



Towards a comprehensive analytical framework and future research agenda for research on sharing economy business models: thematic analyses approach

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Abstract

The sharing economy is considered to be an important pathway for economic growth, increasing employment and household income, and the transition toward sustainability in the twenty-first century. In spite of the widespread use of the sharing economy concept, the understanding varies, and there is disagreement about what constitutes an analytical framework of the sharing economy business model (SEBM). This research quantitatively analyzes and categorizes the fundamental elements of the current SEBM literature. A comprehensive analytical framework is presented, identifying three distinct segments of SEBM: (1) the knowledge of sharing economy (incl. innovation, new technologies, determinants, and ecosystems); (2) supplier-oriented studies (incl. hospitality-oriented, transportation-oriented, and other platforms and models); and (3) consumer-socioeconomic-sustainability-focused research (incl. consumption and customer satisfaction, collaborative consumption, sustainability, social effects, and economic growth). In addition to contributing to a better understanding of SEBM research, the framework has implications for SEBM development policy and practice. It can also be used as an instrument for evaluating business models. Furthermore, the paper identifies six key research directions for the post-COVID-19 era, covering the studies of determinants and ecosystems, emerging economies, new SEBMs, location- and culture-specific models, sustainability, and combined impacts on socioeconomics.

Keywords Sharing economy business models · Bibliometric analysis · Post-COVID-19 era · Research directions

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1 Introduction

The sharing economy facilitates the exchange of existing products and assets, creating opportunities and challenges for service providers to design or modify their business models. Known as sharing economy business models (SEBMs) (Kumar et al. 2018), these enable firms to generate and capture value in a systematic manner (Acquier et al. 2019; Duan 2023a, b). Also, networked communities are established in a way that allows resources to be shared, acquired, and exploited collectively without requiring ownership. On this basis, asset owners and users (individuals and companies) can generate economic value from underutilized assets (Zervas et al. 2017; Belk 2014). The emergence of new SEBMs such as Uber, Lyft, DiDi, and Airbnb has disrupted traditional modes of operation across a wide range of industries, and has led to innovative business models which facilitate cross-sector collaboration (Filser et al. 2020).

Changing socioeconomic-environmental conditions, as well as the growing interest in the sharing economy, have made it increasingly necessary to analyze not only the market needs, but also how the recent development of SEBMs can contribute to social, economic, and environmental sustainability (Kraus et al. 2020; Netter et al. 2019). Thus, analytical or conceptual (used interchangeably hereafter) framework research should be conducted continuously and in a timely manner to reflect the most recent developments (Snyder 2019). As Belk (2014) pointed out, analytical framework research is an important step between describing a new sharing economy phenomenon and developing theories to explain and predict it (e.g., the impact of local context on SEBM stakeholder value creation efforts) as the research field progresses through the research cycle.

The sharing economy has witnessed growth (though the significance of this growth is often disputed) as a new business practice (Kraus et al. 2020). The sharing economy is described by Belk (2014) and Zervas et al. (2017) as a socioeconomic system in which asset owners and users (individuals or corporations) share access to products or services associated with these assets. The sharing economy emerged in the 1990s as new technologies were developed, particularly the Internet, which enabled the exchange of information and the facilitation of online transactions. The rapid development of the Internet, cloud computing, blockchain technology, social media, and e-commerce platforms within the business world over the past three decades has resulted in significant changes in people's lives, and enabled economic sharing of both goods and services based on the concept of "what's mine is yours" (Richter et al. 2017). Globally, perceptions of the sharing economy have changed substantially (Cohen and Kietzmann 2014); it is now recognized as one of the most important pathways for economic growth and increased employment and household income (Cohen and Kietzmann 2014).

In terms of academic research, the sharing economy has steadily gained attention in recent years (Cheng 2016; Cohen and Kietzmann 2014; Kraus et al. 2020). The field has been exponentially expanding geographically and disciplinarily (Kraus et al. 2020); from 2014 to 2019, the number of research articles published in accredited journals increased by 30% (Netto and Tello-Gamarra 2020), and the

number of citations increased by 55% (Kraus et al. 2020). Consequently, Filser et al. (2020) reported that despite the fact that the sharing economy is still a new area of research, the number of publications and citations has steadily increased over the past few years.

These studies have, in some way, highlighted the importance of the research of SEBMs (Curtis 2021; Richter et al. 2017), a major component of the sharing economy, supported by information and communication technologies and Web 2.0 (Richter et al. 2017; Yin 2022). As Yin (2022) pointed out, new business models are essential for the future advancement of the sharing economy. Scholars believe that SEBMs have played a critical role in sharing economy; however, this role has not yet been adequately explored (Schwing et al. 2022; Yin 2022). There has been calls for knowledge mapping the SEBM area, synthesizing the latest analytical framework, and identifying avenues for additional research attention in light of the fast-growing number of new models (Agarwal and Steinmetz 2019; Kraus et al. 2020). Due to the inconsistent reports regarding the positive and negative effects of COVID-19 on the sharing economy, this SEBM research is of particular importance (Liu et al. 2022).

Furthermore, despite the increasing attention paid to it, researchers do not seem to have a common understanding of how the SEBM analytical framework is formed (Bouncken et al. 2021; Kraus et al. 2020; Yin 2022). New SEBMs with various objectives, such as sustainable development and inclusive renovation, are proliferating in practice and research (Wang et al. 2022; Yang and Yao 2022). Thus, a timely knowledge structure review of the literature is required for evaluating and updating the latest analytical and analytical frameworks. Furthermore, despite the fact that a number of literature review studies have been conducted within the SEBM subfield to synthesize the development of a specific type of SEBMs (Agarwal and Steinmetz 2019; Akhmedova et al. 2020; Duan 2023a), there are currently no review studies that comprehensively examine the entire SEBM area and aim to establish a comprehensive analytical framework and forecast future research directions.

This study aims to fill the abovementioned gaps by systematizing the scientific achievements related to SEBMs, thus providing a holistic overview of the currently fragmented literature and proposing a current research framework and future research agenda. The objectives of this analytics study are to (1) detect and visualize the research themes/clusters of all published articles up to 2022 from perspectives of biographic coupling, analytical structure, and intellectual structure of the SEBM field, (2) reveal the emerging trends that each thematic cluster represents and the strategic principles they embody, and (3) explore future research directions. With these in mind, an analytics approach of systematic literature review was conducted to answer the following research questions:

RQ1. From a bibliographic analysis perspective, which themes/clusters exist in the SEBM research and can be detected in the current publications through article coupling analysis? The answer will unearth the co-citation networks in SEBM research from the perspective of all articles in the literature.

RQ2. From a bibliographic analysis perspective, which themes/clusters exist in SEBM research and can be detected in the current publications through author cou-

pling analysis? The answer will unearth the co-citation networks in SEBM research from the perspective of all authors in the literature.

RQ3. From an analytical structure perspective, which themes/clusters exist in SEBM research and can be detected in the current publications through keyword co-occurrence network analysis? The answer will construct keyword networks representing weighted themes in the literature.

RQ4. From an analytical structure perspective, which themes/clusters exist in SEBM research and can be detected in the current publications through factorial analysis of author keywords? The answer will construct clusters representing weighted keyword clusters in the literature.

RQ5. From an intellectual structure perspective, which themes/clusters exist in SEBM research and can be detected in the current publications through co-citation analysis? The answer will construct clusters representing weighted co-citation networks in the literature.

RQ6. What do the research themes/clusters detected from RQs 1 to 5 imply for a comprehensive analytical SEBM research framework? The answer will inform the development of a comprehensive analytical framework for SEBM research.

RQ7. What do the research themes/clusters detected from RQs 1 to 5 and the analytical framework generated from RQ6 imply for future research directions? The answer will establish future directions for SEBM research, particularly in the post-COVID-19 era.

Since all these research questions have not been previously addressed, the findings from this study will contribute new knowledge to SEBM literature. To the author's best knowledge, the methodology of using five thematic analyses in one study to holistically analyse the literature from various perspectives is the first of its kind. The proposed analytical FRAMEWORK will be holistic and comprehensive since it considers all metadata and their interrelationships for the entire dataset retrieved from databases. By employing this unique methodology and using the findings to develop an analytical framework, the future research agenda will be more precise, practical, and achievable.

This paper begins with a brief explanation of analytics and its use in sharing economy research before proceeding to outline the methodology, including the data collection process, dataset description, and measures used in the research. Comprehensive results for biographic coupling (articles and authors) along with analytical and intellectual structure analyses (author keyword co-occurrence, word-map, co-citations) are then presented. After that, a comprehensive analytical framework and future research directions for SEBM research are put forward. This is followed by a discussion of the theoretical and practical implications of the study and a concluding summary.

2 Research background

The sharing economy is currently surrounded by controversy to the point that it is unclear if it is in fact a specific phenomenon- even though SEBMs are widely used to describe sharing economy phenomena (Ritter and Schanz 2019). An SEBM

reveals the economic logic behind a specific sharing service (including the provider, the consumer, and the ecosystem). It explains how resources and capabilities will be converted into economic value through the sharing of services. Sharing economy service providers develop their business models based on existing business models and working templates. Consequently, SEBMs are constantly under innovation pressure from competitors who are seeking to successfully copy business models in a rapidly changing environment. Business model innovation implies reconfiguring its elements, including the content (activities), the structure (linkages of activities), and the governance (who engages in activities). By leveraging SEBM innovation, sharing economy stakeholders can transform how they connect with their stakeholders, engage in economic exchange, and create value for all parties.

The purpose of proposing analytical frameworks is to provide tools for descriptive analysis, forecasting, and planning, or to demonstrate communications within business models, and so on. In the field of research, literature reviews are widely used to identify analytical frameworks, such as themes, patterns, processes, and outcomes (Kraus et al. 2020). In the same manner, qualitative systematic literature reviews have been employed to identify research trends related to the sharing economy phenomenon (Agarwal and Steinmetz 2019; Cheng 2016). It is only recently that systematic literature reviews have been incorporated into the development of analytical frameworks for field research across disciplines, specifically in multidisciplinary or interdisciplinary research (Snyder 2019). Snyder (2019, p333) further pointed out, “[a] review is an excellent way of synthesizing research findings to show evidence on a meta-level and to uncover areas in which more research is needed, which is a critical component of creating theoretical frameworks and building analytical models.” He reiterated that systematic literature reviews have the potential to “address research questions with a power that no single study has.” Since there is a lack of analytical framework studies in the area of SEBMs, this section reviews the selected method of bibliometric analysis applied in the research of the sharing economy field. Bibliometric analysis, which originated in the field of information science, is concerned with quantifying what has already been published and evaluating the evolution of topics and fields that are related. In addition to revealing the macro and meso structures of scientific creation and its application, bibliometrics can provide insight into the development history of a specific area of research, current trends in research, and future directions (Klarin and Suseno 2021). There is widespread consensus that articles, authors, citations, co-citations, coauthorships, affiliations, countries, and journals comprise the basic items of bibliometric analysis, as well as their interrelationships (Filser et al. 2020; Kraus et al. 2020). According to Caniato et al. (2019), a bibliometric analysis can produce descriptive, predictive, and prescriptive results (Caniato et al. 2019).

The purpose of descriptive-analytical is to provide a static overview of the state-of-the-art of a specific research topic based on the current data collection. The results provide an answer to questions such as “What happened?” as well as “What is happening?” The use of descriptive analytics can provide a starting point for exploring generic or specific issues, as well as the development of purposefully formulated innovative questions. Thus, bibliometric analysis is not limited to a static description of the disciplinary text; it can suggest a more dynamic and forward-looking

approach. The state-of-the-art questions in this study include “what themes/clusters are present in current SEBM research?” from the perspectives of article coupling, author coupling, co-occurrence of author keywords, and co-citations. These themes contribute to the development of an analytical framework for SEBM research, which contributes to the literature on sharing economies.

In predictive analyses, bibliometric analyses provide estimations of the future state by utilizing forecasting and simulation techniques to answer the questions of “what will happen?” and “why will it happen?”. As part of these estimates, it is important to understand the most current conversations in the field, as well as field evolution, valuations, and optimal research themes, sometimes by analyzing content. Research in this study examines the potential for combining dominant themes and keywords in SEBM research to predict future research directions after COVID-19.

With the use of simulations and optimization, bibliometric analysis can be used for prescriptive analytics in order to address questions such as “what should we do?” and “why should we do it?” This type of analytics is suitable for exploring SEBM research in order to forecast the future directions of the field. The results of this study will demonstrate that analytics can be useful for identifying the themes or combinations of themes that will be most effective for generating a analytical framework and forecasting future research agenda by categorizing themes into niche, motor, emerging, and basic areas of research.

Furthermore, the bibliometric analysis provides information on the evolution of author keywords, authors, as well as collaboration based on the historiographic and thematic dynamics of the field. In light of this information, Duan (2023a) explains that bibliometrics is aimed at quantifying, describing, and predicting the scientific conversation process based on the characteristics of publications. The study of conversation patterns over time provides insight into the behavior models and academic patterns that have evolved within a particular field. Therefore, bibliometric studies serve research by providing guidance on emerging themes when they have not yet been consolidated within the academic-scientific community.

Performance analyses can be conducted using bibliometric analysis, which focuses on the productivity and impact of field publications. A hybrid review conducted by Ahmedova et al. (2021) identified research themes, theoretical frameworks, relevant contexts, and methods regarding service quality in the sharing economy by combining bibliometric analysis with the antecedents, decisions, and outcomes (ADO) framework. Based on the results, the sharing economy can be classified into four quadrants: quality is not a priority and is not specified; quality is not a priority but is specified; quality is a priority; quality has online and offline dimensions, and quality is a priority that is specified based on the quality of websites, platforms, and services offered by peers (Akhmedova et al. 2020). Most commonly, this category of application is used to answer the question of “what we are researching” (da Silveira et al. 2016; Duan 2023b; Yang and Xia 2021).

Bibliometrics can also be employed to focus on scientometric mapping, which investigates themes within a specific research area by engaging in citation analysis, co-citation analysis, bibliometric coupling, co-keyword and coauthorship analyses. Kraus et al. (2020) identified four clusters of existing research through co-citation analysis: freelance work and its implications; transportation and solutions for the

sustainable development of the sharing economy; user experience and collaborative consumption; and the sharing economy in the context of hospitality and tourism. This category of application can be employed to forecast research directions through thematic mapping, thematic evolution factor analysis, and other enrichment technologies.

Some studies have focused on a specific SEBM, such as asset-sharing, peer-to-peer business models, crowdsourcing, access-based consumption, and communities, while others have focused on specific platforms (e.g., Airbnb, Uber). Silva and Moreira (2022) analyzed bibliometric data for 506 articles published between 1991 and May 2021 in Scopus and Web of Science (WOS). According to them, sharing economy (platform) developers play a vital role in establishing strategies and policies, as well as taking actions to achieve social welfare through entrepreneurship. Kraus et al. (2020) examined research patterns in the sharing economy by collecting publications from the WOS core collection between January 2013 and February 2020. Their research identified six clusters in the literature on the sharing economy: (1) products liability, (2) organizing framework, (3) profile characteristics, (4) diverse economies, (5) consumption systems, and (6) everyday life. In an article utilizing a hybrid method, concurrent themes were identified (Trabucchi et al. 2019). There were five main themes that emerged: consumer motivations, impact on society, market and policy, business model and revenue model, and definition or framework. Furthermore, a analytical study has been developed in the form of a business model framework based on a qualitative literature review (Ritter and Schanz 2019). Despite SEBMs playing an important role in the sharing economy revolution (Kumar et al. 2018; Wang 2022), no quantitative bibliometric studies have been conducted to establish an analytical framework.

3 Methodology

Bibliometric analysis is an effective tool for assessing a field's intellectual structure and emerging trends when the scope of the review is broad and the dataset is too large for manual review (Donthu et al. 2021). The use of this approach has grown exponentially in business and management disciplines over the past 20 years and has contributed to the creation of new knowledge in the literature (Donthu et al. 2021). Bibliometric analysis is also suitable for multidisciplinary, multi-theoretical, and multi-methodological studies. In this study, bibliometric analysis is used to quantitatively review the state of the research in the field of business models in the sharing economy. In this section, we describe the research design, the collection and description of data, and the measurement used in the result analysis.

4 Research design

As an approach to systematic reviews, bibliometric analysis has been applied to create analytical frameworks that significantly contribute to various fields (Keathley-Herring et al. 2016; Šímová 2023). Scholars (Donthu et al. 2021; Keathley-Herring

et al. 2016) believe that analytical frameworks derived from scientometric factors are used to develop generalized maturity analytics that establishes comprehensive criteria for field assessment and research agenda development. Bibliometric and content analyses were combined in this study following Paul et al.'s (2021) suggestion that a hybrid approach that incorporates systematic literature review and content analysis will be more rigorous and informative. Compared to systematic reviews in other areas, this study employs multi-clustering technologies to complementarily detect research themes existing in the current SEBM literature, rather than a single mechanism. The results of this study clearly demonstrate that the use of multi-clustering technologies is an effective method for exploring analytical frameworks and thematic studies.

The five objectives of this study are achieved through five steps (Fig. 1). In order to conduct database searches, a series of keywords was defined following the establishment of the research aim, target, and strategy. In order to enhance the dataset and avoid missing any articles, two commonly used databases were chosen (Scopus and WoS). The final dataset was created by merging two outputs into one and removing duplicates. For data analysis (performance and science mapping), Bibliometrix R was used, a highly recommended visualization tool (Donthu et al. 2021). Afterward, this paper was drafted as the final report.

4.1 Dataset collection and description

The WoS Core Collection is one of the world's leading citation databases. In addition to articles from the most highly regarded journals around the world, the database also contains conference proceedings and books. There is coverage of some titles dating back to 1900. Elsevier's Scopus database contains abstracts and citations of peer-reviewed papers published in scientific journals, books, and conference proceedings (Duan 2023a, b). On 15 September 2022, database queries were conducted. Only duplicate articles and articles in other languages were removed from Endnote.

The search string used was ("shared economy" or "sharing economy") and ("business model" or "business models"). As a result of the searches, 705 and 642 records were returned from WoS and Scopus, respectively. After removing duplicate

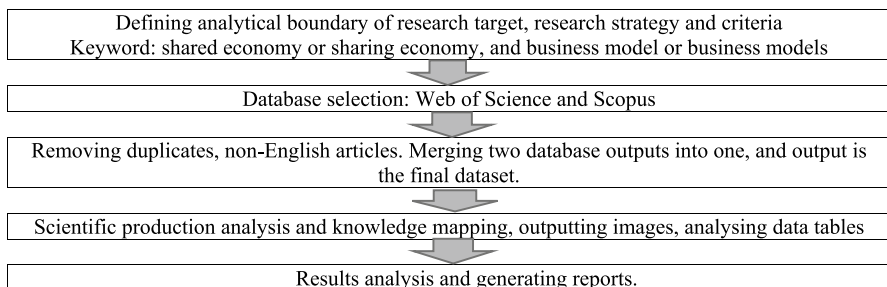


Fig. 1 Research Process

entries, 951 entries were left from 552 sources for the final dataset. The dataset contained a total of 2059 authors (Table 1). The dataset covered the period between 2014 and 2022. A significant number of sources (552 articles) have published articles on SEBMs, as shown in Table 1. Detailed analysis revealed that these 552 sources included 144 conference proceedings, 12 books, 57 book chapters, 8 editorials, and each of these records was treated as a separate source. All retrieved publications were taken into account in order to present a comprehensive picture of SEBM research.

4.2 Metric measures and descriptions

A performance analysis examines the contributions made by different elements of research to a given field. For analysis of field production, a number of measures are available, the most important of which are the number of publications, productivity metrics, and citations per year or per research component. In addition to citations per publication, other measures such as h-index are used to measure research performance based on both citations and publications. The study adopted several key terms (Table 2) from previous studies (Duan 2023a) for use in various positions of the paper to assess the performance of research constituents. The performance metrics are categorized into three categories: publication-related, citation-related, and combined publication-related and citation-related performance metrics.

Knowledge mapping examines the relationships between research elements. The purpose of this analysis is to examine the interaction between research elements and their structural relationships. Some of the techniques that are used for knowledge mapping include analysis of citations and co-citations, coupling of bibliographic records (authors and articles), analysis of co-words, and analysis of coauthorship. The combination of such techniques with network analysis facilitates the

Table 1 Description of the collected dataset (Established at 15 September 2022)

Description	Results	Description	Results
Timespan	2014:2022	Article	555
Sources (Journals, Books, etc.)	552	Article; Book Chapter	1
Documents	951	Article; Early Access	30
Annual growth rate %	50.98	Article; Proceedings Paper	4
Document average age	2.64	Book	12
Average citations per doc	13.84	Book Chapter	57
References	38,167	Conference Paper	86
Keywords plus (ID)	1639	Conference Review	2
Author's keywords (DE)	2371	Editorial Material	8
Authors	2059	Meeting Abstract	1
Authors of single-authored docs	153	Proceedings Paper	144
Single-authored docs	166	Review	49
Co-Authors per Doc	2.76	Review; Early Access	2
International co-authorships %	21.77		

Table 2 Key terms used in this analysis (adopted from Donthu et al. 2021 and Duan 2023a)

Metric	Description	Metric	Description
<i>Publication-related metrics</i>			
Keywords Plus	A metric provided by the bibliophilic package based on words or phrases that frequently appear in the titles of an article's references and author keywords	Number of cited publications (NCP)	Number of publications of research constituent that are cited
Author keywords	Are chosen by authors to best reflect the content of articles	Citations per cited publication (CCP)	TC for NCP
Total publications (TP)	Total publication of research constituent	Global citation (GC)	Number of citations in a paper
Number of contributing authors (NCA)	Total number of authors contributing to publications of research constituent	The local citation (LC)	Number of citations in a paper in a reference list to other papers within the collected dataset
Sole-authored publications (SA)	Total number of sole-authored publications by research constituent	Total citations (TC)	Total citations of research constituent
Co-authored publications (CA)	Total number of co-authored publications by research constituent	Average citations (AC)	Average citations (e.g., per publication, per year, per period) of research constituent

Metrics can be computed for each research constituent (e.g., authors, institutions, countries, journals) as aggregates (e.g., research constituent) or in specifics (e.g., research constituent per publication, per year, or per period) depending on information needs (e.g., aggregates for overviews, specifics for trends observation)

presentation of the bibliometric structure as well as the intellectual structure of the research field (Donthu et al. 2021). It is important to consider both citations and publications when assessing the performance of research constituents. As part of this study, science mapping metrics (Table 3) were adopted from previous studies (Donthu et al. 2021; Duan 2023a, b) to assess the knowledge structure of SEBM research, which includes bibliographic coupling (article and author), analytical structure (keyword cooccurrence, and keyword map), and intellectual structure (co-citation analysis).

For thematic classification, network metrics are used to improve the quality of the bibliometric analysis. A network metric is particularly useful for explaining the relative importance of research components, such as keywords or a set of keywords. It is important to note that network metrics are frequently used in bibliometric studies in order to enrich the conversation between research subjects, and thus, they represent a legitimate method for improving the accuracy of bibliometric assessments. This study analyzed several network metrics (e.g., degree of centrality, betweenness, degree of impact, centrality, and PageRank), as well as a table of the most frequently cited publications. Table 4 provides a list of important terms and their descriptions.

5 Results

5.1 Clustering by bibliographic coupling

This section answers the first two research questions (RQ1 and RQ2, in introduction section) by bibliographic coupling of articles and authors. The bibliographic coupling process detects and presents the number of heterogeneous clusters in studies published in the SEBM area.

5.1.1 Bibliographic article coupling

Article coupling, studies that share at least one cited reference, was employed to analyse the relationship between the research context and knowledge structure underlying the publications. The more shared citations two publications contain, the stronger the bibliographic coupling between them is; the measure indicates a similarity between the themes and knowledge. Coupling analysis helps to find out the closest research works, group them into clusters, and build a bibliometric network based on the strength of the connections between them.

The thematic map in Fig. 2 shows the main themes detected in the study of SEBMs in the period under analysis, categorising them into five clusters according to centrality and density. Each theme is associated with a sphere and a label. The labels were chosen by selecting the most central keywords of their associated theme networks. The size of the spheres represents the number of articles or authors associated with the theme. The five clusters of keyword combinations are as follows: “sharing economy-satisfaction-consumption”, “innovation-sharing economy-consumption”, “consumption-business models-sharing economy”, “business models-collaborative consumption-framework”, and “innovation-consumption-pathway”.

Table 3 Techniques for science mapping and their usage, unit of analysis, and data (adopted from Duan 2023a)

Technique	Usage	Unit of analysis	Data requirements
Citation analysis	To analyze the relationships among publications by identifying the most influential publications in a research field	Documents	Author name Citations Title Journals DOI References
Co-citation analysis	To analyze the relationships among cited publications to understand the development of the foundational themes in a research field	Documents	References
Bibliographic coupling	To analyze the relationships among citing publications to understand the periodical or present development of themes in a research field	Documents	Author name Title Journals DOI References
Keywords co-occurrence analysis	To explore the existing or future relationships among themes in a research field by focusing on the written content of the publication itself	Words	Title Abstract Author keywords Index keywords Full text
Coauthorship analysis	To examine the social interactions or relationships among authors and their affiliations and equivalent impacts on the development of the research field	Authors Affiliations	Author Affiliation (institution and country)

Table 4 Terms and descriptions for theme metrics

Terms	Description	Reference
<i>Degree of centrality</i>	Refers to the number of relational ties a research constituent has in a network	Donthu et al. (2021)
<i>Closeness centrality</i>	Refers to the capability of nodes to carry information effectively by being closer to other nodes in the network. The sum of distance of such nodes from other nodes in the network. It is how close a node is to all other nodes in the network	Donthu et al. (2021), Sharma et al. (2018), Duan (2023a, b)
<i>PageRank</i>	Is an alternative measure of a publication's impact	Donthu et al. (2021)
<i>Betweenness centrality</i>	Refers to a node's ability to carry information between unconnected groups of nodes, wherein each node represents a research constituent. Or how often a node (vertex) is located on the shortest path (geodesic) between other nodes	Donthu et al. (2021), Sharma et al. (2018)
<i>Eigenvector centrality</i>	Is higher for nodes that are connected to other highly connected nodes, wherein each node represents a research constituent	Donthu et al., (2021)
<i>Impact</i>	Refers to the frequency of use by the articles in the dataset in coupling analysis	Sharma et al. (2018), Sharma et al. (2018), Duan (2023a, b)

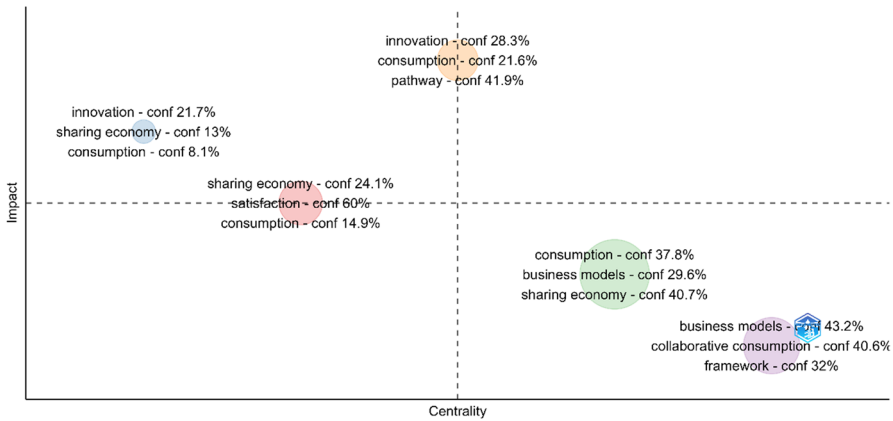


Fig. 2 Clustering results of article coupling (the size of each sphere is relative to the number of articles contained in the cluster)

Table 5 provides detailed characteristics for each cluster. Clusters one to five comprise 43, 26, 82, 59, and 40 articles, respectively.

The position of each sphere was then defined according to Callon’s (1991) centrality and density measurements. Centrality measures the intensity of connections with other clusters for a given cluster. The stronger these links are, the more this cluster represents a set of research problems considered crucial by the scientific community.

Centrality can be considered as the importance of the theme in the entire area of investigation. In turn, the impact dimension refers to the frequency of use by the articles in the dataset. Displayed in Fig. 2, centrality and impact can be read as a measure of a theme’s development: (1) the upper-right quadrant shows the main themes, (2) the lower right shows the basic themes, (3) the lower left shows the emerging or declining research themes, and (4) the upper left indicates very specialized or niche themes.

Table 5 also shows the centrality and impact of each cluster in SEBM development. The ranked impact order by labels (second column) is “pathway”, “innovation”, “satisfaction”, “consumption”, and “collaborative consumption”. The first two, which appear on the upper half of Fig. 2, have a stronger impact on the area than the other three. The ranked centrality order is “collaborative consumption”, “consumption”, “pathway”, “satisfaction”, and “innovation”. Therefore, the first two clusters have a stronger relationship with the SEBM area. Based on the confidence level of each component within each cluster, all five clusters can be interpreted as “satisfaction-centered consumption”, “innovation centered consumption”, “sharing economy centered consumption”, “framework centered collaborative consumption”, and “pathway innovation for consumption”. Thus, the crucial word from author coupling is consumption.

Based on the results displayed in Fig. 2 and Table 5, these five clusters demonstrate that the articles in the SEBM area have focused mostly on issues related to (1) consumption satisfaction, (2) innovation for consumption sharing economy,

Table 5 Clustering results of article coupling

Cluster	Label	Description	Articles (No)	Centrality	Impact
1	Satisfaction	Sharing Economy—Conf 24.1% Satisfaction—Conf 60% Consumption—Conf 14.9%	43	0.3507	3.9446
2	Innovation	Innovation—Conf 21.7% Sharing Economy—Conf 13% Consumption—Conf 8.1%	26	0.2794	4.4035
3	Consumption	Consumption—Conf 37.8% Business Models—Conf 29.6% Sharing Economy—Conf 40.7%	82	0.3937	3.9420
4	Collaborative Consumption	Business Models—Conf 43.2% Collaborative Consumption—Conf 40.6% Framework—Conf 32%	59	0.5095	3.5531
5	Pathway	Innovation—Conf 28.3% Consumption—Conf 21.6% Pathway—Conf 41.9%	40	0.3827	4.4694

(3) consumption sharing economy, (4) collaborative consumption framework and business models, and (5) innovative pathways for consumption. Therefore, it can be concluded that SEBM studies have concentrated on “consumption,” including “collective consumption”. Comparing these five clusters, “pathway”, “satisfaction”, and “innovation” have a stronger impact on the area than “consumption” and “collective consumption.” But the latter two are basic themes that have a strong relationship with, and are important to, the other three. The satisfaction cluster is an emerging theme since it is partially positioned in the lower-left quadrant.

5.1.2 Bibliographic author coupling

Author coupling refers to the phenomenon of two authors citing the same article(s) in articles that these two authors have published. The more shared citations the two authors have, the stronger the author coupling between them; the measure also indicates a similarity between the themes and knowledge. As with article coupling, author coupling assists in building a bibliometric network based on the strength of connections.

Figure 3 shows the author coupling results—nine clusters. They are the keyword combinations of “collaborative consumption-sharing economy-satisfaction”, “sharing economy-trust-Airbnb”, “innovation-impacts-future”, “innovation-consumption-sustainability”, “accommodation-cities-urban”, “business models-collaborative consumption-consumption”, “business models-innovation-management”, “innovation-consumption-business models”, “sharing economy-Airbnb-business model innovation”. They are labeled as “satisfaction”, “Airbnb”, “impact”, “sustainability”, “urban”, “collaborative consumption”, “management”, “innovation”, and “business model innovation” in Table 6, which provides detailed characteristics for each cluster. Table 6 shows cluster one to nine comprise 25, 9, 13, 22, 10, 89, 32, 36 and 4 articles, respectively.

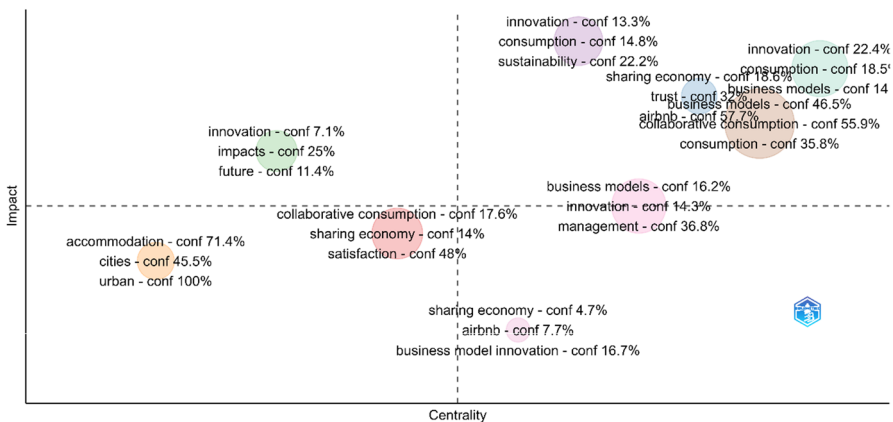


Fig. 3 Clustering results of author coupling

Table 6 also shows the clusters' centrality and impact in SEBM development. The ranked impact order by labels is "sustainability", "innovation", "Airbnb", "collaborative consumption", "impact", "management", "satisfaction", "urban", and "business model innovation". The five clusters on the upper half of Fig. 3 have a stronger impact on the SEBM area than the other three positioned on the lower half. The ranked centrality order is "innovation", "collaborative consumption", "Airbnb", "management", "sustainability", "satisfaction", "impact", "urban", and "business model innovation". The six clusters on the right side of Fig. 3 have a stronger relationship with the area of SEBMs than the three on the left.

These nine clusters (Table 6) demonstrate that SEBM researchers have focused mostly on issues related to the combination of (1) collaborative consumption-sharing economy-satisfaction, (2) sharing economy-trust-Airbnb, (3) innovation-impacts-future, (4) innovation-consumption-sustainability, (5) accommodation-cities-urban, (6) business models-collaborative consumption-consumption, (7) business models-innovation-management, (8) innovation-consumption-business models, (9) sharing economy-Airbnb-business model innovation. Therefore, it can be concluded that authors have concentrated on "satisfaction", "Airbnb", "impact", "sustainability", "urban", "collaborative consumption", "management", and "innovation" on the grounds that these keywords have the highest confidence within each cluster.

Comparing these nine clusters, "sustainability" (impact measure is 3.6749), "innovation" (3.1483), "Airbnb" (3.0289), and "collaborative consumption" (2.7746) have significantly impacted the area. On the other hand, "business model innovation" (0.000) has had no impact on the field. Others, "management" (1.9085), "urban" (1.2896), "impact" (2.3660), and "satisfaction" (1.6798) have had a moderate impact on the field so far, while "urban" and "satisfaction" clusters are recognized as emerging themes, as they are positioned in the lower-left quadrant of Fig. 3.

5.2 Analytical structure

The analytical structure analysis answers research questions three and four (RQ3 and RQ4, in introduction section) through network analysis and factorial analysis of author keywords. The former analyses the keyword co-occurrence network, thematic map, and evolution; the latter examines analytical structure mapping by keyword mapping.

5.2.1 Network analysis: Co-occurrence by author keywords

Keywords are the extremely condensed core content of an article. The basic principle of co-occurrence analysis is that when a specific word is repeatedly listed as a keyword, it means that the word is a conversational theme in this area. Two keywords appearing in the same document indicate that these two words have particular relevance, and that the conversational theme they represent has drawn researchers' attention. In their study, Donthu et al. (2021) mentioned the benefit of keyword co-occurrence in complementing other types of analyses. As co-citations and bibliographic couplings detect common themes within articles, thematic clusters derived

Table 6 Description of clustering results of author coupling

No	Label	Description	Freq	Centrality	Impact
1	Satisfaction	Collaborative consumption—conf 17.6% sharing economy—conf 14% satisfaction—conf 48%	25	0.3189	1.6798
2	Airbnb	Sharing economy—conf 18.6% trust—conf 32% airbnb—conf 57.7%	9	0.4393	3.0289
3	Impact	Innovation—conf 7.1% impacts—conf 25% future—conf 11.4%	13	0.2927	2.3660
4	Sustainability	Innovation—conf 13.3% consumption—conf 14.8% sustainability—conf 22.2%	22	0.4000	3.6749
5	Urban	Accommodation—conf 71.4% cities—conf 45.5% urban—conf 100%	10	0.2180	1.2896
6	Collaborative Consumption	Business models—conf 46.5% collaborative Consumption—conf 55.9% consumption—conf 35.8%	89	0.4401	2.7746
7	Management	Business models—conf 16.2% innovation—conf 14.3% management—conf 36.8%	32	0.4310	1.9085
8	Innovation	Innovation—conf 22.4% consumption—conf 18.5% business models—conf 14.1%	36	0.4465	3.1483
9	Business Model Innovation	Sharing economy—conf 4.7% airbnb—conf 7.7% business model innovation—conf 16.7%	4	0.3802	0.0000

from these methods tend to have fairly general themes; keyword co-occurrence analysis can help scholars flesh out the content of a specific cluster. They indicated that It is also possible to predict future research in the field when co-occurrence analysis includes keywords from the implications and research agenda sections of publications. As Donthu et al. (2021, p. 289) summed up, “co-word analysis is suitable for business scholars who wish to enrich their interpretations of co-citation analysis (past) or bibliographic coupling (present) and to predict forthcoming trajectories”.

From the co-occurrence network of the top 100 author keywords assessed by frequency of use (Fig. 4), five main groups can easily be identified: sharing economy (red), business model(s) (blue), SEBM application in tourism and hospitality (green), SEBM application in peer-to-peer network (purple), and platform economy (yellow). These five clusters, derived from the keyword co-occurrence in the dataset, represent main research themes existing in current SEBM literature. In this thematic cluster figure, each color represents a node and link, which can be used to explain how the theme (cluster) covers topics (nodes) and how topics (nodes) relate to each other (links) under that theme (cluster). A node’s size indicates the frequency at which a keyword appears. Co-occurrence between keywords is represented by the link between the nodes (i.e., keywords that occur together). A link’s thickness indicates how many times keywords co-occur together (i.e., how frequently they occur together). The larger the node, the greater the occurrence of the keyword, and the thicker the link between nodes, the higher the co-occurrence.

Figure 4 illustrates that the sharing economy group (red) has the largest number of nodes, and the sphere of the node is the largest in size. It can be seen that the “sharing economy” node has strong connections with other clusters and nodes

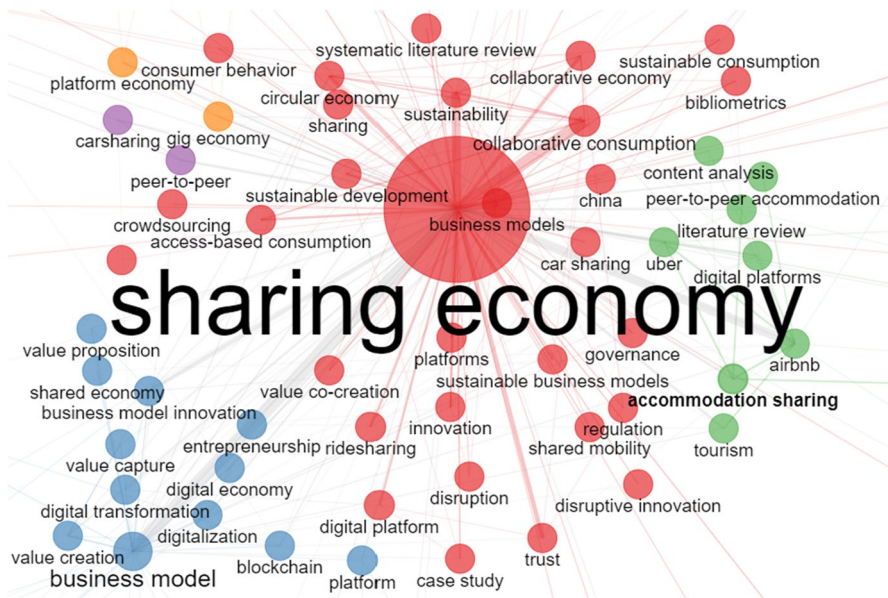


Fig. 4 Co-occurrence of top 100 author keywords (isolated nodes excluded)

(in different colors). Therefore, the sharing economy group can be treated as an umbrella group that covers knowledge of the sharing economy. The second largest node is “business models” (blue), which represents the SEBM area and includes value proposition, creation, capture, and more. The third largest cluster is about sharing platforms and comprises Airbnb, Uber, peer-to-peer accommodation, and tourism-related topics. The fourth cluster is about the application of SEBMs such as peer-to-peer, carsharing, and business-to-consumer. And finally, the fifth cluster is platform economy and related topics such as entrepreneurship. The detailed keywords captured from the dataset and their clustering results are listed in Table 7.

Key nodes in the “business models” cluster require further emphasis since it contains the largest number of keywords. The nodes of “innovation”, “consumption”, “collaborative consumption”, “framework”, “sustainability”, “future”, and “trust” can be identified as subgroups of the “business models” group. These subgroups and their nodes shown in Fig. 4 reflect the connections among thematic trends. The closer the two nodes, the stronger the connection between them. They are more likely to appear in an article and studied together. This result is further strengthened in the intellectual structure section with reference to the theme classification of niche, motor, emerging/declining and basic.

From the co-occurrence network of top 50 author keywords, a number of clusters can be identified by the size of the spots, and they are: sharing economy, business model(s), innovation, collaborative consumption, consumption, sustainability, and framework. These clusters represent all the keyword connectivity information in the dataset. However, all red spots are treated as one large cluster of “business models”, which contains subclusters of business model(s), innovation, collaborative consumption, consumption, sustainability, and framework.

5.2.2 Factorial analysis: word-map of analytical structure

A multiple correspondence analysis (MCA) was undertaken to draw a analytical structure (Fig. 5) of the SEBM area and detect clusters of articles that express common conversations. As Aria and Cuccurullo (2017, p. 969) explained, the results of an MCA “are interpreted based on the relative positions of the points [nodes in this study] and their distribution along the dimensions; as words are more similar in distribution, the closer they are represented on the map.” Therefore, Fig. 5 illustrates that the SEBM area has been investigated mainly in connection with six thematic clusters: the smallest cluster on the right (yellow) is largely related to value creation and value capture; the largest cluster on the second right (blue) concerns SEBMs in relation to sustainability, entrepreneurship, innovation, strategies, and applicable technologies; the cluster on the top (maroon) is strongly related to sustainable- and access-based consumption and review articles; the cluster at the bottom (purple) is related to platform economy including Airbnb, Uber, social media, peer-to-peer accommodation; the green cluster in the middle of the figure is connected to sustainable collaborative consumption; and the red one in the middle of the figure is about the knowledge of sharing economy and ecosystem for SEBM development such as customer behaviour, trust, regulation, and mobility. The result matches the outcome of author keywords co-occurrence clustering (Fig. 4).

Table 7 Co-occurrence of author keywords

Cluster (word count)	All found author keywords	Top five author keywords	Betweenness	Closeness	PageRank
1 (53)	Sharing Economy, Collaborative Consumption, Sustainability, Business Models, Circular Economy, Collaborative Economy, Innovation, Trust, Sustainable Development, Digital Platform, Ridesharing, Sustainable Business Models, Access-Based Consumption, Platforms, Value Co-Creation, Case Study, Disruptive Innovation, Car Sharing, China, Regulation, Shared Mobility, Bibliometrics, Crowdsourcing, Sustainable Consumption, Systematic Literature Review, Car-Sharing, Consumer Behavior, COVID-19, Disruption, Industry 4.0, Legitimacy, Social Media, Business Model Canvas, Business Model Design, Governance, Loyalty, Sharing, Sustainable Development Goals, Bike-Sharing, Bike Sharing, Business, Collaborative Fashion Consumption, Digitization, E-Commerce, Pricing, Social Value, Technology, Transportation, Typology, Urban Mobility, Access-Based Services, Access Economy, Digital Business Models	Sharing Economy Collaborative Consumption Sustainability Business Models Circular Economy	4012.051 20.062 28.718 19.215 3.104	0.010 0.006 0.006 0.006 0.006	0.284 0.046 0.040 0.031 0.019
2 (23)	Business Model, Business Model Innovation, Blockchain, Shared Economy, Digital Economy, Value Creation, Digitalization, Entrepreneurship, Digital Transformation, Strategy, Open Innovation, Platform, Value Capture, Community, Ecosystem, Internet, Value Proposition, Competition, Electricity Market, SMEs, Social Media Analytics, Cluster Analysis, Cooperation	Business Model Business Model Innovation Blockchain Shared Economy Digital Economy	221.387 15.851 0.985 0.000 0.129	0.007 0.006 0.005 0.004 0.005	0.062 0.017 0.007 0.003 0.007
3 (13)	Airbnb, Uber, Tourism, Digital Platforms, Literature Review, Content Analysis, Peer-To-Peer Accommodation, Accommodation Sharing, Online Platforms, Platform Capitalism, Ride Sharing, Collaborative Platforms, Corporate Social Responsibility	Airbnb Uber Tourism Digital Platforms Literature Review Peer-To-Peer Carsharing Business-To-Consumer	36.938 5.467 0.235 0.056 1.042 0.176 0.092 0.000	0.006 0.006 0.005 0.005 0.005 0.005 0.005 0.005	0.035 0.018 0.011 0.010 0.009 0.009 0.007 0.004
4 (3)	Peer-To-Peer Carsharing, Business-To-Consumer	Peer-To-Peer Carsharing Business-To-Consumer	0.000	0.005	0.004

Table 7 (continued)

Cluster (word count)	All found author keywords	Top five author keywords	Betweenness	Closeness	PageRank
5 (4)	Gig Economy, Platform Economy, Bibliometric Analysis, Digital Entrepreneurship	Gig Economy Platform Economy Bibliometric Analysis Digital Entrepreneurship	0.347	0.005	0.010
			0.473	0.005	0.010
			0.000	0.005	0.005
			0.000	0.005	0.004

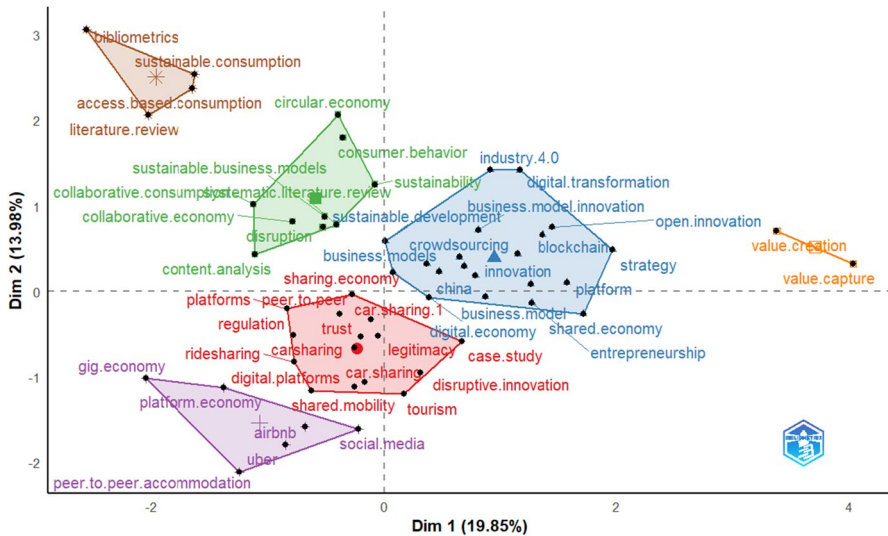


Fig. 5 Word-map of analytical structure (top 50 author keywords)

5.3 Intellectual structure

The intellectual structure of knowledge is most commonly investigated by employing two network-based approaches (Donthu et al. 2021): keyword co-occurrence and co-citation networks. Authro keywords co-occurrence analysis was done in previous sections. This section will focuses on co-citation analysis to answer research question five (RQ5, in introduction section).

5.3.1 Co-citation analysis

In a co-citation network, “two publications are said to be co-cited when there is a third one that refers to them simultaneously” (Lima and Carlos 2019). In the case of a large number of articles all referring to two publications, the co-citation connection between them will be very strong, thus they will appear very closely in the visual network map (Ding and Yang 2020). The author conducted a co-citation analysis to realize the thematic structure of the cited references in the SEBM field; and five clusters were detected.

Figure 6 shows these five clusters of the co-citation network of cited references, which indicates the intellectual structure of extant SEBM literature. The table lists all detected author(s) and the publication year of citation. The top five cited references, their betweenness (the shortest path between other nodes), closeness (how close a node to all other nodes), and PageRank (publication’s impact) are also listed next to the cited references (see Methodology subsection Metric measures and descriptions).

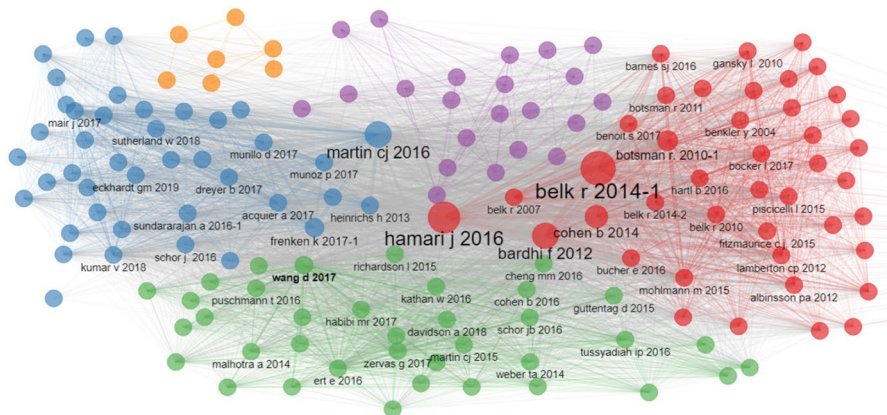


Fig. 6 Co-citation network of cited references (isolated nodes included)

The top five most referenced articles for cluster 1 are as follows: “You are what you can access: Sharing and collaborative consumption online” in *Journal of Business Research* (Belk 2014); “The sharing economy: Why people participate in collaborative consumption” in *Journal of the Association for Information Science and Technology* (Hamari et al. 2016); “Access-based consumption: The case of car sharing” on *Journal of Consumer Research* (Bardhi and Eckhardt 2012a); “What’s mine is yours”, published by *HarperCollins Business* (Botsman and Rogers 2010); and “Ride on! Mobility business models for the sharing economy” in *Organization & Environment*. The key research theme in these articles is collaborative consumption.

Cluster 2 is led by the following five publications: “The sharing economy: A pathway to sustainability or a nightmarish form of neoliberal capitalism?” in *Ecological Economics* (Martin 2016); “Sustainability perspectives on the sharing economy” in *Environmental Innovation and Societal Transitions* (Frenken 2017); “The sharing economy: Your business model’s friend or foe?” in *Business Horizons* (Kathan et al. 2016); “How to create value(s) in the sharing economy: Business models, scalability, and sustainability” in *Technology Innovation Management Review* (Acquier et al. 2019); and “Sharing economy: A potential new pathway to sustainability” in *Gaia-Ecological Perspectives for Science and Society* (Heinrichs 2013). The research theme of these articles is sustainability and the sharing economy, in particular the pathway to achieve sustainable development through the sharing economy.

The five key influential research papers in cluster 3 include “The rise of the sharing economy: Estimating the impact of Airbnb on the hotel industry” in the *Journal of Marketing Research* (Zervas et al. 2017); “Sharing economy: A review and agenda for future research” in *International Journal of Hospitality Management* (Cheng 2016); “Trust and reputation in the sharing economy: The role of personal photos in Airbnb” in *Tourism Management* (Ert et al. 2016); “Airbnb: Disruptive innovation and the rise of an informal tourism accommodation sector” in *Current issues in Tourism* (Guttentag 2015); and “A strategic framework for a profitable business

model in the sharing economy” in *Industrial Marketing Management* (Kumar et al. 2018). The focus of this cluster is SEBMs in tourism.

The top five most impactful articles in cluster 4 are “Business models, business strategy and innovation” in *Long Range Planning* (Teece 2010); “Value proposition design: How to create products and services customers want”, published by *John Wiley & Sons* (Osterwalder et al. 2015); “Agency theory: An assessment and review” in *Academy of Management Review* (Eisenhardt 1989); “A literature and practice review to develop sustainable business model archetypes” in *Journal of Cleaner Production* (Bocken et al. 2014); and “The business model: Recent developments and future research” in *Journal of Management* (Zott et al. 2011). These comparatively earlier papers are related to designing business models for value propositions underpinned by various theories.

Cluster five was mostly impacted by “You are what you can access: Sharing and collaborative consumption online” in *Journal of Business Research* (Belk 2014); “What’s mine is yours”, published by *HarperCollins Business* (Botsman and Rogers 2010); “Ride on! Mobility business models for the sharing economy” in *Organization & Environment* (Cohen and Kietzmann 2014); “Discrete wavelet transform: A signal processing approach”, published by *John Wiley & Sons* (Sundararajan 2016); and “Access-based consumption: The case of car sharing” in *Journal of Consumer Research* (Bardhi and Eckhardt 2012a). These articles extensively discussed platform business models for the sharing economy.

6 Towards a comprehensive analytical framework and future research agenda

Drawing on the previous results, this section answers the last two research questions (RQ6 and RQ7, in the introduction section) by synthesizing the state-of-the-art of the current research themes, generating a comprehensive analytical framework for SEBM research, and forecasting future research directions.

6.1 The state-of-the-art of current research themes in SEBM literature

Bibliographic article coupling (Fig. 2 and Table 8) detected that the research clusters of “collaborative consumption-sharing economy-satisfaction” and “accommodation-cities-urban” are emerging themes. Combining these three themes suggests that the potential research directions include satisfaction of (collaborative) consumption and urban accommodation. Article coupling detected five research themes existing in the current literature, and they can be analyticalized as consumption satisfaction, innovation for consumption sharing economy, consumption sharing economy, collaborative consumption framework and business models, and innovative pathways for consumption.

Bibliographic author coupling (Fig. 3 and Table 9) detected that the research cluster of the “satisfaction-centered consumption in sharing economy” can be classified as an emerging theme in SEBM research, even though the cluster is positioned at the

Table 8 Description of co-citation network (assessed by PageRank, refer to Methodology section Metric measures and descriptions)

Cluster	List of co-citations	Top five co-citations	Betweenness	Closeness	PageRank
1	Belk R 2014-1, Hamari J 2016, Bardhi F 2012, Botsman R. 2010-1, Cohen B 2014, Mohlmann M 2015, Belk R 2010, Lamberton Cp 2012, Bocker L 2017, Benoit S 2017, Belk R 2014-2, Belk R 2007, Botsman R 2011, Botsman R 2010, Barnes Sj 2016, Benkler Y 2004, Gansky L. 2010, Felson M 1978, Hartl B 2016, Piscicelli L 2015, Bucher E 2016, Albinsson Pa, 2012, Fitzmaurice C.J. 2015, Helliwig K 2015, Fornell C 1981, Habibi M.R. 2016, Leismann K 2013, Ozanne LK 2010, Pedersen Erg 2015, Stephany A 2015, Tussuyadiah I. 2015, Mohlmann M. 2015, Rifkin J. 2014, Ajzen I 1991, Hwang Jy 2017, Lawson Sj 2016, Edbring Eg 2016, Barnes Sj 2017, Wilhelms Mp 2017, Jiang Bj 2018, Scaraboto D 2015, Zamani B 2017, Benjaafar S 2019	Belk R. 2014-1 Hamari J. 2016 Bardhi F. 2012 Botsman R. 2010-1 Cohen B. 2014	554.328 414.066 272.489 171.197 215.244	0.005 0.005 0.005 0.005 0.005	0.028 0.026 0.022 0.017 0.018
2	Martin C. 2016, Frenken K 2017-1, Acquier A 2017, Heinrichs H 2013, Munoz P 2017, Kumar V 2018, Mair J 2017, Sundararajan A 2016-1, Murrillo D 2017, Schor J. 2016, Sutherland W 2018, Eckhardt Gm 2019, Dreyer B 2017, Parente Rc 2018, Ritter M 2019, Plewnia F 2018, Ter Huurne 2017, Geissinger A 2019, Cockayne Dg 2016, Curtis Sk 2019, Perren R 2018, Frenken K 2017-2, Parguel B 2017, Daunoriene A 2015, Tauscher K 2018, Anonymous No, Gerwe O 2020, Laukkanen M 2020, Laurell C 2017, Leung Xy 2019, Kenney M 2016, Paigan Yv 2017, Piscicelli L 2018, Ciulli F 2019, Ranchordas S. 2015, Curtis Sk 2020, Tranfield D 2003, Emav L 2016, Clauss T 2019, Hossain M 2020, Wirtz J 2019	Martin C. 2016 Frenken K. 2017-1 Acquier A. 2017 Heinrichs H. 2013 Munoz P. 2017	449.540 175.853 140.644 109.727 87.923	0.005 0.005 0.005 0.005 0.005	0.020 0.015 0.015 0.011 0.010
3	Zervas G 2017, Kathan W 2016, Cheng Mm 2016, Ert E 2016, Guttentag D 2015, Richardson L 2015, Habibi Mir 2017, Cohen B 2016, Malhotra A 2014, Puschmann T 2016, Weber Ta 2014, Cusumano Ma 2015, Tussuyadiah Ip 2016, Wang D 2017, Dredge D 2015, Martin Cj 2015, Guttentag D 2018, Davidson A 2018, Richter C 2017, Constantiou I 2017, Henten A. 2016, Oskam J 2016, Fang B 2016, Matzler K 2015, Schor Jb 2016, Edelman B 2017, Gutierrez J 2017, Akbar Y'h 2018, Lutz C 2018, Milanova V 2017, Priporas Cv 2017, Yang S 2017, Breidbach Cf 2017, Heo Cy 2016, Guttentag Da 2017, Zhu G 2017, Bellos I 2017	Zervas G. 2017 Kathan W. 2016 Cheng M. 2016 Ert E. 2016 Guttentag D. 2015	214.999 207.220 128.800 106.539 36.891	0.006 0.006 0.005 0.005 0.005	0.013 0.012 0.011 0.012 0.008
4	Teece D 2010, Osterwalder A. 2014, Eisenhardt Km 1989, Bocken Nmp 2014, Zott C 2011, Boons F 2013, Sundararajan A 2016-2, Mont Ok 2002, Schaltegger S 2016, Zott C 2010, Chesbrough H 2010, Rochet Jc 2003, Tukker A 2004, Tukker A 2015, Amit R 2001, Chesbrough H 2002, Eisenhardt Km 2007, Foss Nj 2017, Casadesus-Masanell R 2010, Eisenmann T 2006, Massa L 2017	Tecee D. 2010 Osterwalder A. 2014 Eisenhardt K. 1989 Bocken Nmp 2014 Zott C. 2011	9.255 8.655 10.018 13.553 1.796	0.005 0.005 0.005 0.005 0.004	0.008 0.006 0.005 0.005 0.006

Table 8 (continued)

Cluster	List of co-citations	Top five co-citations	Betweenness	Closeness	PageRank
5	Belk R. 2014, Botsman R. 2010-2, Cohen B. 2014, Sundararajan A. 2016, Bardhi F. 2012, Hamari J. 2016, Heinrichs H. 2013	Belk R. 2014 Botsman R. 2010-2 Cohen B. 2014 Sundararajan A. 2016 Bardhi F. 2012	0.000 0.000 0.000 0.000 0.000	0.033 0.033 0.033 0.033 0.033	0.009 0.007 0.007 0.005 0.007

boundary of emerging themes and specialized themes. The author coupling recovered nine themes in SEBM research, and they are collaborative consumption satisfaction, trust in Airbnb, innovation impacts in the future, innovation consumption sustainability, accommodation in cities and urban, business models for collaborative consumption, SEBM innovation management, SEBM innovation for consumption, and Airbnb business model innovation.

The co-occurrence analysis of the top 50 author keywords unearthed three SEBM research themes: literature on sharing economy, business model(s), innovation, collaborative consumption, consumption, sustainability, and framework.

According to Castriotta et al. (2019), the analytical structure of a research area can be explored to establish the state-of-the-art research and identify prospects for future studies; various approaches can be taken such as analysing the influence of keywords, authors, articles, journals, and contributions by country. Figure 5 shows the keywords in the centre of the word-map include collaborative consumption, antecedents, pathway, impact, mobility, entrepreneurship, and circular economy in addition to words representing SEBMs. By considering these keyword findings with those of bibliographic coupling, antecedents, entrepreneurship, and circular economy can be proposed for future research, since they have been at the center and frontier of SEBM studies and are likely to remain so.

Co-citation network analysis combined with co-occurrence analysis identified three clusters. The large spheres in Fig. 6 represent the most cited articles. These will continue to influence the development of the SEBM area and, therefore, point to potential research opportunities. R. Belk's (2014) article "You are what you can access: Sharing and collaborative consumption online", published in the *Journal of Business Research*, and J. Hamari's (2016) "The sharing economy: Why people participate in collaborative consumption", published in the *Journal of the Association for Information Science and Technology*, signal that collaborative consumption online has potential as a research direction. With many citations, the articles "Access-based consumption: The case of car sharing", published in the *Journal of Consumer Research* (Bardhi and Eckhardt 2012b), and "Ride on! Mobility business models for the sharing economy", published in *Organization & Environment*, indicate that riding-sharing is still an academic interest.

6.2 Towards a comprehensive analytical FRAMEWORK for SEBM research

The abovementioned current research themes in the SEBM area are summarized in Table 9. This gives a clear picture of the themes detected by each type of analysis. It can be noticed that bibliographic coupling (articles and authors) revealed a focus on consumption, while the themes unearthed by author keywords pinpoint business models, their applications, and platform economy. Word-map analysis identified clusters that concentrate on a range of miscellaneous subjects such as value proposition, creation, and capture; and the relationship between SEBMs and sustainability, entrepreneurship, innovation, strategies, and applicable technologies. Lastly, the themes uncovered by co-citations are related to collaborative consumption, sustainability, and SEBMs in tourism, business models design, and platform business model.

Table 9 Research themes detected by different analyses

Detected by article coupling	Detected by author coupling	Detected by author keywords	Detected by word-map	Detected by co-citation
Consumption satisfaction	Collaborative consumption satisfaction, trust of Airbnb	Knowledge of sharing economy	Value creation and value capture of SEBMs	Collaborative consumption
Consumption innovation for sharing economy	Innovation impacts in the future	Business model(s)	SEBMs in relation to sustainability, entrepreneurship, innovation, strategies, and applicable technologies	Sustainability and sharing economy
Consumption sharing economy	Innovation consumption sustainability	SEBM application in tourism and hospitality	Sustainable- and access-based consumption and review articles	SEBMs in tourism
Collaborative consumption framework and business models	Accommodation in cities and urban	SEBM application in peer-to-peer network	Platform economy Determinants and ecosystem for SEBM development including Airbnb, Uber, social media, peer-to-peer accommodation	Designing business models for value propositions
Innovative pathways for sustainable consumption	Business models for collaborative consumption SEBM innovation management, SEBM innovation for consumption, and Airbnb business model innovation	Platform economy	Sustainable collaborative consumption Determinants and ecosystem for SEBM development	Platform business model for sharing economy

These themes can be analyticalized for the purpose of developing a comprehensive framework for SEBM research, as depicted in Fig. 7. Three categories were devised as a means to organize SEBM research: knowledge of sharing economy, supplier-oriented, and consumer-socioeconomic-sustainability-focused. SEBM knowledge includes literature regarding sharing economy and business models innovation, determinants, and ecosystem. The supplier-oriented category incorporates three dominant conversations: Airbnb and peer-to-peer accommodation, Uber and car-sharing, and platforms for other industries. The consumer-socioeconomic-sustainability-focused category comprises three conversations: consumption and customer satisfaction; collaborative consumption behavior; and effects of sustainable development, social effects, and economic growth.

6.3 Forecasting future research directions—a holistic view

A number of current thematic trends were detected through the five thematic analyses detailed in the results section under bibliographic coupling, analytical structure, and intellectual structure. Since all detected themes are interconnected due to their underlying associations among articles, authors, keywords, and citations, these themes need to be discussed as a whole. This subsection provides a holistic view in regard to future research directions by combining the results of this study. First, as shown in Fig. 7, recent topics include the driving forces and customer behaviors in relation to Airbnb, Uber, and other SEBMs. The determinants and effects of Airbnb and similar peer-to-peer accommodation SEBMs have attracted scholars' interest (Kabadayi et al. 2022; Kaushal and Prashar 2022). Those who drive vehicles within the Uber model have been investigated from perception, regulation, and determinant perspectives (Tham 2016; Tham and Ogulin 2021). Other SEBMs involving fashion, riding, and energy are still popular themes (Liu et al. 2022; Zheng et al. 2022; Zhghenti and Gedenidze 2022). A legal and political conversation has arisen, specifically in regard to how different regulations and policies as drivers of innovation and competition may foster or hinder sharing economy growth (Benoit et al. 2022; Rojanakit et al. 2022).

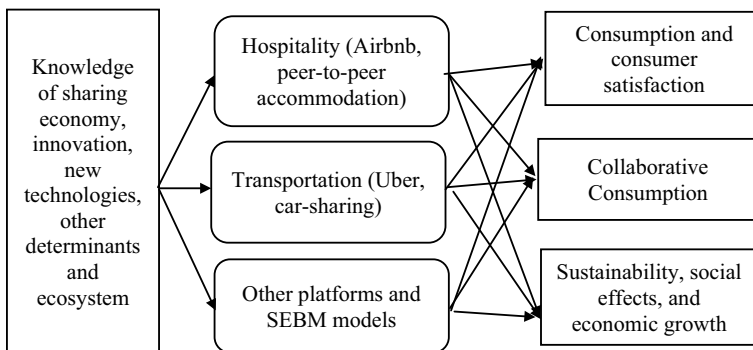


Fig. 7 Comprehensive analytical framework for SEBM research

Second, the study found that, even though the largest number of studies are from developed countries in some areas of sharing economy research (Lima and Carlos 2019; Silva and Moreira 2022), this is not the case for business model studies. Among the top 20 most influential countries (Table 10, assessed by citation numbers), eight of them are emerging countries such as China, India, Indonesia, Czech Republic and Russia. China, as an emerging economy, is the top contributor in SEBM publications. This result illustrates that the interest in SEBM study may be strongly related to the country's population, rather than economic development. As there are structural, economic and cultural disparities among these countries, future studies should be conducted in comparative contexts (advanced and developing countries) to determine what drives sharing economy and business-model research. Scholars could benefit from the insights afforded by investigations into the determinants that foster and hinder SEBM research to enhance current analytical frameworks.

Table 10 Most influential country by citation numbers

Country	Average Citations Per Article	Sum of Articles	Sum of TC
USA	25.59	191	1868
GERMANY	19.77	116	1285
CHINA	8.61	256	1171
UNITED KINGDOM	25.39	95	1117
AUSTRALIA	38.9	55	817
SWEDEN	19.66	65	570
NETHERLANDS	32.19	38	515
CHILE	256.5	4	513
SPAIN	9.48	90	455
NORWAY	48.89	16	440
KOREA	23.75	18	380
FINLAND	18.58	37	353
CANADA	23.38	21	304
ITALY	9.43	61	264
HUNGARY	23.6	14	236
FRANCE	19.5	37	234
BRAZIL	9.82	50	216
DENMARK	24.88	22	199
AUSTRIA	35.8	16	179
SINGAPORE	26.4	14	132
POLAND	6.53	29	98
SOUTH AFRICA	19.4	12	97
QATAR	46.5	4	93
LITHUANIA	12.67	13	76
THAILAND	24	5	72

Third, the results of keywords co-occurrence and word-map analyses indicated that ecosystem and location-specific (country, region, and culture) determinants for SEBMs are worth further investigation. The nurerced research found that not only are a large proportion of articles location-cultural-specific, but non-location-fit SEBMs further indicated the importance of location-cultural-fit. For example, Uber was acquired by Didi in the ride-sharing industry, eBay left the Chinese market because of Alibaba, and Groupon was defeated by Meituan in the group-buying sector. The author argues that future location-specific studies should be conducted from a geographic entrepreneurial ecosystem perspective in addition to current organisational business ecosystem focus.

Fourth, “collaborative consumption” and on-demand service business models have been and will continue to be an important direction since it has close links with consumption, tourism, opportunities, antecedents, model, impact, Airbnb, online, trust, behavior, consumer, and information (Mitchell and Strader 2018). Further, it has economic, social, and sustainability characteristics: reducing customers’ expenses, providing social benefits, and being environmentally friendly (three bottom line theory). More importantly, collaborative consumption and on-demand service business models integrate e-commerce, social media frameworks, and SEBMs. Future research needs to focus on how e-commerce and social media platforms generate collaborative consumption and on-demand services.

Fifth, with a large portion of analyzed articles emphasizing the importance of sustainability from either business development, business model or environmental perspectives, it is clear that SEBMs have been examined analytically and empirically based on theories of sustainability and this will continue to be a thematic conversation. The keyword co-occurrence and wor-map analyses revealed that the topics of innovative and sustainable business models in relation to entrepreneurial opportunities and challenges (Qin 2022; Richter et al. 2017; Tescasiu et al. 2018) had been an important trend. The bibliographic coupling, conceptual structure, and intellectual structure analyses all implied that future sustainability considerations should include location, industry, platforms, innovation, and new technologies.

Sixth, the effect of new technologies in SEBMs is an obvious direction for future research as shown in different analyses such as innovation in article and author cupling, digital transformation in keyword co-occurrence. Technology-driven innovations have driven SEBM practices (Yin 2022). Big data and block chain have become trending keywords in thematic analysis (Li et al. 2022). Key research themes include (1) block chain and information management, (2) tourism, digital business, and digital technology; (3) big data, new business models, and business modelling, and (4) sales, ecosystem, and open data. How to apply new technologies in SEBM development and how the technologies impact SEBMs are valuable research questions.

Finally, the effects of COVID-19 have changed the ecosystem for the sharing economy as well as people’s behaviour (Akan and Tepeler 2022); hence, the ramifications of COVID-19 for the sharing economy post the pandemic need to be examined. COVID-19 effects on SEBM development has become a new trend in sharing economy research (Pawlicz et al. 2022), and “COVID-19” has become a top co-occurred author keyword by this study (see Table 7). Sixty-seven out of 951 articles

pointed to the pandemic as a research direction. Although the end of COVID-19 is in sight, the effects will not disappear overnight. How would SEBMs be able to attain competitive advantage in a post-COVID era? What are the modeling strategies to maintain existing and create new value: partnership or confrontation, nurturing or destructive, open or closed innovation, and empathetic or uncaring?

7 Discussion

7.1 A summary of findings

This timely study was designed to investigate the current research themes, analytical framework, and future trends of SEBM literature through indicators of bibliometric analysis, as well as content analysis by applying bibliometric analysis. It examined a dataset of 951 articles from 552 sources between 2014 and mid-2022, extracted from WoS and Scopus. As a matter of fact, the database searches did not return any SEBMs-relevant articles prior to 2014, even though the search query did not have a year limitation. Thus, it can be asserted that the SEBM study started in 2014, with an annual growth rate of 50.98% (see Table 1), and the area has been growing exponentially since then. In addition to providing a visual analysis of keywords, co-citation and co-occurrence investigations, a number of bibliographic coupling networks, thematic maps and word-map landscapes were produced through R-package to determine the bibliographic couplings, analytical structure, and intellectual structure in SEBM area. Based on the results, a comprehensive analytical framework and future research agenda were generated.

A number of research themes were detected through the article and author coupling, and thematic analysis for the entire dataset. To summarise, the current themes in SEBMs studies are (1) industry-oriented research such as transportation, tourism, accommodation, energy and others, (2) sustainability-oriented studies, including social, environmental and economic perspectives, (3) sustainable organizational development concerning social acceptance, trust, legitimacy and satisfaction, (4) new technology-oriented and innovation-focused studies such as blockchain, big data, social media and e-platforms, (5) country- and region-oriented studies, particularly for emerging countries, (6) effects of entrepreneurial ecosystem factors on SEBMs development, including government, law, finance and social norms.

These research themes will serve as an analytical framework for SEBM for the current and in the future. The themes can be classified into three categories: (1) knowledge of sharing economy (including innovation, new technologies, determinants and ecosystems); (2) supplier-oriented studies (including hospitality-oriented, transportation-oriented, and other platforms and models); and (3) consumer-socio-economic-sustainability-focused (including consumption and customer satisfaction, collaborative consumption, sustainability, social effects, and economic growth). These themes and categories further confirm that SEBM studies need to be comprehensively conducted from multi- and inter-disciplinary perspectives.

To synthesize the research agenda analysis, it is necessary to conduct further studies that consider: (1) the factors driving or determining SEBM development from an

emerging economy perspective; (2) the impact of country or region entrepreneurial ecosystems on SEBMs development, including social and cultural effects, in addition to company-focused business ecosystems; (3) systematic studies on the long-term effects of SEBMs on sustainable socioeconomic, social, and environmental development; (4) the relationship among collaborative consumption, e-commerce, platform economy, and SEBMs; (5) SEBM competition between private and public practices; (6) new technology application in SEBMs; sustainable development of sharing economy; and (7) COVID-19 effects and strategies for crisis management.

7.2 Contribution and implication

This study represents a significant contribution to the SEBM research field and identifies implications for policymakers and practitioners. On the theoretical side, the study developed a seven-dimension analytical framework for SEBMs based on current research themes. These dimensions can be classified under the knowledge of sharing economy, supplier-oriented studies, and consumer-socioeconomic-sustainability-focused categories. In addition to the analytical framework, the study forecasted future research directions for the post-COVID-19 era. Among others, the paper proposes six key research directions, including determinants and ecosystems, emerging economies, new SEBMs, location- and culture-specific models, sustainability, and combined impacts on socioeconomics.

This study shows results that are more comprehensive and holistic when compared to previous SEBM framework studies (Akbar and Hoffmann 2022; Benoit et al. 2022; Ritter and Schanz 2019). The new framework clarifies some of the apparent paradoxes surrounding the sharing economy debate, such as the fact that sustainability and social impact are only being studied as one of the outcomes at present. It partially explains why the connections between business models and uses sometimes decline over time (Frenken and Schor 2017) and why there is a lack of both trust and a sense of community (Bardhi and Eckhardt 2012a, b). By providing a lens for understanding current challenges, as well as a tool for developing and analyzing successful SEBMs, this framework can serve as a new method for analyzing and predicting SEBMs' future potential. SEBMs that do not consider all dimensions of the proposed framework may need to be improved. The framework can be used to establish a new model or assess an existing model and its innovation categories. Radical SEBM innovations may be distinguished from incremental innovations if SEBM is being designed, or redesigned to cover more constructs in the framework. It is also possible to differentiate simultaneously between value propositions, value delivery, and value capture from the perspective of service providers, users, and socioeconomic factors within the framework.

This study contributes to the development of new knowledge not only in the scholarly sphere, but also in the policymaking and practice arena. In terms of SEBM development, the identified research themes and analytical framework appear to have significant implications. As a result of the discovery that country-specific, region-specific, and city-specific SEBMs play an important role in deploying localized SEBMs, policymakers and practitioners have clear directions

to follow. Accordingly, the results of this study have significant implications for SEBM development practices: practitioners can prepare business progress plans in advance based on the research themes and determinants identified in this study. Furthermore, a framework of this kind could also be applied in order to systematically identify the differences between SEBMs that are the basis for the different sharing models, from the perspectives of knowledge, suppliers, and socio-economic and environmental impacts.

From the methodology perspective, to the author's best knowledge, this research is the first to apply a variety of quantitative analyses, including clustering (article and author coupling), conceptual structure analysis (author keyword co-occurrence network and word-map factorial structure), and intellectual structure analysis, to develop a holistic and comprehensive analytical framework for the field. The findings showed that (1) different clustering, analytical and intellectual structure analysis mechanisms create different results, even though the difference may be insignificant; (2) the method of applying clustering multi-technologies in one study does create complementary results, and is recommended for a holistic and comprehensive exploration study; and (3) author coupling detected more clusters than other mechanisms in this study, thus making it the most effective mechanism. In general, therefore, the method of using multi-clustering mechanisms for identifying analytical frameworks to other areas of research is recommended.

Currently, the application of five combined thematic analyses (article coupling, author coupling, keywords co-occurrence, word-map, and co-citation) to investigate the latest research themes and forecast future research directions is not common. Most scientometric studies apply one method in this type of investigation (Nasir et al. 2021; Tepe et al. 2022). Author keywords are most commonly used, followed by co-citation analysis. Applying article and author coupling is rare (Bhattacharya and Basu 1998). This study proved that these analyses are complementary. For example, themes such as collaborative consumption satisfaction, trust of Airbnb, innovation impacts in the future, innovation consumption sustainability, and accommodation in cities and urban areas were only detected through these two bibliographic analyses. Therefore, this study highlights the benefits of applying these five analyses to investigate current research themes in a field and forecast research directions.

In addition to the contribution to the SEBM arena, this study contributes to the sharing economy literature as a whole, by identifying and developing a more comprehensive view of sharing economy research while encouraging new research directions. From a sharing economy field perspective, studies should anticipate multiple research contexts, given that the sharing economy is a complex phenomenon that requires the involvement of a variety of parties (Kraus et al. 2020). Based on analyses of clustering as well as analytical and intellectual structure, a foundation was formed that represents the most comprehensive normality research on the sharing economy, providing a shortcut for research on author and article coupling, co-occurrence of author keywords and word-map factorial analysis, and co-citations analysis.

8 Conclusion

The sharing economy is growing in terms of the number of enterprises and is contributing to wealth creation and job generation. Consequently, it is a key driver in fostering economic development. The current economic crisis caused by the COVID-19 pandemic can promote the concept and practice of the sharing economy due to increased frugality within some customer segments (Kraus et al. 2020; Kraus et al. 2020). Therefore, synthesizing various scientometric methods to detect thematic research trends and forecast research directions will help to enhance SEBM research. This work will also help to develop new business models that might become necessary in a post-COVID-19 socioeconomic environment.

Current research on SEBMs focuses on sustainability, sustainable development, tourism, technologies, and business and management, with less attention paid to social effects and acceptance, determinants of success, national entrepreneurial ecosystem, and cognition. Based on the current thematic map and co-words with the themes, the paper concluded by suggesting six potential research directions. By providing new knowledge, the research contributes to related disciplines because of the multi- and inter-disciplinary features of SEBM research. It also has numerous implications for policymakers and practitioners.

This study faced limitations. By its nature, a bibliometric study focuses on the accumulated scientific production of a given area, subject, or field within a given period. As the results showed, in the SEBM field, the period is very recent (2014–2022). Thus, the field can be understood as still in the emerging phase; that is, its foundations have not been entirely established. Another limitation is that some studies may have been omitted from this research due to the inclusion and exclusion criteria established by the authors.

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Data availability The datasets generated for this study are available by email to cduan@myune.edu.au.

Declarations

Conflict of interest The author confirms that this work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere. There are no conflicts of interest to disclose.

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