably, technological innovation acts as a mediator for the impact of internationalization orientation on international performance, particularly for SMEs engaged in moderate levels of innovation activities. These findings underscore the potential for strategic decisions that combine internationalization orientation and technological innovation to significantly enhance international performance for SMEs. Zheng, (2021) given the impact of business model designs of blockchain-based entrepreneurial firms on product innovation, encompassing both disruptive and adoptive innovation. The findings of a survey of 159 blockchain-based companies show that a new business model greatly supports disruptive innovation but has no influence on adopting innovation. Conversely, an efficient business model significantly encourages adoption innovation while discouraging disruptive innovation. The data also shows that the firm's disruptive technical potential enhances the positive association between a new business model and disruptive product innovation while weakening the positive relationship between design efficiency and adoptive innovation. Moreover, revolutionary technical capabilities strongly encourage blockchain-based entrepreneurial enterprises to prioritize groundbreaking product creation over adoptive product innovation. Čirjevskis, A. (2019) stated in technology-focused mergers and acquisitions, dynamic skills play an important role in acquiring businesses' business model innovation. The study specifically looks at how two acquirers, Samsung and Microsoft, transformed operationalized components of their business models after acquiring technology-advanced enterprises, Harman and LinkedIn, in 2016. The empirical results are derived from qualitative data, leading to the formulation of a practice-oriented model. This model serves as a valuable reference for both seasoned scholars in the realm of dynamic capabilities and business models and those who are novices to the subject. The research contributes to the discourse on dynamic capabilities and provides perspectives for practitioners seeking to comprehend the connection between micro-foundations and attain a competitive edge through business model innovation in the context of merger and acquisition processes. Bouwman, H., (2019) tells the impact of digital transformation on small- and medium-sized enterprises (SMEs) and explores the potential enhancement of SME performance through increased resource allocation to business model (BM) experimentation and active engagement in strategy implementation. The research, involving 321 European SMEs leveraging social media, big data, and information technology for BM innovation, employs structural equation modelling and fuzzy-set qualitative comparative analysis for analysis. The findings reveal a positive association between augmented resource allocation to BM experimentation and proactive strategy implementation with overall firm performance. The study identifies diverse configurations of these factors influencing performance, providing SMEs with varied pathways to adapt to the impacts of digital transformation on their BMs. The insights gained offer valuable guidance for SMEs navigating the challenges of digitalization, presenting practical and policy implications for effective strategy implementation in the digital era. Oltra-Badenes, R (2020) stated that Customer Relationship Management (CRM) is defined as a set of technical solutions critical for efficient business management, with an emphasis on its benefits to entrepreneurial success. The study focuses on sustainability and proposes a methodology for evaluating the possible influence of CRM components (sales, marketing, and services) on the economic, environmental, and social dimensions of sustainability. The study's goal is to confirm hypotheses and better understand how CRM-related advantages contribute to the positive impact of its components on sustainability dimensions. The proposed research framework indicates that CRM, akin to Green IT, fosters digital transformation and sustainable business model innovation, establishing the foundation for a specific methodology to evaluate the influence and advantages of CRM on sustainable business models and innovation. Parida (2019) given digitalization is altering industrial value chains via IoT technology and data analytics, necessitating business model innovation to ensure long-term success. However, there are gaps in our understanding of how businesses might use digitization to improve their business models for sustainability gains. These editorials analyse the research landscape, identify issues in value development, delivery, and capture, and align these components to promote long-term strategies. The authors contribute by offering a framework for future study on the nexus of digitization, business model innovation, and industrial sustainability.

3. METHODOLOGY

In conducting the comprehensive bibliometric analysis titled "Revolutionizing Frontiers: A Bibliometric Symphony on Technological Innovations in the Spheres of Business and Social Entrepreneurship," a methodical approach was adopted, centering on the utilization of the Scopus database as the primary source for scholarly literature. The search strategy was meticulously crafted, focusing on specific keywords deemed integral to capturing the intricate intersection of technological advancements and innovations within the realms of business and social entrepreneurship. The keywords employed for this purpose were strategically chosen as "technology," "innovations," and "business." The Scopus database, renowned for its multidisciplinary coverage and extensive academic repository, served as the cornerstone for the identification and retrieval of relevant publications. The timeframe considered in the search encompassed recent years, ensuring a contemporary lens through which to examine the evolving landscape of technological innovations in these domains. Following the initial retrieval of the dataset, the subsequent stages of the bibliometric analysis involved a detailed quantitative exploration. This encompassed assessing publication trends, scrutinizing citation counts, and discerning keyword co-occurrence patterns. Advanced visualization tools and software were adeptly leveraged to map the intricate research landscape, pinpoint influential authors, and illuminate emerging themes embedded within the scholarly discourse. The overarching aim of the methodology was to furnish a systematic and insightful exploration of technological innovations in business and social entrepreneurship. By harnessing the power of Scopus and employing a robust bibliometric approach, the analysis sought to unravel the complexities of these domains, offering a nuanced perspective on the transformative impact of technology within the spheres of business and social entrepreneurship.

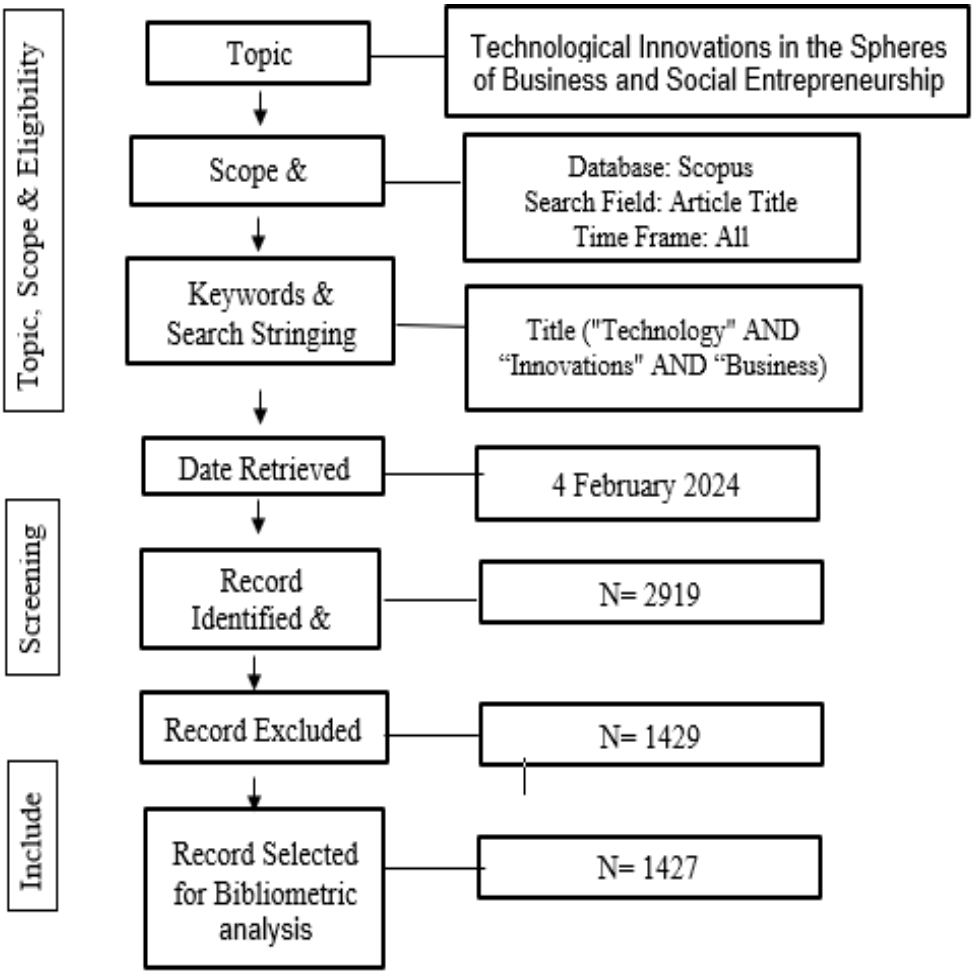

Figure 1 Flow diagram of the search strategy

4. RESULTS AND DISCUSSION

4.1 TRENDS IN PUBLICATIONS

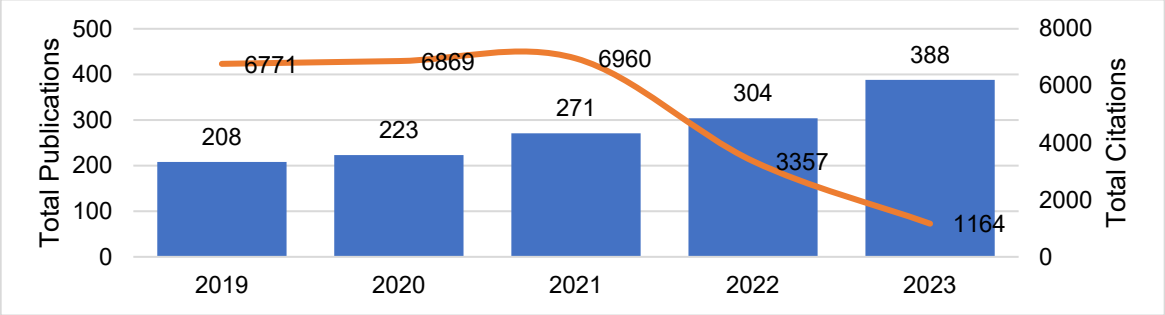

Figure 2. Total Publications and Citation by Year

Figure 2 shows the trends observed in the publication landscape from 2019 to 2023 present a comprehensive overview of the scholarly activity surrounding technological innovations in the realms of business and social entrepreneurship. In 2019, the field demonstrated substantial vibrancy with a total of 208 publications, coupled with an impressive citation count of 6771, reflecting a robust engagement within the academic community and a noteworthy impact. Building on this momentum, the year 2020 witnessed a modest increase in the number of publications, totalling 223, with a slight uptick in citations to 6869. This trend indicated a sustained and growing interest in the subject matter, as well as the increasing recognition of the scholarly contributions within the academic discourse. The subsequent year, 2021, marked a significant surge in both publications and citations. With 271 publications, the academic community demonstrated a heightened interest in exploring the intersection of technological innovations, business, and social entrepreneurship. The citation count, reaching 6960, underscored the impactful nature of the research emanating from this thematic domain. However, a noticeable shift in the trajectory was observed in 2022. While the total publications continued to rise, reaching 304, the total citations experienced a decrease to 3357. This divergence may suggest a broadening spectrum of topics or a nuanced shift in research, prompting a closer examination of the evolving trends within the field. The trends in 2023 portray a further expansion in scholarly contributions, with a total of 338 publications. Intriguingly, the total citations witnessed a decrease to 1164, inviting a nuanced exploration of the emerging themes or sub-disciplines shaping the academic narrative within the overarching subject matter. In conclusion, the trends over the specified years delineate a dynamic and evolving landscape in the academic exploration of technological innovations in business and social entrepreneurship. Fluctuations in publication volume and citation counts reveal the field's adaptability and responsiveness to evolving research priorities and emphases during this period.

4.2 PUBLICATIONS BY COUNTRIES

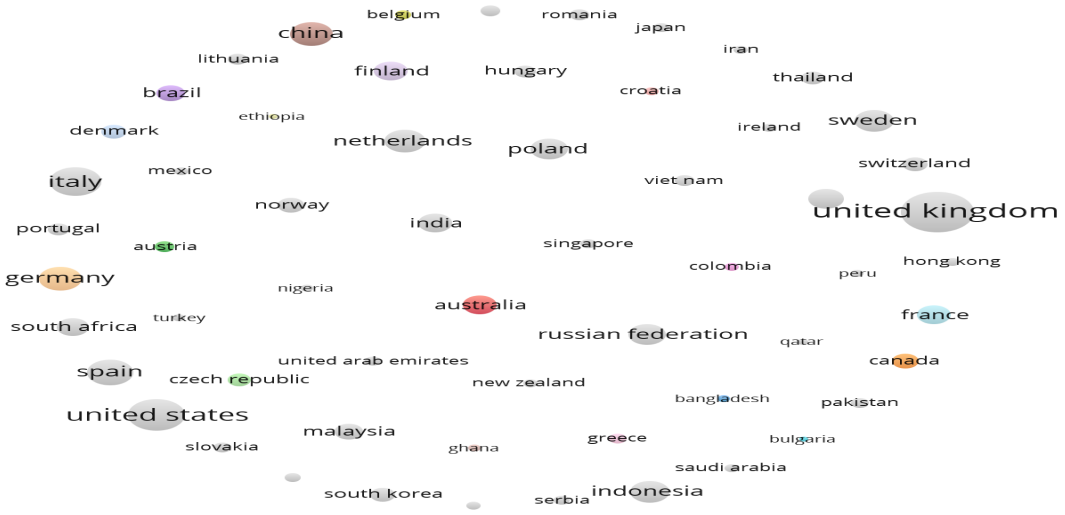

Figure 3. Network visualization map of the countries based on publications.

Figure 3 Analysing publishing patterns over time reveals the geographical distribution of research contributions in the field of technology advances crossing with business and social entrepreneurship. Notably, the United Kingdom emerges as a key player, consistently making significant contributions to the academic discourse in this interdisciplinary domain. Over the examined timeframe, the United Kingdom has consistently led in scholarly output, demonstrating its pivotal role in shaping the academic landscape. This trend suggests a sustained commitment to exploring the multifaceted implications of technological innovations within the realms of business and social entrepreneurship. Furthermore, the global participation in research efforts is evident, with various countries actively contributing to the evolving discourse. The collaborative nature of this research is underscored by the involvement of nations such as the United States, China, Italy, Germany, and Australia. These countries consistently emerge as noteworthy contributors, showcasing a shared commitment to advancing knowledge in this dynamic field. In summary, the publication trends reveal a robust and globally collaborative research landscape. The United Kingdom stands out as a consistent leader, while other nations actively engage in exploring the intricate relationships between technology, business models, and social entrepreneurship. This collective pursuit emphasizes the global relevance and interconnected nature of inquiries into the transformative impact of technological innovations.

4.3 PUBLICATION BY NUMBER OF AUTHORS IN YEARS

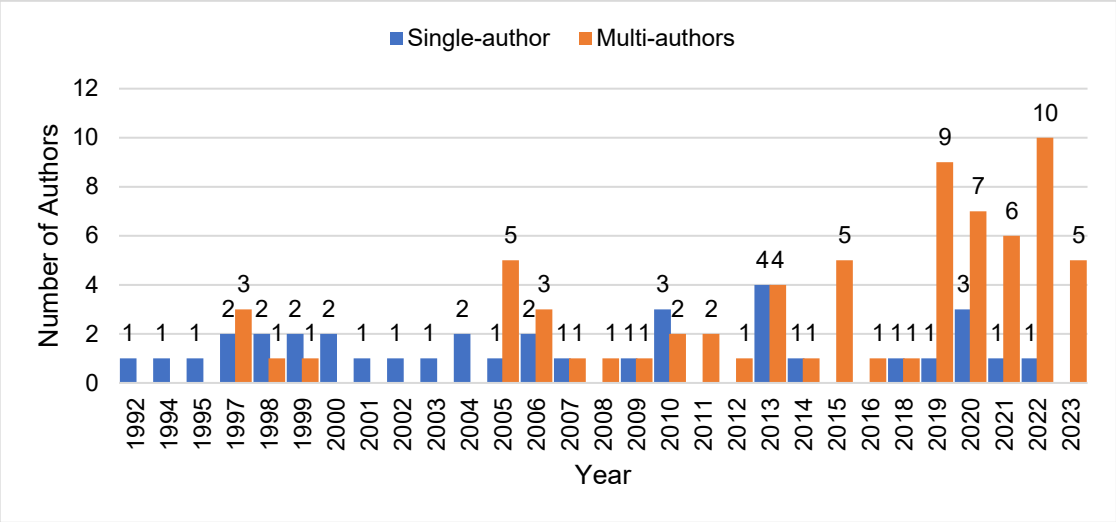

Figure 4. Publication by Number of Authors in Years

Figure 4 analyzing the evolution of publications by the number of authors provides valuable insights into the collaborative nature of research endeavors in the field of technological innovations intersecting with business and social entrepreneurship. The trends across various years showcase the dynamics of authorship patterns and shed light on the changing landscape of collaborative research efforts. In the early years, such as 1992, 1994, 1995, and 1997, most publications featured single authors, highlighting a period when individual contributions were more prevalent. As we progress through the late 1990s and early 2000s, a transition becomes evident, with an increasing number of multi-authored publications. For instance, in 1998, multi-authored works started to gain prominence, comprising three publications. This trend continued into the 2000s, with the number of multi-authored publications steadily rising. Notably, in 2005, there was a significant increase, with five multi-authored publications. The collaborative nature of research continued to grow, reaching a peak in 2015, where a substantial number of publications involved multiple authors, totaling five. The subsequent years, from 2016 to 2023, reflect a consistent presence of multi-authored publications, indicating a sustained trend toward collaborative research efforts. In recent years, particularly in 2019, 2020, and 2022, there has been a notable surge in multi-authored publications, underlining the increasing emphasis on collective knowledge creation. In summary, the historical analysis of authorship patterns underscores the evolving nature of collaborative research in this interdisciplinary domain. The transition from predominantly single-authored publications to an era of increased collaboration reflects the complex and interconnected nature of inquiries into technological innovations, business models, and social entrepreneurship.

4.4 PUBLICATIONS BY SOURCES TITLES AND DOCUMENTS

No.	Author(s)	Title	Source Title	TC	C/Y
1	"Dwivedi Y.K.; Hughes L.; Ismagilova E.; Aarts G.; Coombs C.; Crick T.; Duan Y.; Dwivedi R.; Edwards J.; Eirug A.; Galanos V.; Ilavarasan P.V.; Janssen M.; Jones P.; Kar A.K.; Kizgin H.; Kronemann B.; Lal B.; Lucini B.; Medaglia R.; Le Meunier-FitzHugh K.; Le Meunier-FitzHugh L.C.; Misra S.; Mogaji E.; Sharma S.K.; Singh J.B.; Raghavan V.; Raman R.; Rana N.P.; Samothrakis S.; Spencer J.; Tamilmani K.; Tubadji A.; Walton P.; Williams M.D. (2021)"	Artificial Intelligence (AI): Multifaceted viewpoints on evolving challenges, prospects, and agenda for research, practice, and policy	Global Journal of Information Management	913	228.25
2	"Warner K.S.R.; Wäger M. (2019)"	Constructing dynamic capabilities for digital metamorphosis: A continual process of strategic rejuvenation	Extended-Term Planning	902	150.33
3	"El-Kassar A.-N.; Singh S.K. (2019)"	Sustainable innovation and organizational effectiveness: The impact of extensive data and the moderating function of managerial dedication and human resource practices	Technological Prediction and Social Transformation	559	93.17
4	"Xie X.; Huo J.; Zou H. (2019)"	Eco-friendly process innovation, environmentally conscious product innovation, and corporate fiscal performance: An examination using a content analysis approach.	Journal of Business Research	534	89.00
5	"Büchi G.; Cugno M.; Castagnoli R. (2020)"	Smart manufacturing performance and Industry 4.0	Technological Forecasting and Social Change	397	79.40

Table 1. Top 3 highly cited articles

Table 1. shows the analysis of publications by source titles and associated documents provides a comprehensive overview of significant contributions to the field of technological innovations, business, and social entrepreneurship. One noteworthy publication is "Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy," authored by a group of distinguished scholars led by Dwivedi Y.K. This seminal work, published in the International Journal of Information Management in 2021, has garnered significant attention with a total citation count of 913 and an impressive average of 228.25 citations per year. Similarly, Warner K.S.R. and Wäger M.'s article, "Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal," published in Long Range Planning in 2019, has contributed substantially to the discourse on dynamic capabilities in the context of digital transformation. With a total citation count of 902 and an average of 150.33 citations per year, this publication stands as a key reference in the field. El-Kassar A.-N. and Singh S.K.'s work, "Green innovation and organizational performance: The influence of big data and the moderating role of management commitment and HR practices," published in Technological Forecasting and Social Change in 2019, explores the intersection of green innovation, and organizational performance. This research has garnered 559 citations, averaging 93.17 citations per year, showcasing its impact on literature. Furthermore, Xie X., Huo J., and Zou H.'s article, "Green process innovation, green product innovation, and corporate financial performance: A content analysis method," published in the Journal of Business Research in 2019, delves into the relationship between green innovation and financial performance. With a total citation count of 534 and an average of 89.00 citations per year, this publication has significantly influenced discussions on sustainability and financial outcomes. Büchi G., Cugno M., and Castagnoli R.'s contribution, "Smart factory performance and Industry 4.0," published in Technological Forecasting and Social Change in 2020, explores the

implications of Industry 4.0 on smart factory performance. With 397 total citations and an average of 79.40 citations per year, this work has made a substantial impact on understanding the role of technology in manufacturing evolution. In summary, these selected publications represent pivotal contributions to the field, addressing diverse facets of technological innovations and their implications for business and social entrepreneurship. The citation metrics underline the enduring influence and relevance of these works in shaping academic discourse and guiding future research in this multidisciplinary domain.

Source Title	TP	NCA	NCP	TC	C/P	C/CP	h-index
Quality - Access to Success	6	20	1	4	0.67	4.00	1
Journal of Asian Finance, Economics and Business	4	19	4	110	27.50	27.50	4
Environment, Development and Sustainability	4	18	3	12	3.00	4.00	2
Corporate Governance and Organizational Behavior Review	4	9	2	4	1.00	2.00	1
Resources Policy	2	5	2	41	20.50	20.50	2
Corporate Social Responsibility and Environmental Management	1	4	1	18	18.00	18.00	1
International Food and Agribusiness Management Review	1	4	1	1	1.00	1.00	1

Table 2. Most active source titles.

Table 2. shows several source titles have emerged as highly active contributors to the discourse on technological innovations in the realms of business and social entrepreneurship. One notable publication platform is "Quality - Access to Success," which has published a total of six articles (TP) with the collaboration of 20 contributing authors (NCA). Despite a relatively modest citation count of four, the journal maintains a respectable citations per paper (C/P) ratio of 0.67, demonstrating a consistent impact on its readership. The "Journal of Asian Finance, Economics and Business" stands out with four publications (TP) involving 19 contributing authors (NCA). With a substantial total citation (TC) count of 110, this source title boasts an impressive citation per paper (C/P) ratio of 27.50, indicating a high level of influence in the field. The h-index of 4 further underlines the journal's consistent citation performance. "Environment, Development and Sustainability Corporate Governance and Organizational" is another noteworthy source title with four publications (TP) and 18 contributing authors (NCA). Despite a moderate total citation count of 12, the journal maintains a credible citations per paper (C/P) ratio of 3.00, reflecting a solid impact on its audience. The h-index of 2 further reinforces its scholarly standing. The "Behavior Review" has contributed significantly with four publications (TP) involving nine contributing authors (NCA). While the total citation (TC) count is four, the journal maintains a balanced citations per paper (C/P) ratio of 1.00, signaling a measured influence. The h-index of 1 underscores its contribution to the academic landscape. "Resources Policy" has made a substantial impact with two publications (TP) featuring five contributing authors (NCA). With a total citation (TC) count of 41, the journal exhibits impressive citations per paper (C/P) ratio of 20.50, showcasing its influence in the field. The h-index of 2 further validates its scholarly contribution. "Corporate Social Responsibility and Environmental Management" has made a singular but impactful contribution with one publication involving four contributing authors (NCA). Despite the modest total citation (TC) count of 18, the journal maintains a high citations per paper (C/P) ratio of 18.00, indicating a focused and influential presence. The h-index of 1 underscores its impact. Finally, the "International Food and Agribusiness Management Review" has made a notable contribution with one publication featuring four contributing authors (NCA). Although the total citation (TC) count is one, the journal maintains a balanced citations per paper (C/P) ratio of 1.00, reflecting a measured impact. The h-index of 1 further supports its scholarly contribution. In conclusion, these source titles represent vibrant platforms for the dissemination of research on technological innovations, contributing significantly to the academic dialogue in the domains of business and social entrepreneurship.

4.5 MOST USED KEYWORD

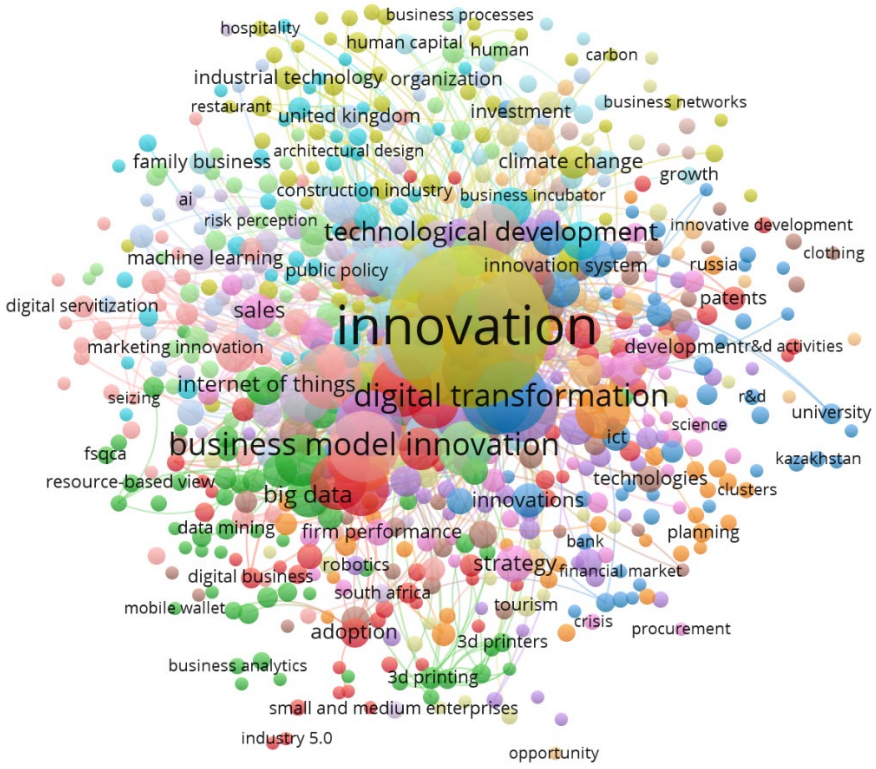

Figure 5. Network visualization map of the co-occurrence based on area of study or keywords.

Figure 5 shows the network visualization map based on the co-occurrence of keywords or areas of study reveals a comprehensive landscape of interconnected themes within the field of technological innovations. With a total of 721 items clustered into 17 distinct groups, the visualization provides insights into the key focal points and their interrelations. The most prominent theme in the network is "innovation," representing Cluster 4. This cluster demonstrates a robust presence with 597 links, a total link strength of 2156, and a high occurrence rate of 397. The centrality of innovation signifies its overarching importance in the discourse on technological advancements. The second significant theme is "digital transformation," encapsulated in Cluster 3. With 228 links, a total link strength of 445, and 81 occurrences, this cluster underscores the growing emphasis on digital transformation as a pivotal aspect of technological evolution. Closely following is the theme of "business model innovation" within Cluster 10. This cluster exhibits 226 links, a total link strength of 443, and 77 occurrences, emphasizing the interplay between technological advancements and the innovative restructuring of business models. Another noteworthy theme is "technological advancement," situated in Cluster 17. With 222 links, a total link strength of 416, and 46 occurrences, this cluster reflects the collective exploration of the latest technological developments and their implications. The theme of "business development" in Cluster 12 follows closely, featuring 237 links, a total link strength of 475, and 43 occurrences. This cluster highlights the integral relationship between technological innovations and the strategic evolution of businesses. In summary, the co-occurrence network visualization map provides a nuanced understanding of the thematic landscape, with "innovation" serving as the central node and interconnected clusters delving into various facets such as digital transformation, business model innovation, technological advancement, and business development. This intricate web of themes signifies the multidimensional nature of discussions surrounding technological innovations in the academic domain.

5. CONCLUSION

In conclusion, the bibliometric analysis undertaken on the topic of technological innovations in the spheres of business and social entrepreneurship provides a comprehensive and insightful overview of the scholarly landscape. The analysis, conducted with data extracted from Scopus and employing keywords such as "technology," "innovation," and "business," offers valuable insights into the trends, publication patterns, and influential sources within this domain. The analysis spans several years, revealing a steady increase in publications, from 208 in 2019 to 338 in 2023. This growth signifies

the sustained interest and relevance of the topic, reflecting the dynamic nature of technological innovations in business and social entrepreneurship. Geographically, the United Kingdom emerges as a leading contributor to publications, showcasing its active engagement in exploring and disseminating knowledge in this field. Additionally, the collaboration of authors from various countries underscores the global nature of research on technological innovations. The examination of publication trends by the number of authors indicates a shift towards collaborative efforts in recent years, with an increasing number of multi-authored papers. This collaborative approach aligns with the interdisciplinary and multifaceted nature of technological innovations, where diverse expertise converges to address complex challenges. Key publications, such as those in the "International Journal of Information Management" and "Long Range Planning," demonstrate the scholarly impact of certain articles. These influential sources contribute significantly to academic discourse, fostering a deeper understanding of emerging challenges, opportunities, and research agendas in the realm of technological innovations. The network visualization map further elucidates the thematic landscape, highlighting the centrality of "innovation" and its interconnectedness with pivotal themes like digital transformation, business model innovation, technological advancement, and business development. In essence, this bibliometric analysis serves as a valuable resource for researchers, policymakers, and practitioners, offering a structured overview of the evolving trends, key contributors, and thematic interrelations within the dynamic field of technological innovations in business and social entrepreneurship. As the technological landscape continues to evolve, this analysis provides a foundation for future exploration and inquiry into the multifaceted dimensions of innovation in various sectors.

CONFLICT OF INTERESTS

None.

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