

Review

Sustainable Knowledge-Based Enterprise Products Using AI-Powered Social Media for Enhancing Brand Equity: A Scientometric Review

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Abstract

Sustainability-driven products rely heavily on market success and customer awareness to achieve their intended impact. While knowledge-based enterprises (KBEs) are committed to enhancing the sustainability of their products and services, they often face challenges in building brand equity and raising awareness of what makes their products sustainable, particularly within social media engagement. AI agents transfer social media and enable KBes to promote sustainable products by enhancing brand equity. However, this requires an effective strategy to enhance brand equity among the new social media generation. This study highlights critical factors identified through a rigorous literature review that influence the enhancement of brand equity in KBes, with a focus on sustainable development and brand innovation. This research employs a mixed-method approach using VOSviewer and NVivo software. A scientometric review of articles published in the Scopus database and a critical thematic analysis were conducted. Furthermore, Google Trends data were utilized to complement the analysis and propose a set of key factors and future directions. Out of 1552 articles extracted from scientific databases from 1994 until 2024, 33 articles were selected and thoroughly analyzed after a rigorous screening and evaluation process. The review demonstrates that social media enhances brand equity for KBes by increasing brand awareness, improving their efforts in sustainable development, strengthening brand image, strengthening customer loyalty, and facilitating effective interactions. Moreover, leveraging brand innovation and focusing on sustainable development through social media amplifies these positive impacts, further influencing the brand's perceived quality. This research uniquely identifies the value of sustainability in the brand equity model and the moderating roles of technological complexity and customer environmental sensitivity in this process. The research offers significant insights for managers of science and technology parks, guiding them to adopt effective social media strategies that create sustainable competitive differentiation and strengthen brand positioning in competitive markets. This study also establishes a strong foundation for future studies focusing on AI-powered tools for brand equity within the digital environment by proposing a set of factors that can be used by researchers to develop an initial model.



Academic Editor: Ja-Shen Chen

Received: 20 June 2025

Revised: 29 August 2025

Accepted: 5 September 2025

Published: 19 September 2025

Citation: MohammadEbrahimzadeh, S.; Khajeheian, D.; Arbatani, T.R.; Labafi, S.; Sepasgozar, S. Sustainable Knowledge-Based Enterprise Products Using AI-Powered Social Media for Enhancing Brand Equity: A Scientometric Review. *Sustainability* **2025**, *17*, 8427. <https://doi.org/10.3390/su17188427>

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Keywords: brand equity; social media; sustainable products; knowledge-based enterprises; sustainable development goals (SDGs); innovation; digital branding; digital marketing

1. Introduction

The current research reveals a notable gap in integrating sustainability metrics within conventional brand equity models [1]. While some research focuses on corporations, there is a significant opportunity to explore startups and KBEs. At the same time, advances and integration of AI-powered tools and social media introduce a new era of digital marketing and new possibilities that offer significant opportunities for small and medium-sized enterprises (SMEs) to enhance their brand equity [2]. AI technologies enable SMEs to deliver personalized customer experiences, gain data-driven insights, and drive product innovation, demonstrating transformative potential in the digital marketplace [3]. These advancements are particularly beneficial for KBEs that promote sustainable products, as AI can help effectively communicate sustainability features to potential customers.

Recent publications have underscored the advantages of AI in marketing, highlighting its ability to facilitate firms' successful use of automation tools [3]. However, research indicates a lack of comprehensive strategies that effectively combine AI technologies with digital marketing tools to enhance brand equity levels for SMEs consistently [4]. The current body of research lacks a comprehensive approach that effectively integrates the often-siloed concepts of emerging technical innovations, such as AI-powered social media, with the important concerns of sustainability and brand equity within the unique context of KBEs. This refers to a gap demonstrating the necessity for an integrated framework enabling SMEs to leverage AI effectively to improve their product brand equity in the digital age while addressing sustainability concerns.

Hue and Hung (2025) [5] identified some gaps in the literature of branding. Their review highlights the absence of a comprehensive framework that integrates the use of AI-powered social media with sustainable branding and stakeholder management. While current research focuses on how companies use AI for marketing and customer relationships, it often overlooks the broader network of stakeholders and the critical role of sustainability. This suggests synthesizing existing research to provide a comprehensive framework for companies to leverage AI in building sustainable brands and managing stakeholder relationships. Future research can focus on developing AI integration strategies specific to SMEs, considering factors such as organizational readiness, skill development, and ethical implications [6]. This strategy would equip SMEs with a framework to address the needs and requirements of digital transformation and AI integration [7]. This supports their efforts to enhance brand equity and maintain competitiveness as AI transforms business models.

According to a recent Forbes report, 90% of start-ups fail, and only 10% can continue their activities successfully [6]. The same report adds that 42% of these failures are related to the lack of a suitable market for their products. Another report states that 70% of failures occur between the second and fifth years. This period is critical for product introduction and market recognition when the company must establish itself as a valuable brand. Given the low success rate of KBEs, every new entrepreneur needs to revisit conventional strategies and adopt effective strategies aligned with global changes to enhance their brand. Another article highlights that 22% of these companies fail due to the lack of an appropriate marketing strategy, which removes them from the competitive market [8]. Forbes, quoting the CEO of a major startup, emphasizes that, considering the poor success rate of startups, every new entrepreneur must reevaluate traditional techniques. Conventional branding

and brand equity enhancement strategies are almost a path to failure for many start-ups with limited capital [6].

Governments have established science and technology parks and incubators to foster a knowledge-based economy and promote sustainability. This initiative aims to bring universities closer to industry and strengthen innovation by supporting technology-based and start-up units aligning with SDGs. However, start-ups face significant challenges in enhancing their brand and commercializing their products and services. These challenges arise mainly due to the importance of brand equity at the national and international levels [6]. Many KBEs fail or experience limited growth in their early years, while only a few grow into large corporations. This issue, despite the vital role of these companies in the economic development of countries, is considered a fundamental challenge [6]. These challenges become increasingly complex with the advancement of technology, which requires significant investment and relies on rapidly evolving technologies.

AI also transforms advertisements and promotion practices. Instead of being intrusive, audiences voluntarily follow it. This shift highlights the importance of creating visually appealing and distinctive advertisements [6]. Creating creative and unique stories helps brands strengthen their identity and better connect with their audience. Given the interdependence of global markets and customers' access to international products and services, manufacturing and service companies must focus on developing their global brands. This helps companies grow and create shareholder value [6]. Local brands that offer high-quality products at reasonable prices can enter the global market and become representatives of their country's culture and scientific prowess. Additionally, the growth and development of e-commerce in recent decades have enabled brands to access new markets [6]. Internet branding refers to online marketing strategies that enhance brand equity and can effectively contribute to developing local brands in the global market.

On the other hand, sustainable development considerations and brand innovation strategies, particularly through the strategic use of social media, have opened up unique opportunities for KBEs. These enterprises can utilize social media platforms to effectively communicate how they have integrated sustainability principles, such as resource efficiency, ethical production, and reduced environmental impact, into their core strategies and knowledge-based products. Social media enhances brand visibility and fosters stakeholder dialogue, promoting sustainable practices and innovative solutions that align with global environmental and social responsibility demands. With increasing consumer awareness of ecological and social issues, brands prioritizing sustainable development can attract customer loyalty and create significant market differentiation. The innovative use of diverse social media platforms enables firms, or any economic unit, to communicate their advantages or core values effectively and introduce their brand as responsible and innovative [6].

The results of studies show that no valid research has been conducted so far on modeling the enhancement of brand equity in KBEs using social media. This research aims to support model development in the context of brand equity enhancement in KBEs through social media, improving the understanding of these companies' behavior in enhancing brand equity. Analyzing practical factors, including their strengths and weaknesses, will yield valuable insights.

Given the significance of social media as a powerful and efficient tool for enhancing brand presence and customer engagement, this study aims to address the following three research questions: (RQ1) What are the dominant research patterns, thematic trends, and knowledge gaps in the study of brand equity and social media strategies for KBEs to inform future research on factor identification and modeling approaches? (RQ2) What are the influential factors in enhancing brand equity for KBEs through social media? (RQ3) What

are the research gaps in the field that can be continued as future directions for enhancing brand equity for KBEs with the consideration of sustainability through AI-powered social media? To address these questions, we employ a systematic literature review methodology. This approach allows us to synthesize the diverse and evolving body of academic literature on the subject, providing a comprehensive overview of the research landscape rather than an analysis of raw data from social media platforms.

2. Methodology

This study employs a systematic, multi-faceted methodology to investigate the enhancement of brand equity for KBEs through social media, emphasizing the integration of sustainability. The research design combines bibliometric, thematic, and trend analyses to address the research objectives comprehensively. The methodology is structured to ensure transparency, replicability, and alignment with rigorous academic standards, utilizing high-quality data from the Scopus database and advanced analytical tools, including VOSviewer, NVivo, and Google Trends.

2.1. Theoretical Foundation

The study adopts a customized systematic literature review (SLR) as its core methodological framework, inspired by some protocols [9,10] to synthesize existing knowledge. This approach addresses RQ1 by identifying research patterns, thematic trends, and knowledge gaps in the study of brand equity and social media strategies for KBEs. Then, it enables the identification of key factors influencing brand equity in KBEs (RQ2) and the development of preliminary sustainability-integrated research directions (RQ3). The SLR is designed to be transparent, focusing on the intersection of brand equity, social media, and KBEs while recognizing the increasing importance of sustainability in contemporary business models. This theoretical foundation positions the study as a forward-looking contribution to the field of branding research.

2.2. Data Source Selection

The Scopus database was chosen for its extensive coverage of peer-reviewed journals in management, marketing, and social sciences. Its comprehensive indexing and robust citation metrics make it an ideal source for accessing high-quality articles relevant to the research objectives. Scopus supports the bibliometric and thematic analyses required to map the intellectual structure of the field and identify emergent themes.

2.3. Search Strategy

Initially, keywords related to the research topic, such as combinations of “brand equity,” “KBEs,” and “social media,” are identified and used. These keywords and associated words are searched within the Scopus database to retrieve a comprehensive collection of relevant articles. The literature search was conducted in Scopus, targeting English-language articles published between 1994 and early 2024. A carefully crafted search string was applied to titles, abstracts, and keywords to capture studies on brand equity and social media:

(“brand equity” OR “brand awareness” OR “brand association” OR “perceived quality” OR “brand loyalty”) AND (“social network” OR “social media” OR “digital brand” OR “digital marketing”)

This query retrieved 1552 articles, providing a broad dataset to explore the intellectual landscape and thematic trends relevant to RQ1. The search also uncovered sustainability as an emergent theme, which was further investigated for RQ2 through subsequent analyses.

2.4. Article Screening and Selection

The articles retrieved during the initial search are screened based on criteria such as research quality, relevance to the topic, and alignment with the selected aims [11]. At this stage, the articles are categorized into relevant and irrelevant groups, and only high-quality, relevant studies are selected for further analysis.

The article selection process was conducted using three rounds of searches to ensure relevance to the research objectives.

- In the first round of the search, the dataset was refined by incorporating keywords related to KBEs, such as “company,” “enterprise,” “knowledge-based company,” “KBE,” “startup,” and “start-up,” and limiting the timeframe to 2008–2024 to focus on contemporary research. Inclusion criteria required articles to address brand equity and social media, while exclusion criteria removed irrelevant sources, such as those in technical engineering, books, or conference proceedings. In this stage, 400 articles were identified.
- In the second round of the search, the focus was narrowed to English-language journal articles published between 2018 and 2024, prioritizing studies that addressed sustainability, which emerged as a critical construct for RQ2. This process resulted in 149 articles.
- In the third round of the search, a detailed full-text review was conducted to confirm direct relevance to brand equity, social media, sustainability, and KBEs, leading to the selection of 33 key articles for in-depth analysis. This helped to extract key data and significant findings from the selected articles. Factors influencing brand equity were identified and extracted from these studies to inform the development of the initial model.

2.5. Bibliometric Analysis

Bibliometric analysis was performed using VOSviewer (version 1.6.18) to map the intellectual structure of the initial 1552 articles. A co-occurrence analysis of keywords, with a minimum threshold of five occurrences and weighting based on citation counts, revealed thematic clusters, including brand equity, social media engagement, and sustainability. Notably, sustainability emerged as a significant theme, associated with corporate social responsibility and green marketing, underscoring its relevance for RQ2. Further bibliometric analyses were conducted on the 149 and 33 article subsets to extract precise factors for RQ2 (e.g., drivers of brand engagement) and RQ3 (e.g., sustainability factors). The resulting network visualizations and cluster analyses are presented in Section 4.

2.6. Thematic Analysis

Thematic analysis was conducted using NVivo (version 12) on the 149 articles to identify recurring themes and constructs. A coding framework was developed, drawing on established brand equity models, such as Aaker’s framework [12], and sustainability frameworks, such as the triple bottom line [13]. Codes were tailored to RQ1 (e.g., “personalized content,” “customer engagement”) and RQ2 (e.g., “sustainability practices,” “brand reputation”).

2.7. Trend Analysis

The Google Trends tool is utilized to better understand thematic trends and changes related to the research’s main keywords. This analysis enables the researcher to monitor interest and temporal changes in topics such as brand equity and social media, providing complementary information for constructing the initial model. Another reason is to complement the literature-based analyses. Google Trends also helped to examine public

interest in keywords (“company,” “brand equity,” “social media”) from 2019 to 2024. Each keyword was analyzed individually, and the data were aggregated using a weighted average approach, with weights based on search volume, to normalize trends. This analysis provided insights into the evolving relevance of brand equity and social media for KBes, supporting the development of the preliminary model for RQ2. Trend visualizations and statistical findings are reported in Section 4.

2.8. Analysis and Preliminary Model Development

After analyzing the collected data, an initial model for enhancing brand equity for KBes through social media was designed. Based on findings from the articles and insights gained from Google Trends, this model was a preliminary framework for enhancing brand equity in KBes.

The systematic review methodology and thematic trend analysis enabled the comprehensive and coherent identification of key factors affecting brand equity. This also supported the scientific and practical development of the research model.

The 33 key articles, combined with insights from bibliometric, thematic, and trend analyses, were synthesized to develop a preliminary model for enhancing brand equity in KBes. The model integrates factors identified for RQ1, such as customer engagement and content personalization, with sustainability constructs for RQ2, including environmental and social responsibility. This approach incorporates social, economic, and environmental dimensions and is presented in Section 4.

2.9. Methodological Rigor

The methodology ensures scientific rigor through the following principles:

- Transparency: All search strings, screening criteria, and analytical processes are clearly documented.
- Replicability: Standardized tools (Scopus, VOSviewer, NVivo) and well-defined protocols enable study replication.
- Validity: Triangulation of bibliometric, thematic, and trend analyses ensures robust, cross-validated findings.
- Relevance: The focus on recent, high-quality articles and emergent themes, such as sustainability, addresses current research needs.

This integrated methodology, combining broad literature mapping with focused analysis of key articles, facilitates a comprehensive identification of brand equity factors (RQ2) and the development of sustainability-integrated research directions (RQ3) in a scientifically robust and targeted manner.

3. Analysis and Findings

To identify the most relevant articles aligned with the research objectives, keywords related to brand equity concepts were first extracted from the Scopus database, followed by keywords related to social media. As illustrated in Figure 1, the articles were analyzed using the VOSviewer software to identify their interconnections. Subsequently, all data related to the articles were analyzed, and relevant data visualizations were created.

In the next step, the keywords brand equity, companies and businesses, and social media were extracted, reducing the number of articles to 400. Three screening stages were conducted to refine the articles further, followed by a qualitative analysis using NVivo software. Finally, the articles were clustered to identify groups relevant to the research question. Using machine learning techniques, the clusters were analyzed. Among the five extracted clusters, clusters 4 and 5 were found to have the highest relevance. These clusters were further analyzed using machine learning tools to extract key articles closely related to

the research questions, resulting in 33 core articles. These articles were thoroughly reviewed to ensure they supported the research objectives.

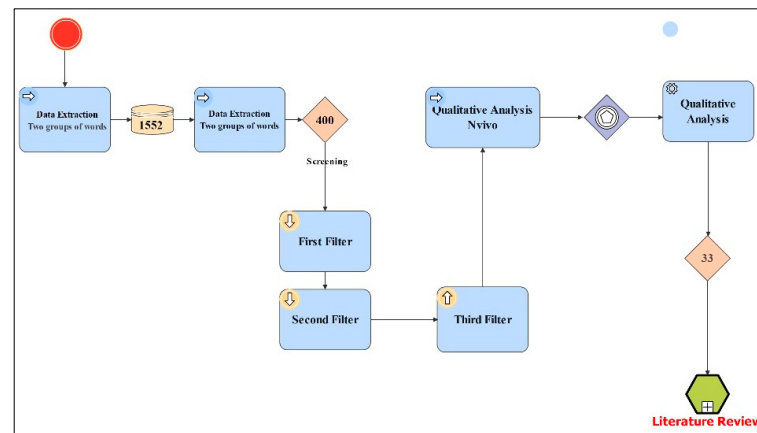


Figure 1. Search and analysis flowchart for the quantitative and content-based review of publications.

3.1. Scopus Data Analysis

3.1.1. Initial Dataset of Articles

A total of 1552 articles were identified as the initial dataset to be analyzed by defining a specific code category and searching for articles from 1994 to early 2024 based on selected keywords. The keywords searched for within the title, abstract, and keywords of the articles [14] included “social media,” “social networks,” “brand equity,” “brand awareness,” “brand associations,” “perceived quality,” and “brand loyalty,” ensuring the extraction of a broad spectrum of credible articles.

After reviewing and analyzing a collection of articles to approach the research objective, keywords including “company,” “corporation,” “knowledge-based company,” “start-up,” and “start-up” were added to the search string. This comparison was conducted to identify differences in keyword searches when combining terms such as “company” and “corporation” and to evaluate their impact on the search results. Based on defining specific criteria for better search outcomes, the timeframe from 2008 to early 2024 was determined, resulting in a total of 400 relevant articles being.

3.1.2. Article Screening and Filtering

Following the complete extraction of articles, a screening process focused on studies directly related to the research topic. Scopus filters were applied, limiting the results to the following:

- Articles published in the last six years.
- Studies written in English for accessibility and review purposes.
- Journal articles, excluding books and conference papers, to maintain focus on scholarly publications.

These filters refined the results to meet the study’s criteria. The Scopus data were analyzed in three stages:

- Articles published from 1994 to early 2024 were extracted and reviewed. Using VOSviewer software, the data were organized and analyzed, creating a bibliographic network that illustrates the key topics studied during this period.
- Interdisciplinary issues and studies were identified and extracted from the data. Subsequently, a network map connecting these topics was designed and analyzed.
- The filtered output data underwent further network analysis using VOSviewer, ensuring the accuracy and reliability of the results.

3.2. Literature Trends and Network Analysis

Research on brand equity in small and medium-sized enterprises (SMEs) and businesses within the context of social media experienced limited progress from 1994 to early 2012, mainly due to a lack of focus. However, the importance of this topic gained traction by 2015. Social media began playing a crucial role in strengthening relationships between enterprises and individual customers, fostering loyalty and effective communication. Enterprises utilize social media to promote customer relations through reputation management, loyalty-building, information dissemination, and reward-based activities [15,16]. Social media positively influences customer relationships, trust, and loyalty, emphasizing its importance for enterprises in telecommunications [17]. Between 2018 and 2020, interest in this area increased, with more research conducted compared to earlier years.

Numerical data from the previous section revealed that from 1994 to 2012, studies on brand equity and social media exhibited minimal growth. As the field approached 2015, a slight increase in research was observed. However, a significant surge occurred from 2019 onward, as shown in Figure 2. The reason for this is partly due to two key factors.

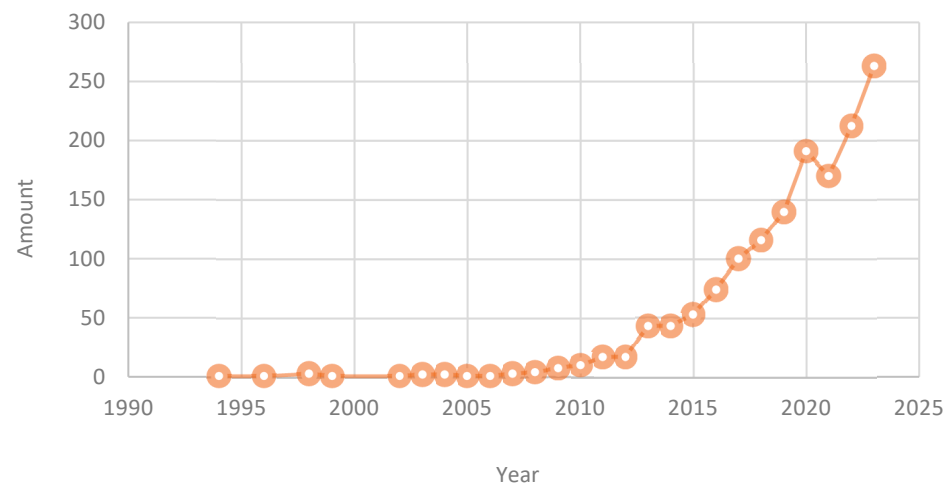


Figure 2. Number of preliminary research studies in the Scopus database from 1994 to early 2024.

The onset of the COVID-19 pandemic transformed public behavior and increased researchers' focus on social media usage. The rapid development and market-driven demand for social media platforms were spurred by the growth of user bases.

The COVID-19 pandemic [18] largely affected social media usage behaviors [19]. A notable rise in social media usage, particularly among students and researchers, was observed during the pandemic [20].

Figure 3a shows that brand equity establishes its primary connections with online social networks. Notably, the strongest links in this section are associated with offers and discounts, as well as digital marketing. Additionally, brand equity is closely tied to brand image and digital marketing.

Figure 3b shows that online social networks, social media, and social networks are directly connected to brand equity, demonstrating the most significant impact. Beyond the relationship with brand equity, brand image and brand [21] communications exhibit the highest levels of connection. Subsequently, brand loyalty demonstrates the strongest connections with social networks.

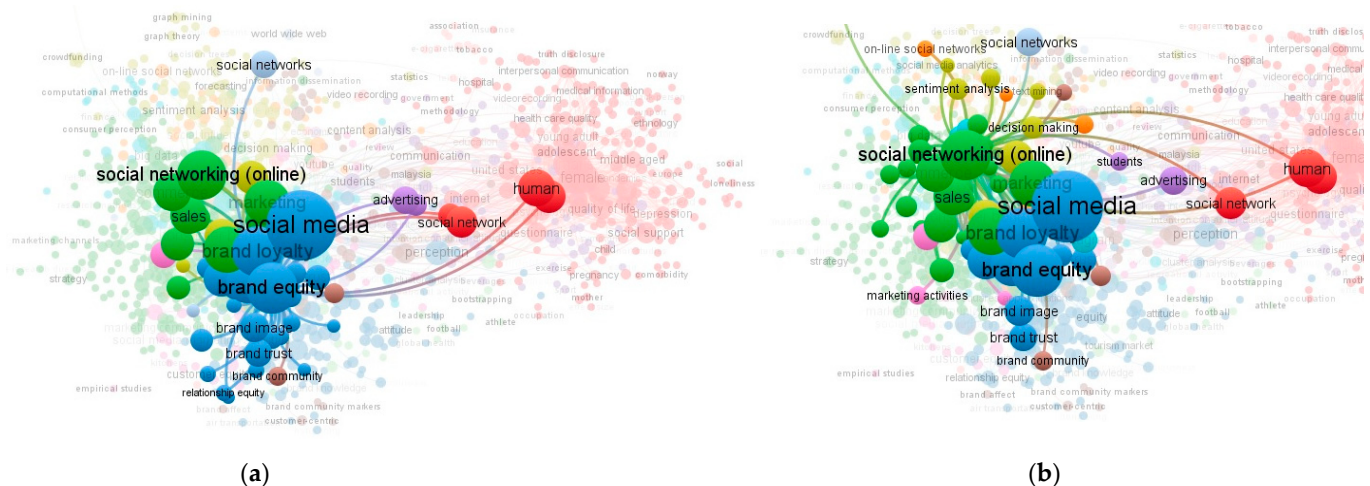


Figure 3. Keyword network analysis (1994–early 2024): (a) brand equity, (b) social networks.

Based on the Scopus data analysis, one key finding from Figure 3 is the significant increase in research focus on digital marketing in recent years, particularly as the year 2024 approaches. This trend reflects businesses' growing recognition of the critical role digital marketing plays in today's world. As 2024 nears, studies and research in digital marketing expand rapidly.

As observed in the network presented in Figure 4, it can be concluded that as the year 2024 approaches, studies increasingly shift toward digital marketing. This area has established a strong connection with brand equity and social networks. Furthermore, interdisciplinary research in recent years suggests that digital marketing and the use of social networks will become prominent and innovative solutions in the field of marketing in the future.

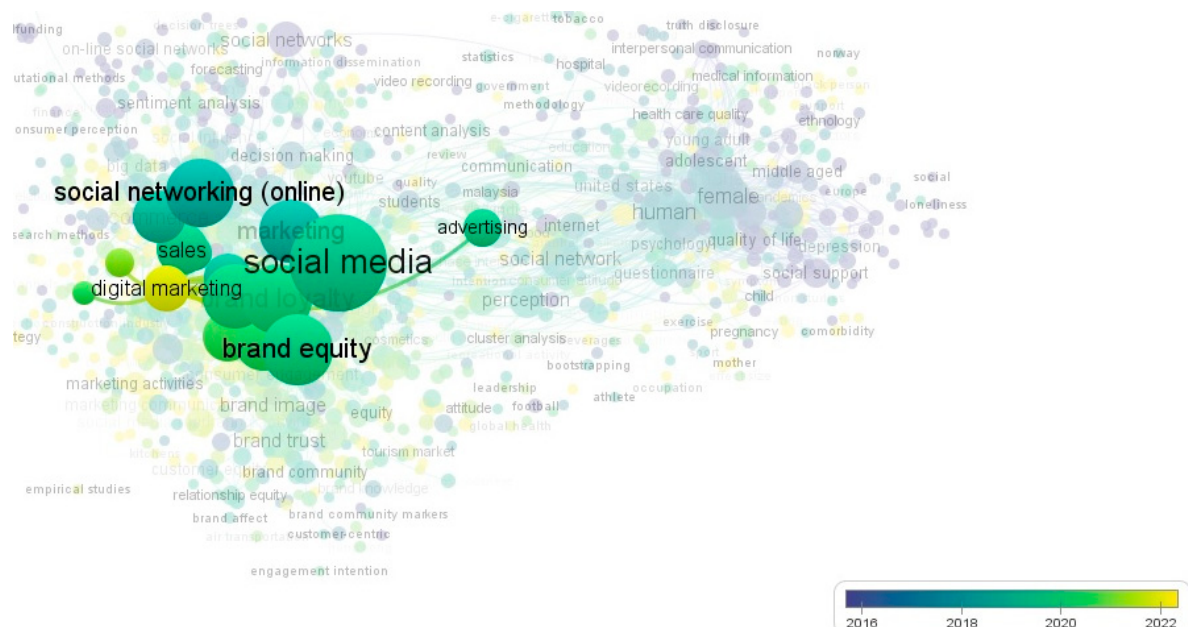


Figure 4. Initial communication network from 1994 to early 2024, centered on brand equity with a focus on the time period.

Digital transformation and social networks significantly enhance brand equity by strengthening customer engagement and fostering co-creation [22]. Digital transformation, through social media interactions, impacts brand equity by increasing electronic word-

of-mouth (e-WOM) and product engagement, as found in 2023, highlighting its ongoing relevance into 2024 [23]. In 2024, the continued integration of digital technologies and social networks are central to shaping brand valuation strategies and fostering meaningful customer relationships.

Figure 5 shows that there are 882 articles related to business, management, and accounting, followed by computer science with 432 results and social and behavioral sciences with 397 results. These statistics can help researchers and professionals in these fields identify the best sources and relevant components related to brand enhancement and branding through social media for KBEs, enabling them to utilize these resources effectively in their studies and investigations.

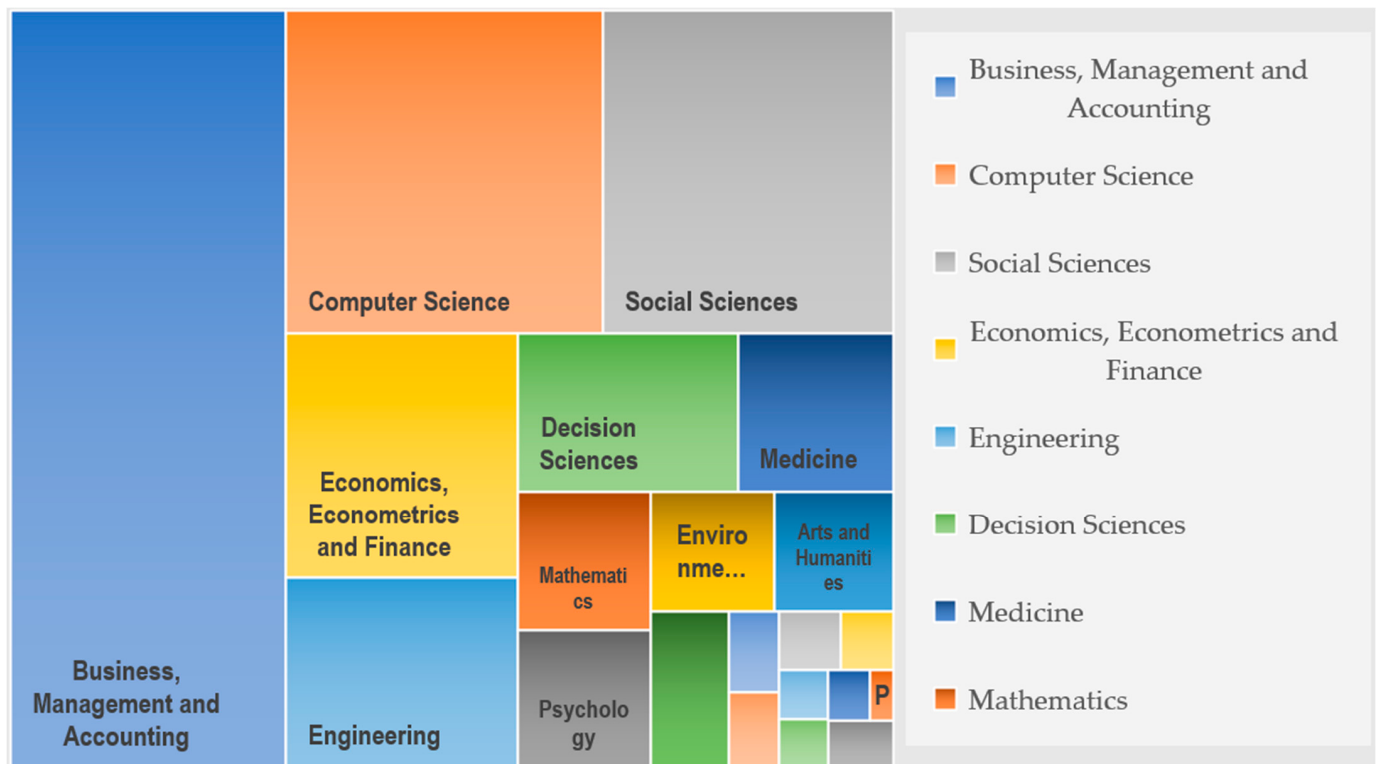


Figure 5. Classification of research areas in the initial phase from 1994 to early 2024.

The growing developments in digital marketing and the prominent role of social media in enhancing market and brand equity underscore the importance of conducting research in this field. According to Figure 6, Islamic Azad University in Iran has gained a prominent position in conducting research derived from the Scopus database by organizing seminars and conferences and carrying out various and diverse studies in these areas. Based on Scopus data, among the twelve top universities in Iran with the highest publications in digital marketing and social media, Islamic Azad University holds the seventh position as a research center in this field. This data indicates that Islamic Azad University in Iran is actively engaged in generating knowledge and conducting research related to digital marketing and social media.

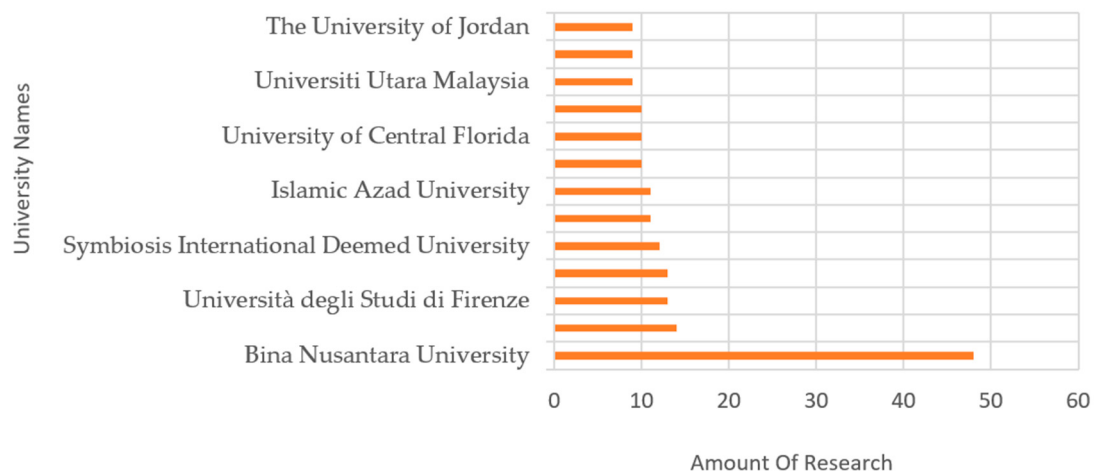


Figure 6. Classification by university in the first two groups from 1994 to early 2024.

Several factors can contribute to the prominence of Islamic Azad Universities. These include the presence of over 400 university branches across Iran; the large number of students, which leads to increased knowledge production in this field; the universities' support for research activities; and a focus on innovation and entrepreneurship.

According to Figure 7, the highest number of results corresponds to journal articles, totaling 1083 results. The following are conference papers with 248 results, book chapters with 139 results, and other types of studies of greater significance than books and other study formats. Based on Figure 8 and the large number of valid academic articles, it is possible to form a more comprehensive literature review in the field [24] of brand equity and social media. However, few studies have been conducted in the area of KBEs and SMEs, although these studies have increased recently.

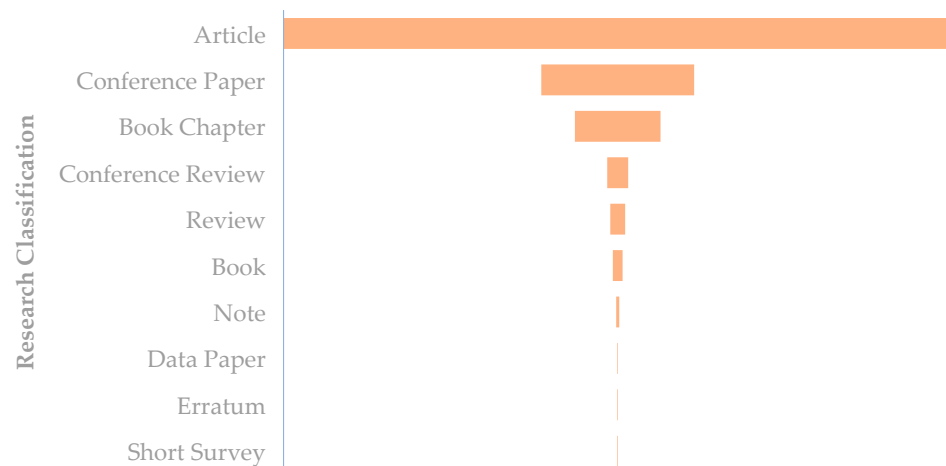


Figure 7. Classification by research type in the first phase from 1994 to early 2024.

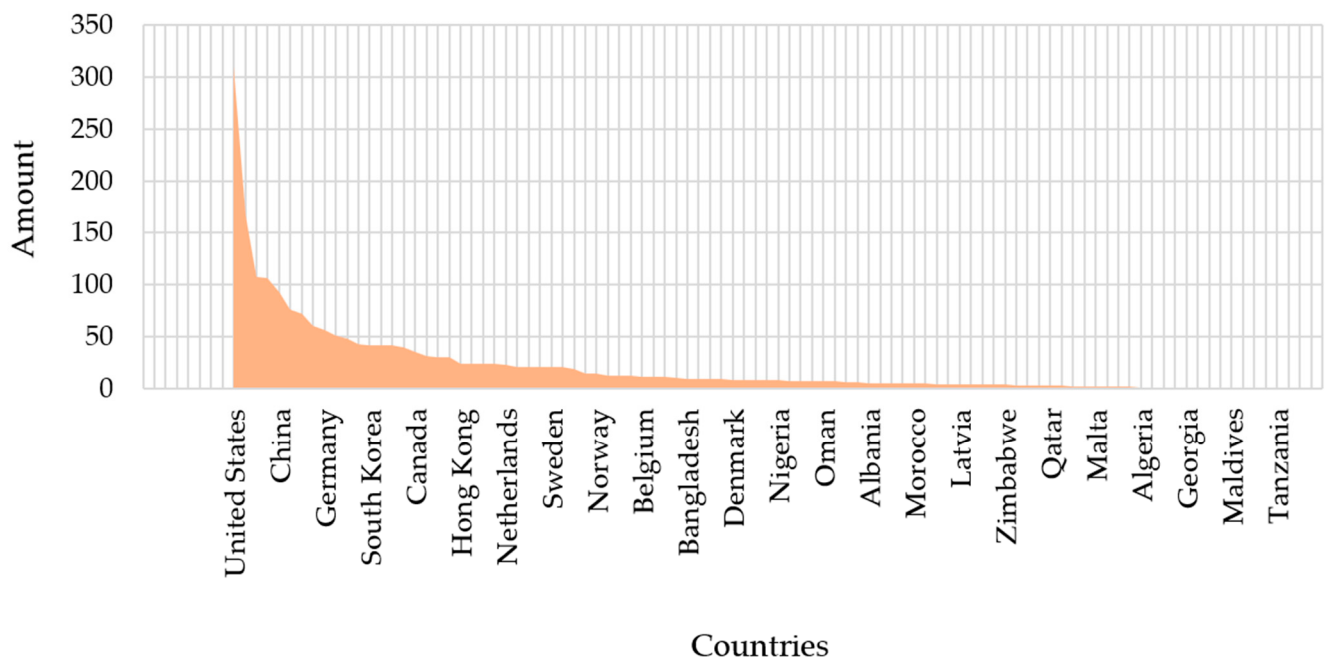


Figure 8. Classification by geographical region of research conducted in the first phase from 1994 to early 2024.

Figure 8 presents statistics on the number of results related to each country based on the search on the databases conducted. These statistics allow a clear view of the geographical distribution of research results related to brand equity, social media, and digital marketing. According to the figure, the United States yields the highest number of results, with a total of 311 studies. Following this, India, with 167 studies; the UK, with 107 studies; Indonesia, with 106 studies; and China, with 93 studies, hold significant positions. Iran, with 39 studies in this field, ranks 24th. It can be concluded that research related to brand equity, social networks, digital marketing, and KBes and SMEs has been conducted in various countries. By analyzing the number of results from each country, we can observe how different nations utilize social networks, adapt to global changes, and create campaigns on these platforms to maintain their companies' and brands' dynamic global position, securing the best markets for selling their products.

3.2.1. Trend Analysis from 2008 Onwards

Although research on brand equity in SMEs began before 2008, significant attention to the topic, particularly about brand equity, social networks, and digital media, emerged in 2012. From 2010 to 2020, there was an intensified emphasis on the integration of digital marketing tools and techniques (DMTTs) with brand equity management for SMEs [25].

Since then, there has been a significant increase in research in this area. The number of studies has increased significantly, reflecting the growing importance of businesses' use of these platforms to enhance their brand. This growth has been upward, particularly from 2019 to 2021. Additionally, after 2022, the digital recovery highlights the strong connections between brand equity and social networks.

Figure 9 illustrates the steady growth in the number of articles published in this field from 2008 onwards. This trend reflects the academic community's growing emphasis on the significance of social media in enhancing a company's brand equity, particularly for SMEs. According to Figure 9, significant growth is observed in the 2012–2013 period, followed by a decline from 2014 onwards. Furthermore, with the onset of the COVID-19 pandemic, the growth rate sharply decreased [26]. However, in early 2024, significant and explosive

growth in research activity was observed, indicating significant shifts in attention and activities related to this area.

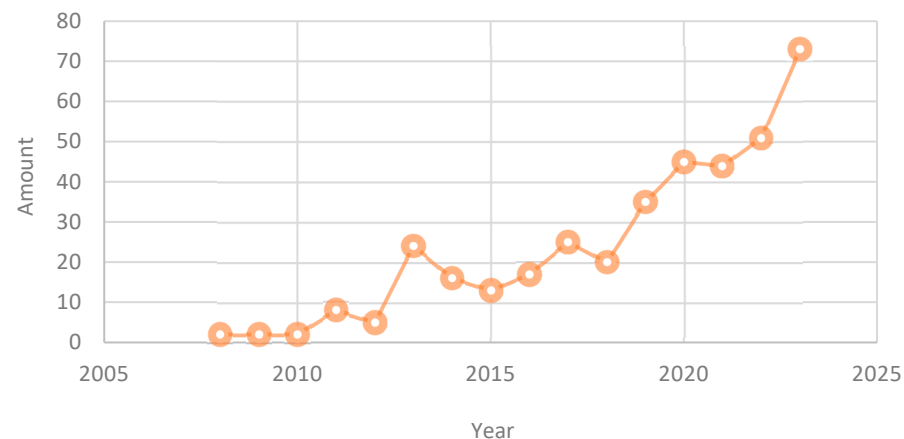


Figure 9. The volume of second-phase research in the Scopus database from 2008 to early 2024.

The search with a designated code resulted in 400 academic articles from the Scopus database, published between 2008 and 2024. These articles primarily focus on brand equity, social media, and companies. The search code used in this phase focused on companies, as it aligns more closely with the research objectives and helps pinpoint articles with the highest relevance to the topic.

Figure 10 illustrates the network analysis of 400 reputable academic articles extracted from the Scopus database. The keywords related to KBEs, businesses, and economic entities highlight the broad connections between these keywords: brand equity, the market, and social networks. The following section further explains case analysis and network visualizations to understand the topic better.

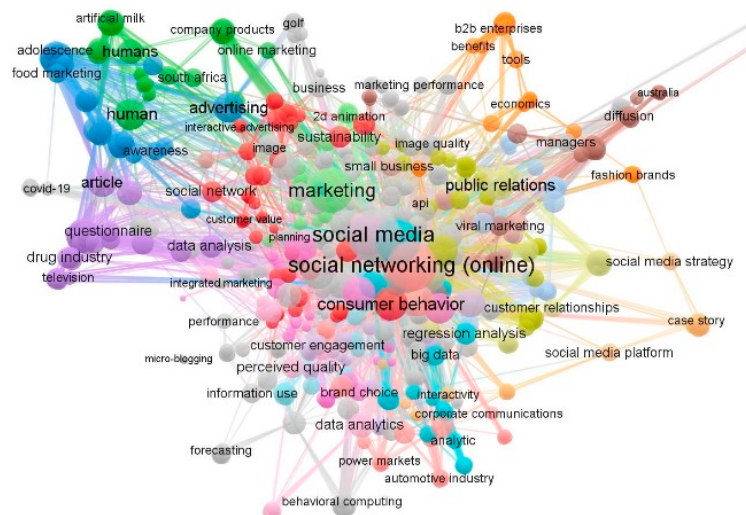


Figure 10. Communication network of three groups from 2008 to early 2024.

Figure 11a shows a detailed network that explores the relationships between brand equity and other related concepts in media, companies, and artificial intelligence from 2008 to 2024, based on Scopus data. In this bibliographic network, brand equity is treated as the central node, and its connections to other key concepts, such as brand image, brand awareness, brand loyalty, SMEs, and media/social networks, are examined over different time intervals. Figure 11a highlights brand equity as the core element of the network. The inner circles of the brand equity network comprise customers, employees, suppliers, and

other relevant companies, while the outer circles encompass stakeholders such as media, social networks, and artificial intelligence.

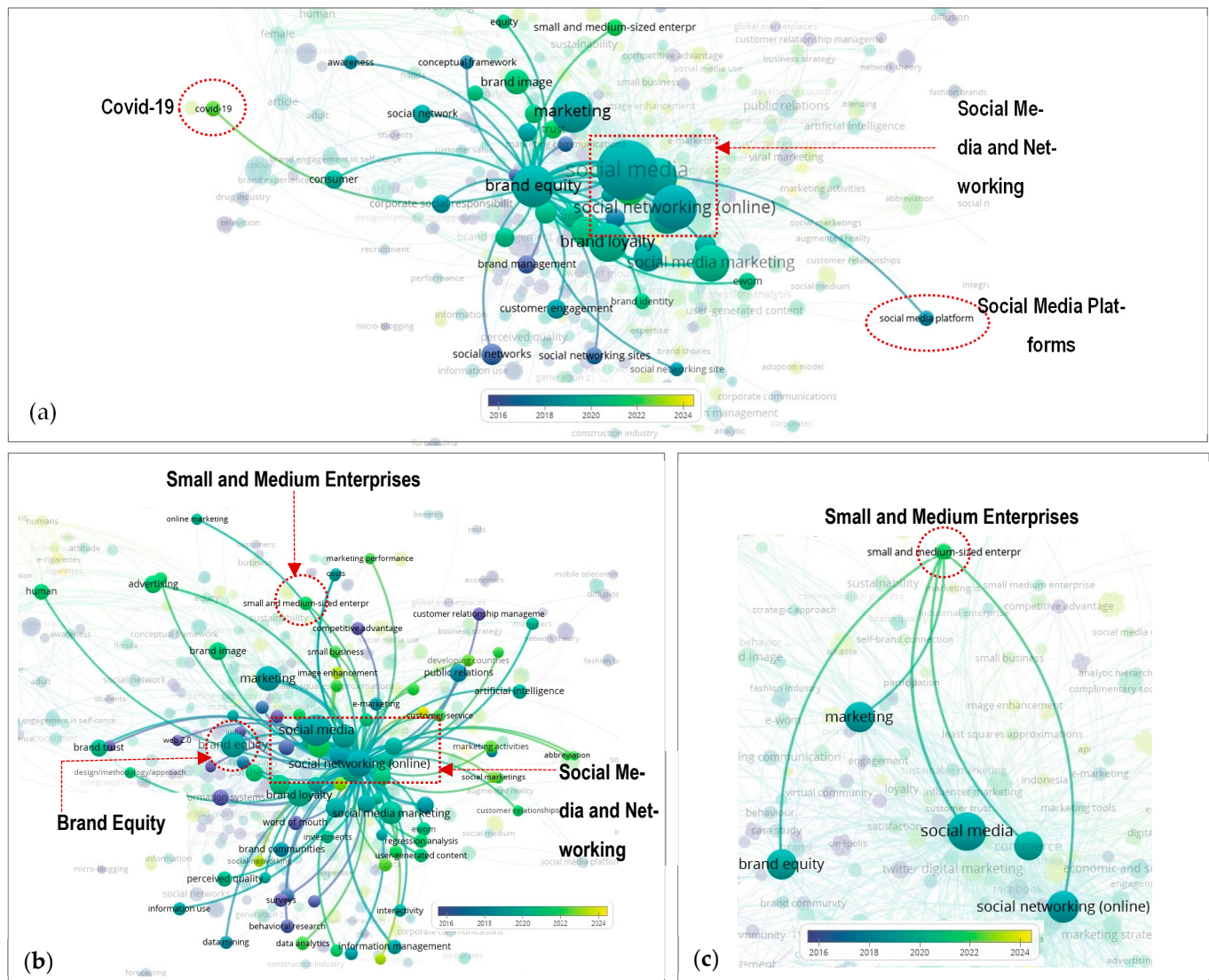


Figure 11. Central network analysis segmented into three focused areas to highlight the temporal connections between concepts: (a) brand equity, (b) social media, and (c) small businesses.

The strong connections between brand equity and concepts like market, companies, SMEs, social networks, brand image, and digital marketing indicate the interdependence of these elements. As shown in Figure 11a, digital marketing demonstrates a strong relationship with brand equity for this network. As we approach 2024, connections between brand equity and companies have gradually strengthened, particularly with SMEs. In the years before 2016, the most significant connections of brand equity were with brand management and customers. After 2019, the media's relationship with brand equity, brand image, and brand awareness grew steadily [27]. From 2020 onwards, digital marketing formed broader connections with brand equity and related concepts.

Figure 11b presents a network diagram illustrating the connections between social networks as the central node and other concepts from 2008 to 2024, based on Scopus data. Social networks are the core element in this bibliographic network, with strong connections to key concepts such as media, brand equity, and companies. The inner circles of the social network encompass artificial intelligence, big data, and data mining, with the most

connections to companies, SMEs, and media platforms, including Instagram, Facebook, and Twitter. The outer circles contain brand equity, brand image, brand awareness, loyalty, and digital marketing, with the most significant interconnections. This visualization offers a comprehensive view of the relationships between social networks and other key concepts in business and marketing.

Figure 11c presents a network diagram focusing on companies as the central node and their connections to other concepts in the business and media domains from 2008 to 2024, based on the 400 articles from Scopus. As shown in the diagram, strong connections between companies and concepts such as brand equity, social networks, and media illustrate the synergy and interdependence of these elements. These relationships have significantly increased since 2022, with growing connections as we approach 2024. Notably, companies now have the most direct connections with brand equity and social networks, indicating the expanding importance of these relationships in contemporary business dynamics.

Figure 12 presents an overview of the relationships between the core concepts of the research. This figure depicts various layers, with the most significant connections at the center of the network, representing social networks and social media [14]. The first layer encompasses social media, social networks, big data marketing, and other related platforms. This layer refers to the digital world's primary concepts and communication platforms. Social media platforms, such as Instagram, are used as key tools for engaging with audiences and advertising in the online world. Social networks also help facilitate access to specific communities of customers and brand advocates. Based on large-scale data analysis, big data marketing enables the optimization of marketing strategies.

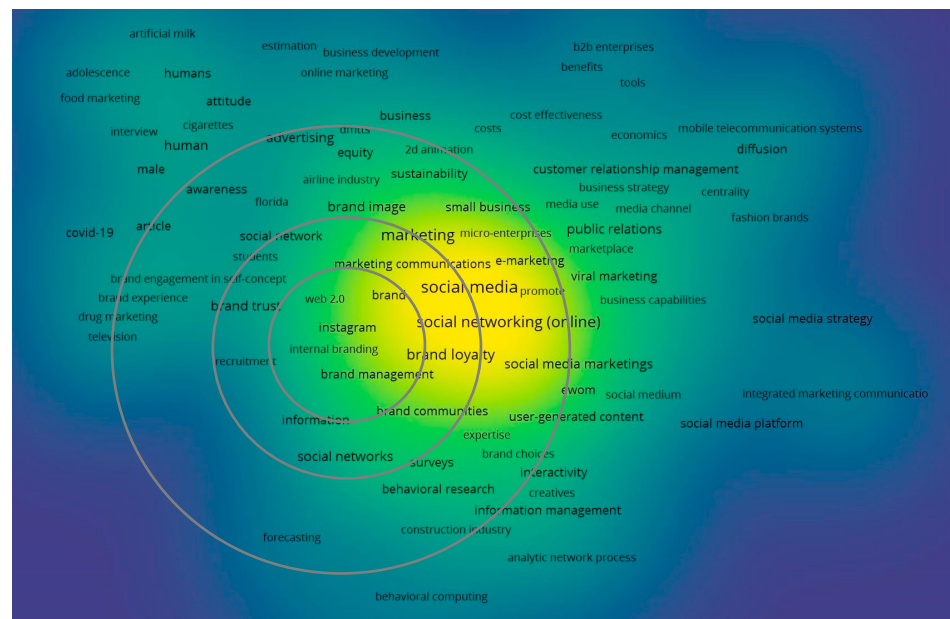


Figure 12. Heatmap of thematic trends grouped within circular focus areas in the selected literature from 2008 to 2024.

The second layer encompasses brand equity, brand management, Instagram, the market, digital marketing, e-marketing, and other related areas. This layer focuses more on branding and marketing-related concepts. Brand equity refers to a brand's [28] unique characteristics and advantages that differentiate it from competitors. Brand management involves strategic engagement with brand value and its communication with audiences. As one of the most widely used social media platforms, Instagram [29] plays a central role in

brand management [24] and digital marketing. The market and digital marketing concepts relate to market research, online strategies, and digital advertising.

The third layer encompasses online platforms, media strategies, and artificial intelligence, among others. This layer pertains to advanced technologies and technical solutions in marketing and branding. Online platforms encompass websites, online stores, and apps that brands use to interact with and sell to their audiences. Media strategies and artificial intelligence use algorithms and advanced analytics to improve marketing performance and audience engagement. These data underscore the importance of media and business studies and the integration of these fields with computer science and software development, highlighting the key role of interdisciplinary research in these areas. Figure 12 presents a heatmap showing the distribution of themes and keywords, with lighter colors indicating higher topic concentration. The circular outlines roughly group sets of words and concepts that most likely emerged during the selected time periods.

As observed in Figure 13, Islamic Azad University in Iran has achieved a prominent position among researchers in these fields through extensive and diverse research. This is evident from an analysis of data from the Scopus database. According to Scopus data, Islamic Azad University ranks seventh among the top ten universities in Iran with the most publications in digital marketing and social media. This reflects the large number of its branches nationwide and the wide range of academic programs it offers.

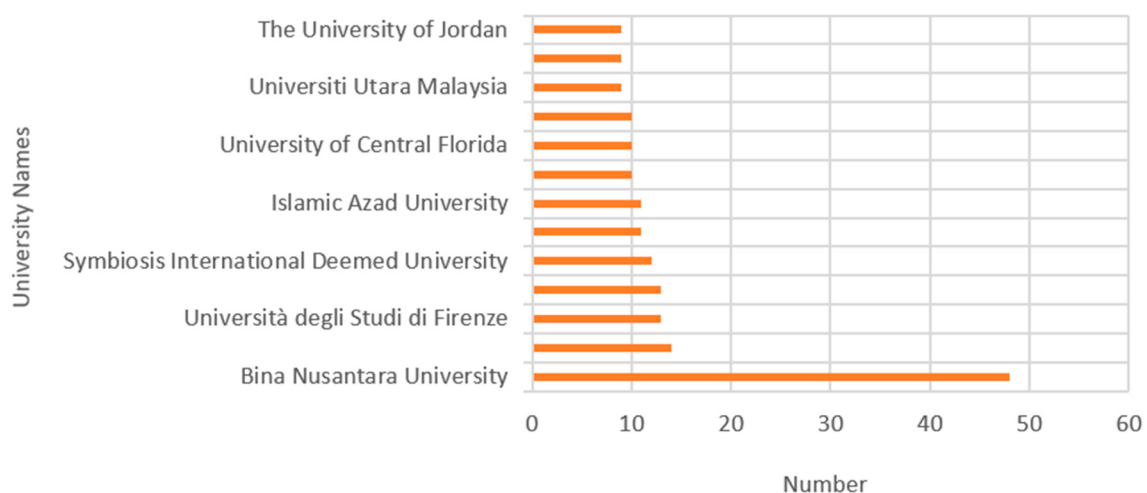


Figure 13. Classification by university in three groups of keywords from 2008 to early 2025.

Several factors contribute to the superiority of Islamic Azad University, including its over 400 branches across the country, a significant increase in student numbers that boosts knowledge production in this field, the support universities provide for research activities, and a focus on innovation and entrepreneurship.

As shown in Figure 14, most results based on the type of research publication belong to articles, accounting for 62.3% of the total results. Following this, conference papers make up 19.5%, and book chapters account for 11.8%. Other types, such as books and reports, comprise a smaller portion of the results. Based on these outputs, peer-reviewed journal articles can be considered a reliable source for reviewing relevant studies due to their greater focus and extensive growth.

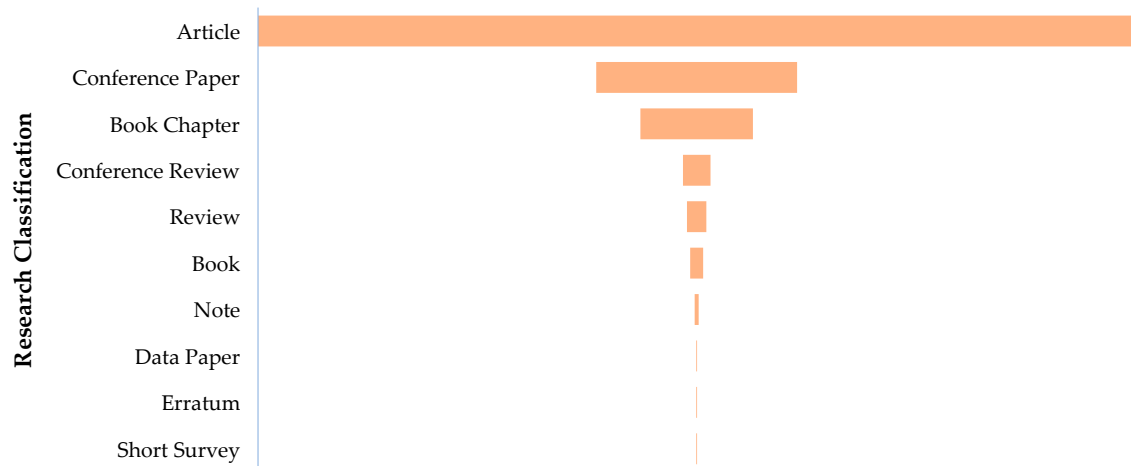


Figure 14. Classification by research type in the second phase from 2008 to early 2024.

Figure 15 presents statistics on the number of results related to each country based on the research conducted. This data is used to analyze the geographical distribution of research results related to brand equity, social media, and enterprises. The United States has the highest number of results, with a total of 78. India follows with 33 results, Indonesia with 32, and China with 23 results. Iran ranks 23rd with nine results.

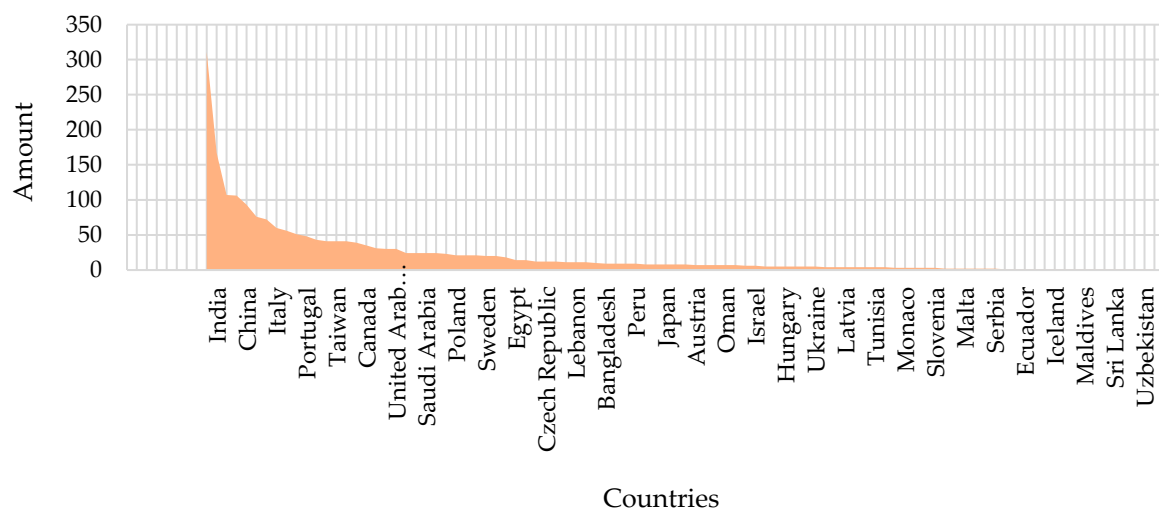


Figure 15. Classification by geographical region of research conducted in the second phase from 1994 to early 2024.

These findings suggest that brand equity holds a prominent position in countries such as the United States and India, largely due to their leadership in high-tech companies. In countries such as Indonesia, China, and the United Kingdom, the importance of media in enhancing brands is more pronounced. In developing countries, the number and growth of research outputs indicate a rising trend driven by increasing international market presence.

3.2.2. Brand Equity, Sustainability, and Social Media

The 149 valid scientific papers extracted from the Scopus database between 2018 and 2024 were reviewed using the specified code string. These papers primarily focus on topics related to brand equity, social media, and businesses. The search code string used in this phase was selected with a focus on businesses. This choice was made to align more closely with the research objectives and to identify articles most relevant to the topic. Key

filters were applied to the 400 outputs from the second stage. These filters included the desired years, with the last six years being considered. The following filter focused on journal articles, excluding books and conference papers. Finally, the language filter ensured that only English-language articles were considered for better comprehension and more accurate results.

According to Figure 16, since 2019, social media and digital platforms have experienced exponential growth, enhancing brand equity among SMEs. This trend [18], confirmed by researchers and analysts in the Scopus database, has accelerated.

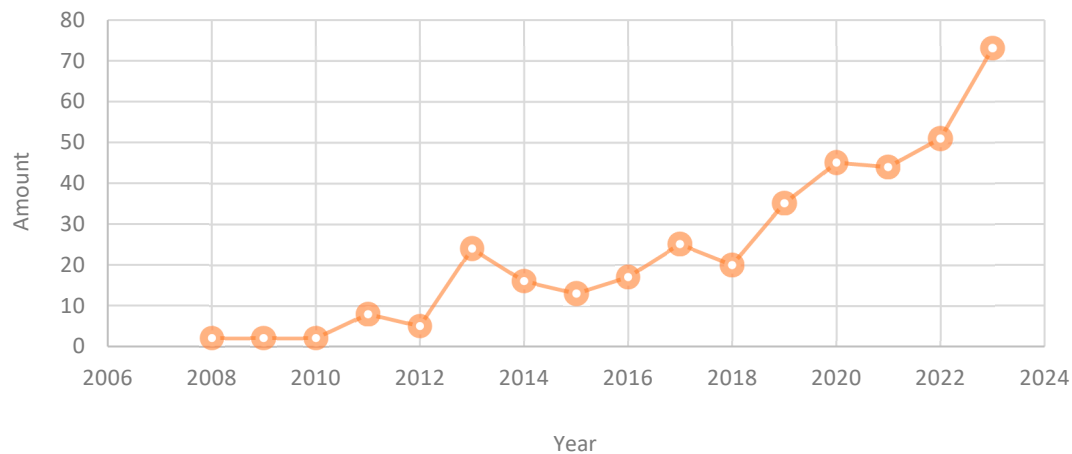


Figure 16. Volume of third-phase research with time filtering applied from 2018 to early 2024.

Before 2018, the use of these tools to enhance brand equity was on the rise, but the pandemic magnified their importance and necessity. Recognizing this trend, KBEs leveraged the potential of social media and digital platforms [30] to establish closer connections with their audiences. These active engagements increased brand awareness, enhanced customer loyalty, improved brand positioning, and ultimately enhanced brand equity.

As shown in Figure 16, the number of published articles has increased steadily since 2018. This signifies the growing importance that the academic community places on the role of social media and digital platforms in enhancing brand equity for companies and SMEs.

The gradual increase in published articles from 2018 to 2021 reflects the growing academic interest in this subject. Following 2021, there is a notable increase in the number of publications in this area, reflecting the growing importance that companies and researchers attribute to the role of social media and digital platforms in marketing and branding. From 2020 onward, there is a sharp increase in published articles, with a surge in online activity.

As shown in Figure 17, between 2018 and 2024, brand equity, brand awareness, brand identity, brand loyalty, and branding were most closely associated with B2B companies and businesses. Brand equity and businesses had the most significant connections with social media. Furthermore, brand awareness and brand loyalty were also linked with digital marketing. The market and discounts were closely related to social media and business activities, further emphasizing the connection between social media and brand equity.

Figure 17 highlights the increasing integration of diverse sustainability variables within the current literature. At its core, corporate social responsibility (CSR) stands as a fundamental concept inextricably linked to sustainable development, primarily aligning with SDG 8 (Decent Work and Economic Growth) and SDG 12 (Responsible Consumption and Production). In social media, CSR communication has become paramount, with enterprises or SMEs using platforms to showcase ethical practices, green behavior, environmental initiatives, and community engagement while simultaneously facing increased public demands for accountability from online consumer movements.

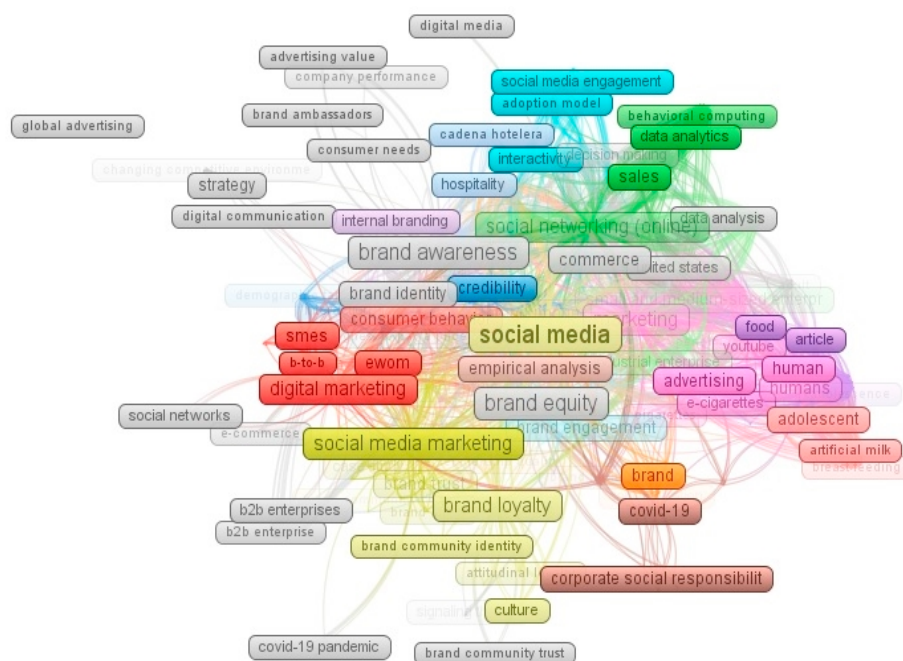


Figure 17. Communication network of the third phase of searches with time filtering applied from 2018 to 2024.

Extending this to the sustainability variable, critical factors like public health, exemplified by global crises such as COVID-19, are deeply interwoven with SDG 3 (Good Health and Well-being). Social media can be very important in disseminating health information, coordinating public responses, and reducing misinformation during pandemic situations. Furthermore, evolving consumer behavior concerning waste reduction and embracing the circular economy directly contributes to SDG 12 (Responsible Consumption and Production) and other environmental goals like SDG 13 (Climate Action).

Social media platforms are key drivers of these shifts to educate, inspire, and mobilize consumers toward more sustainable products, purchasing, and lifestyle choices. Finally, the pervasive influence of culture acts as a foundational variable for the broader achievement of the SDGs, particularly impacting SDG 4 (Quality Education), SDG 11 (Sustainable Cities and Communities), and SDG 16 (Peace, Justice, and Strong Institutions). As shown in Figure 17, culture is another emerging variable that facilitates the dissemination of traditional ecological knowledge and can reinforce or challenge societal norms, thus playing a critical role in shaping collective attitudes and behaviors toward a more sustainable future. In essence, these sustainability variables, significantly shaped by the dynamics of social media, collectively address RQ3, since they are responsible for achieving SDGs.

3.3. Google Trends Data Analysis

Google Trends was utilized as a complementary tool to bibliometric and thematic analyses to investigate global and regional trends in user interest toward brand equity and social networks. This approach aided in identifying key factors for RQ1 (factors influencing brand equity in social networks) and enhancing sustainable development for KBEs. The keywords “company + brand equity + social network,” combined using the “+” operator, were searched globally over the period from 27 October 2019 to 27 October 2024. Data were exported as a CSV file, and a composite Interest Score (ranging from 0 to 100) was visualized as a line graph, as shown in Figure 18. The graph reveals relative stability (mean of 71.5, standard deviation of 6.2), with a slight decline of 5 units since 2022.

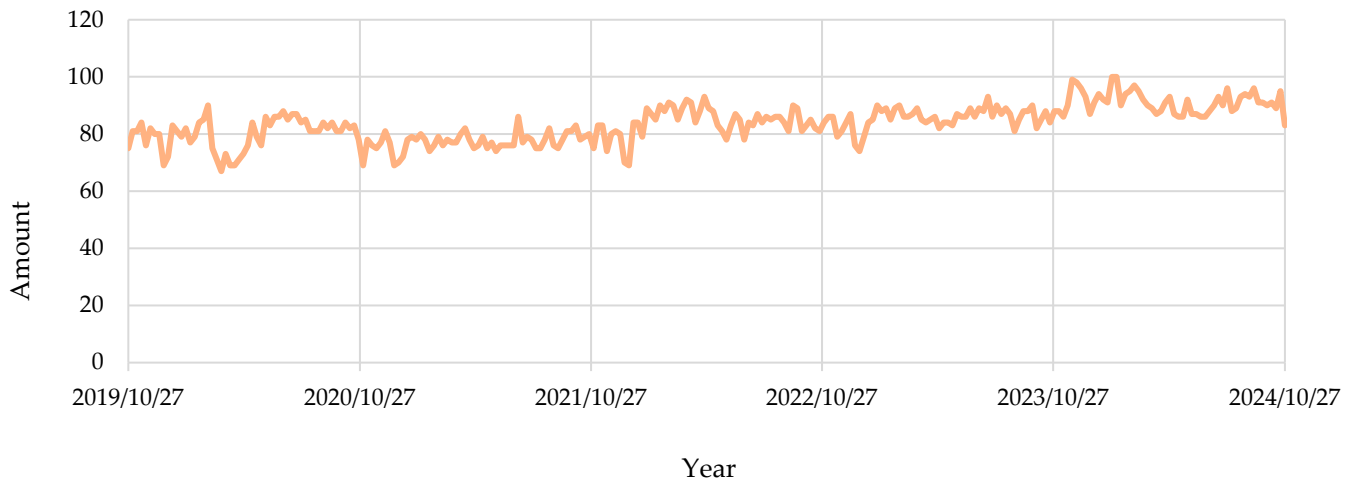


Figure 18. Global trends in search interest for brand equity and social networks on Google Trends (2019–2024).

This study used Google Trends data to examine users' search trends between 2019 and 2024. The data was collected using the keywords "company + brand equity + social network." This keyword combination reflects users' global interest and search frequency concerning brand equity, social networks, and businesses.

Initially, the users' search data across the globe was analyzed. This analysis reveals the geographical distribution of searches, identifying the countries with the highest search volume for these topics. As shown in Figure 18, the search trend related to these topics has been increasing over the past five years, peaking in 2021. This trend signifies the growing attention of users toward issues surrounding brand equity and social networks globally. As we approach 2024, a notable increase in search activity is evident.

In this study, the topics that have attracted the most global attention include the names of companies and organizations. Additionally, business and management are other key topics that have garnered the highest search volume in Google Trends. In Figure 19, we display the top five topics, selected based on the chosen keywords, to provide a better understanding [31] of the importance of these subjects. This selection helps clarify users' informational priorities and their level of attention to issues related to brands, companies, and management on social media.

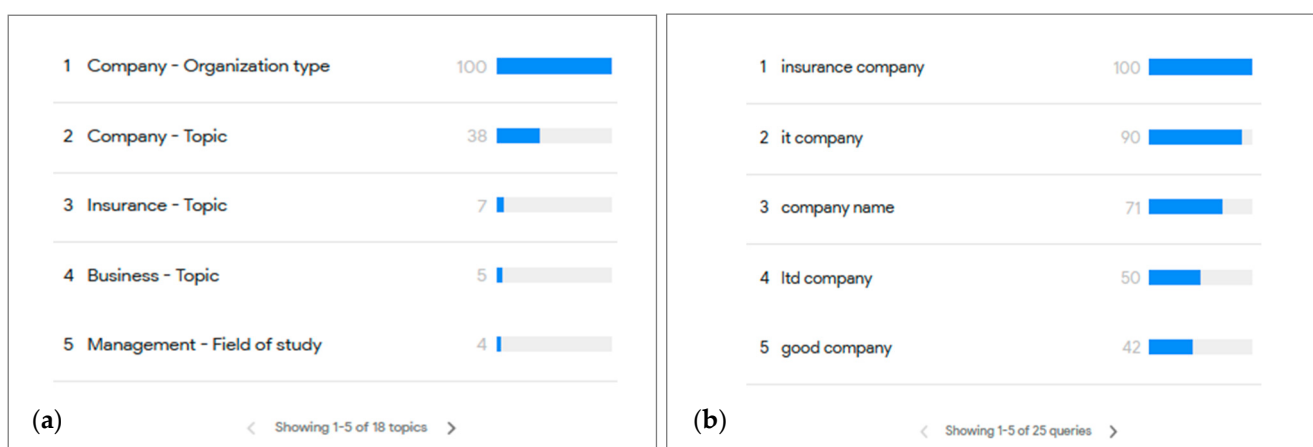


Figure 19. Google-based trend analysis from 2019 to 2024. (a) The outcome of the top search terms on Google. (b) High-volume search questions and topics on Google.

Figure 19 presents the most frequently searched phrases and questions by users. This analysis reveals that most users' queries focus on types of companies, particularly information technology companies and leading companies. This pattern highlights the significance of the brand and its role in the success of businesses from the users' perspective, with a particular inclination toward learning about the brand and services of top and technology-driven companies.

An analysis of Google Trends data was conducted to evaluate the global geographical distribution of interest in the concept of brand equity, focusing on the keyword "brand equity" from 2019 to 2024. The findings are presented in Figure 20 (Global distribution of interest in brand equity on Google Trends, 2019–2024). This analysis was performed at a global level with the "Business" category filter applied, revealing that the United Arab Emirates (interest index: 100), India (89), Qatar (88), Singapore (76), and Nepal (74) exhibit the highest levels of interest in this topic. These patterns may be attributed to economic factors, such as rapid market growth in the Middle East, and advanced digitalization in Singapore and India.

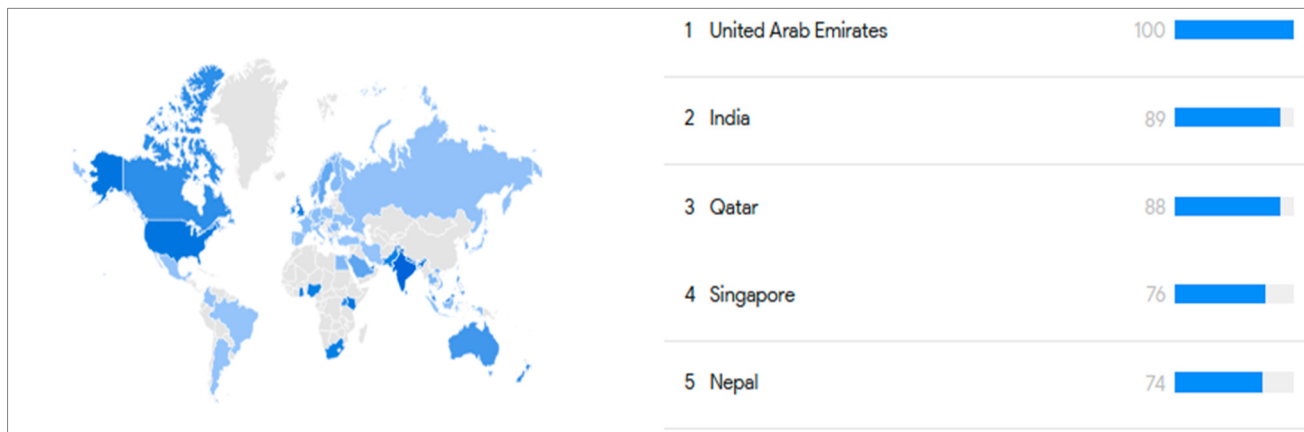


Figure 20. Distribution of topic searches across different countries from 2019 to 2024. Note: Darker shades of blue indicate a higher level of research interest in that country.

An analysis of search frequency based on geographic location worldwide, shown in Figure 20, indicates that the United Arab Emirates, Qatar, Singapore, India, and the United States have the highest research and search volumes in branding and social networks. These data demonstrate the increasing attention of users to brand-related topics globally.

The growing trend of searches in this field underscores the necessity and importance of research on enhancing brand equity through social media. In today's world, where brands are recognized as key assets for businesses, accurately understanding these trends can help companies develop more effective strategies to strengthen their online presence and enhance the credibility [32] of their brands.

4. Review of Key Directions

This section reviews the literature to provide the study's context in detail and introduce relevant directions. Then, the key factors influencing brand equity are revised in Sections 4.2 and 4.3 to inform the RQ2. The role of sustainability in developing a branding model for knowledge-based companies is presented in Section 2.4 to inform RQ3. This section categorizes the existing literature into three main themes through a synthesis analysis: brand equity and its factors, brand communities on social media, and sustainable development in branding. Ultimately, identifying research gaps underscores the necessity of the present study.

4.1. Contextual Background, Branding Strategies, and Performance Measures

A paper by Miller [33] examines the impact of social media and various marketing strategies on brand value. A study focusing on the United States reveals that the effective use of social media platforms can contribute to increased awareness, image, loyalty, and, ultimately, brand equity in the chosen context. Direct communication between brands and consumers on social media helps build trust and emotional connections. The research employs a desk study method, which involves collecting data from existing sources and previous studies. The results indicate a significant and positive correlation between social media marketing efforts and brand equity. Engaging content and effective interactions with consumers strengthen this relationship, and the impact of marketing strategies depends on various factors, such as the business sector and the customer segments, or groups. The paper recommends conducting some in-depth investigations to extend the theoretical understanding of the factors affecting brand equity while considering the role of social media. It also suggests that businesses are interested in employing a comprehensive approach to social media marketing, along with relevant strategies that emphasize the ethical use of social media marketing techniques [33].

Another paper investigates whether social media marketing could affect some key measures, such as brand loyalty [34], with the primary goal of identifying key elements influencing brand loyalty through this type of marketing. The researchers examine the roles of personalization, content quality, and influencer marketing in building brand loyalty and the impact of community management and targeted advertising on brand engagement and experience. The research method includes semi-structured interviews and content analysis, with data collected from 20 active social media users. The results show that content personalization significantly enhances engagement and emotional connection with the brand. High-quality content and targeted advertising positively impact brand loyalty, while effective community management further strengthens it. The study suggests that brands should continuously focus on content personalization and quality, leveraging credible influencers to build consumer trust and emotional commitment. Active community management and consumer engagement are key strategies for enhancing brand loyalty [35].

Another article examines whether social media marketing affects brand loyalty activities in the insurance industry, primarily identifying and analyzing key factors that influence this domain. The authors use quantitative and descriptive research methods, collecting data from 384 social insurance customers in Kermanshah Province. The results indicate that marketing activities positively and significantly impact brand loyalty. Additionally, the mediating role of brand awareness [36] and perceived value is confirmed, meaning that increased marketing activities enhance customer awareness of the brand and its value and may lead to greater loyalty [37]. The study recommends that organizations consider social media as an effective strategy to strengthen customer relationships and increase brand loyalty [38]. It also encourages further research into social media marketing activities across different industries. Policymakers are advised to monitor and measure the importance and value of social media in their marketing strategies and develop supportive policies accordingly [39].

One article examines the significant changes social media has brought to the interactions between brands and consumers. The research shows that social media has not only revolutionized communication methods, but also has a significant effect on consumer behavior and brand reputation. With increased access to information and user opinions, consumers have greater power in decision-making, and brands must adapt to these changes to gain user trust. This empirical study was conducted with 210 respondents, utilizing data analysis methods, including frequency distribution and pie charts. The results show that

85% of respondents are willing to make direct purchases through social media, and 82% believe that social media opinions can influence purchasing behavior.

Additionally, 87% expect two-way interaction with brands, and 89% believe that social media helps reach new customers. The outcome suggests that brands implement two-way interaction strategies to communicate effectively with consumers and strengthen trust. Other recommendations include paying attention to social media data analytics, leveraging influencers to increase brand recognition, and managing online reputation to respond quickly to negative feedback. These actions can help brands remain competitive digitally and build strong customer relationships [40].

A study by Gupta et al. [29] examines the impact of online brand communities on creating online customer engagement (OCE) and fostering brand loyalty. The research includes a survey of 488 social media users. It examines the impact of a specific digital platform [41] features on customer engagement and loyalty, including website satisfaction, efficiency, response time, and entertainment [41] aspects of online brand communities. The results show that the features of online brand communities significantly influence customer engagement [42]. Specifically, website satisfaction notably impacts both engagement and brand loyalty.

Additionally, online customer engagement positively affects brand loyalty. The effect of gender has been examined in previous studies [41] that found that website satisfaction does not significantly impact brand loyalty among female customers. At the same time, the results are similar for both men and women [29]. Another publication explains the concept of consumer engagement with brand communities on social media and proposes a multidimensional engagement model that covers cognitive, emotional, and behavioral factors [43].

Using an online survey method and a sample of 364 respondents in the Republic of Korea, the research tests the multidimensional engagement model in the context of brand-hosted communities. The study's structural equation modeling (SEM) results support consumer engagement as a three-dimensional construct. The study also shows that brand and product participation positively influence all three dimensions of consumer engagement, ultimately leading to increased brand loyalty [44].

This research shows the important role of social media in increasing brand awareness. The study demonstrates that social media platforms are increasingly expanding and have captured a significant portion of the global web space. Platforms like Facebook have even penetrated poor and remote areas. For example, Africa has over 100 million active Facebook users, representing 50% of the population with internet access. This indicates potential opportunities for businesses to connect with prospective customers, and ignoring this could be a major marketing mistake. Social media has become essential for companies seeking to increase brand awareness. As a result, techniques for leveraging these platforms to attract customers have become increasingly complex. In an era where the average internet user checks their social media accounts more than 14 times daily, companies cannot afford to be absent from this space. This study aims to introduce the role of social media and its features and investigate how these elements can be utilized to enhance brand recognition [45].

Another study examines the impact of social media marketing on enhancing brand awareness, brand image, and purchase intention. Particularly during the COVID-19 pandemic, when many countries imposed restrictions on physical businesses, the importance of using digital and social media as effective marketing strategies was emphasized. The study employed SEM with empirical data, including 331 active social media users in Indonesia who had used these platforms for at least two years and purchased products marketed through them. According to the findings, activities in social media marketing that are centered on entertainment, interaction, timeliness, customization, and word-of-mouth

marketing have a good impact on brand awareness, brand image, and the intention to purchase [46].

Finally, an article examined the impact of marketing on brand loyalty through social media channels, employing a qualitative approach to gain a deeper understanding of the factors influencing customer engagement and commitment. This research involved semi-structured interviews with 20 active social media users and content analysis, which identified several key elements. One of the primary conclusions is the significance of content personalization, which can enhance users' emotional affinity with brands. Superior content featuring captivating pictures and insightful information enhances favorable brand perceptions and cultivates loyalty. Influencer marketing additionally bolsters brand reputation and trustworthiness. Effective community management, which includes active engagement, providing feedback, and fostering positive relationships, enhances the user experience and loyalty. Targeted advertising on social media can support brand loyalty, but excessive or inappropriate advertising should be avoided, as it may lead to user disengagement [35].

4.2. Brand Innovation in the Context of Social Media

Yuan [47] investigates social media's impact on brand marketing innovation. The research introduces new features of marketing methods on social media platforms [24], such as low-cost, high-speed information dissemination and short communication paths. These features may offer key opportunities for brand marketing. Given the widespread use of social media, companies must effectively implement their brand marketing strategies on these platforms. For this purpose, defining clear marketing goals and creating appropriate content based on the specific rules of each platform is essential.

In the context of social media, brand innovation is often referred to as innovation arising from or related to branding strategies that transform existing practices and markets, or replace them in new forms. For example, Nguyen et al. [48] build on Schumpeter's idea of creative destruction, emphasizing that social media brand innovation can result in fundamental changes to established practices and create new trajectories of market competition. The paper examines the role of brand innovation within the context of social media, highlighting how innovative strategies enable firms to differentiate themselves, enhance consumer engagement, and maintain competitiveness. Social media platforms serve not only as communication channels for saving research costs, but also as spaces where the co-creation ecosystem, brand knowledge exchange, and innovation diffusion occur. Brand innovation can be the capacity of a firm to create and deliver new value propositions by leveraging brand identity and consumer interactions, positioning it as a key driver of sustainable growth.

Yuan [47] also emphasizes the importance of enhancing synergy between different social platforms; this synergy helps companies analyze marketing data more deeply and guide these analyses based on user needs. Research shows that optimizing brand marketing strategies through multi-platform collaboration can help companies attract new markets and maximize corporate profits. This approach not only increases market share, but can also enhance the economic benefits of companies. Overall, this research clearly demonstrates how the effective use of social media can contribute to brand marketing innovation [49] and business success in the digital world [47].

Another study examines the role of online social networks (OSNs) in enhancing sustainability awareness as a demand factor in marketing today and proposes a framework for this purpose. The research aims to support the field of computer systems in studies related to sustainable development by analyzing the main research streams and bibliometric variables in this area and identifying a future research agenda. The study employed

the PRISMA approach as a systematic review method for reporting the findings of the selected literature and meta-analysis. Furthermore, content analysis and bibliometric instruments were utilized to locate, select, gather, synthesize, analyze, and assess all published papers related to sustainability awareness through online social networks. This research is necessary because it summarizes and analyzes numerous other publications, presenting a framework with four elements to enhance sustainability awareness through OSNs. The four areas encompass critical success criteria, the evaluation of current tools, the introduction of novel methodologies and theoretical frameworks, and case studies.

The future research challenges for each category in the proposed framework are delineated. The innovation and value of this study lie in its effort to enhance sustainability awareness and sustainable behaviors through OSNs. This expanding domain advocates for societal and cultural transformations to attain SDGs. Through these media-based networks, individuals can learn the repercussions of incorrect behaviors and habits and acquire the skills to cultivate sustainable practices. This approach increases public awareness and can lead to social and cultural behavioral changes crucial for achieving sustainable development goals [50].

4.3. Brand Equity and Its Key Factors

As a strategic asset, brand equity is enhanced through brand awareness, customer loyalty, and digital interactions. Miller [33] demonstrated that social media marketing contributes to brand equity by increasing awareness, enhancing brand image, and fostering loyalty, particularly through engaging content and direct customer interactions. Similarly, Wilson, Johnson [35] emphasized that personalized and high-quality content strengthens emotional engagement with the brand, leading to customer loyalty. Tanaka and Huang [51] investigated the factors influencing brand-consumer engagement on Facebook, with the primary goal of identifying effective content components, call-to-action (CTA) cues, and media richness (such as video, images, and text) that enhance user engagement behaviors. The study analyzed 757 brand posts from a radio station on Facebook over 15 weeks. Data was collected using Facebook analytics tools and analyzed using a negative binomial model. The results of Tanaka and Huang [51] indicate that CTA cues and media richness positively influence consumer engagement outcomes. Specifically, the presence of CTAs has significantly increased clicks, likes, comments, and shares.

Additionally, visual and video content is more engaging for users than plain text. A study recommends that brands actively incorporate CTAs and rich media into their marketing strategies, focusing on visual and video posts to enhance engagement. Further research comparing the effects of different media types on user engagement could provide a better understanding of consumer behavior [52,53].

Faikoğlu [37] confirmed the mediating role of brand awareness and perceived value in reinforcing loyalty, particularly in the insurance industry. These findings are complemented by those of Tanaka and Huang [51], who showed that CTAs and multimedia content (images and videos) improve user interactions on platforms like Facebook. However, Miller [33] noted that the impact of these factors varies depending on the business sector and customer segments, highlighting the need for more detailed investigations.

These factors, including customer engagement, content personalization, and loyalty, directly relate to RQ2, focusing on identifying factors influencing brand equity. However, the literature has scarcely addressed how these factors interact in knowledge-based companies, creating a research gap that the present study addresses.

4.4. Brand Communities on Social Media

Brand communities on social media serve as platforms for two-way interactions between brands and customers, playing a pivotal role in digital branding. Aslam, Hussain [54] found that entrepreneurs leverage social media for identity-building and storytelling, strengthening stakeholder engagement. Muchungu [41] confirmed that digital platform features (e.g., website satisfaction and response time) enhance engagement and loyalty in online communities. Specifically, Pathak and Kaushik [43] proposed a three-dimensional model (e.g., cognitive, emotional, and behavioral) for engagement in brand communities, leading to loyalty. Additionally, Falakh [40] reported that 87% of customers expect two-way interactions with brands, and 85% prefer direct purchases via social media.

These studies highlight the importance of digital interactions in strengthening brand equity, contributing to RQ2. However, multi-platform approaches to optimize these communities, particularly in knowledge-based companies, remain underexplored.

4.5. Sustainable Development in Branding

Sustainability has emerged as a key factor in branding, particularly for knowledge-based companies focused on innovation. Chalmeta and Barbeito-Caamaño [50] proposed a social media framework for raising sustainability awareness, incorporating success metrics, assessment tools, and case studies. The study demonstrates that social media can promote sustainable behaviors and contribute to SDGs. Similarly, Yuan [47] emphasized that sustainable marketing on social media, using content grounded in environmental and social values, drives innovation in branding. However, the existing literature has rarely addressed the integration of sustainability into brand equity models, particularly in knowledge-based companies.

This gap directly relates to RQ3, focusing on developing a preliminary sustainability model and contributing to the literature by informing a proposed model that integrates sustainable development into branding.

4.6. Theoretical Basis of Brand Equity

The conceptual basis of brand equity originates from Aaker's framework. Aaker characterizes brand equity as assets and liabilities associated with a brand, its name, and its symbols. They can enhance or diminish the value offered by a product or service to a company and its clientele [55]. Aaker's framework is widely recognized for contributing to understanding consumer-oriented brand equity. This model highlights the varying effects of brand knowledge on consumer responses to marketing and illustrates how customer perceptions of a brand may affect marketing efficacy [56]. Furthermore, research has demonstrated that various factors significantly impact brand equity, including customer perception, satisfaction, and loyalty. Specifically, customer loyalty significantly and positively impacts brand equity enhancement [57].

Additionally, destination branding valuation models have been developed, highlighting dimensions such as brand awareness [58], physical quality, and brand recognition. These dimensions positively affect trust and loyalty toward the destination brand [57]. By leveraging brand equity, companies can communicate more effectively with their target audience and achieve their business goals [9].

In Aaker's original theory, brand equity is defined through five core brand assets:

- Brand Awareness: The ability and willingness of customers to realize and recall a specific brand among competitors.
- Brand Loyalty: Customers' commitment to repeatedly purchasing products or services and their willingness to defend the brand against competitors.

- Perceived Quality: Customers' perceptions and judgments about the quality of a brand's products or services.
- Brand Associations: Thoughts, feelings, and ideas that customers associate with the brand.
- Brand Commitment: Customers' emotional connections and commitment [32] to the brand motivate them to remain loyal despite price changes or market fluctuations [9].

These five factors collectively represent brand equity in Aaker's model, fostering deeper connections between customers and the brand while increasing interest in the brand's products or services [57].

Aaker defines brand equity as a collection of brand assets and liabilities linked to a brand name and symbol that enhance the overall value of any specific product or service [10]. This model emphasizes the importance of enhancing consumer engagement and perceptions of a specific brand to build brand equity [12,55]. Moreover, Aaker's model highlights the significance of perceived quality as a direct influencer of consumer purchase intent, demonstrating that maintaining high perceived quality positively impacts consumer behavior and reduces tendencies toward brand switching [13].

While Aaker's brand equity model is a foundational conceptual framework as shown in Figure 21, it has some limitations. The academic literature, as shown by Gutiérrez et al. [59], suggests that no single, multidimensional model, including Aaker's, offers a comprehensive and universally accepted method for evaluating brand equity. This highlights the need to consider AI and sustainability in future models. Moreover, a primary criticism is the lack of alignment between its theoretical constructs and a pragmatic, updated, verifiable quantification.

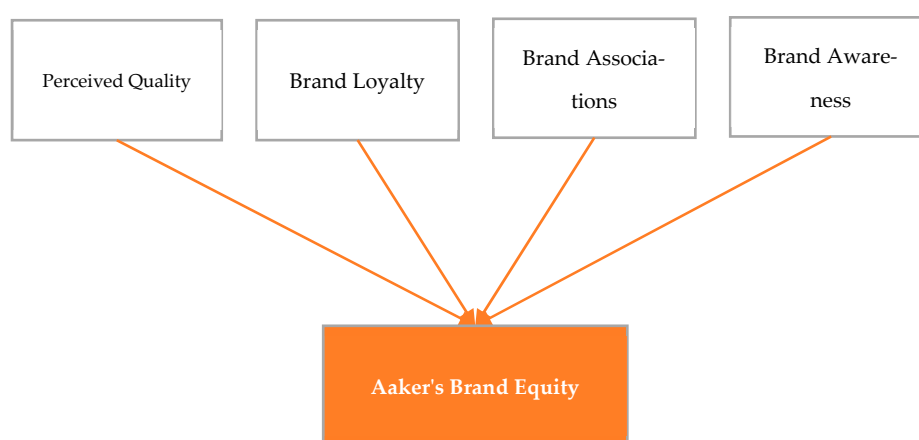


Figure 21. Four key constructs of Aaker's model [13].

The model has also been critiqued for its potential to overlook the nuances of branding messaging in favor of some other components. For example, a more tangible component highlights a persistent gap in the literature between assessing a brand's tangible assets and its intangible value.

Another theoretical model is Smith's Honeycomb model, which offers actionable insights for building engagement and community by understanding the functional role of social media components. It allows social media user behavior and its connection to brands to be analyzed. As shown in Figure 22, the model focuses on seven key elements: identity, presence, relationships, reputation, groups, conversations, and sharing. These elements represent different aspects of users' online interactions with brands and other users on social media. For example, identity refers to how users define themselves and align with the brand, while presence reflects users' activity on social media platforms. This

model is valuable for understanding how social media influences brand perception and value within organizations [60].

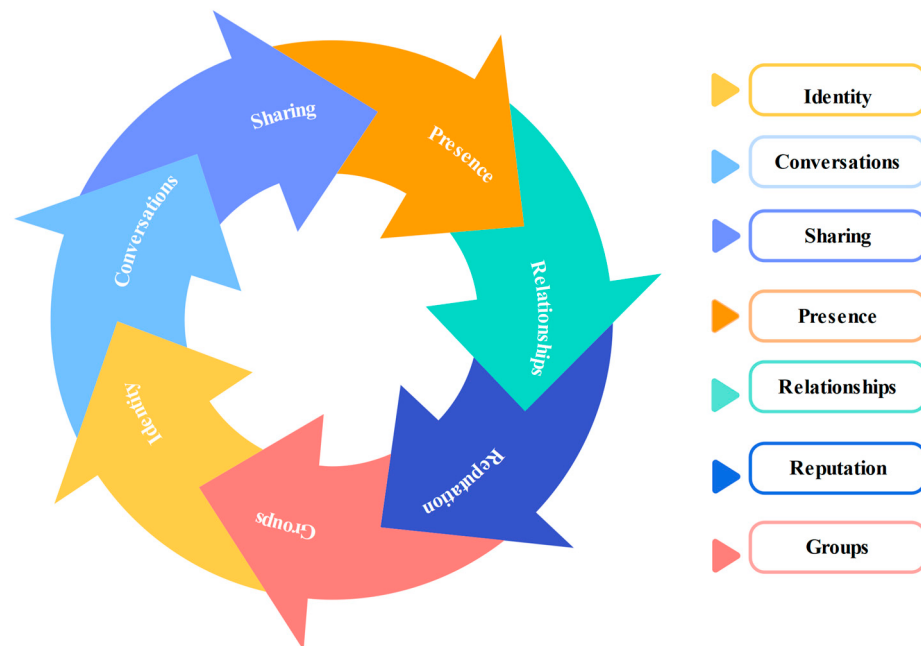


Figure 22. The Honeycomb model of social media by Smith, adapted from [13].

Smith posits that each element fosters emotional and cognitive connections between users and brands. The Honeycomb model enables brands to design effective strategies that strengthen online user interactions and leverage social engagement to enhance brand equity. For instance, online conversations between users and brands or among users can gradually create a positive brand image and increase brand awareness. The model is often utilized as a comprehensive framework for gaining deeper insights into social behaviors and their potential effect on brand equity [61]. Specifically, it enables brands to analyze the critical role of social media in building customer loyalty and trust.

The two models, Aaker and Honeycomb, can be used together to create a practical framework for building brand equity on social media. Aaker’s model provides the “what,” which refers to the core components of brand equity to be developed. However, the Honeycomb model provides the “how,” which refers to the specific social media functionalities and strategies that can be used to influence those components.

Table 1 shows the seven functional building blocks of social media, as conceptualized in the Honeycomb model by Kietzmann, Hermkens [60]. This framework shows how users engage with social media platforms through various dimensions. Understanding these building blocks aids in analyzing user behavior and strategizing effective engagement on social media platforms.

Table 1. Building blocks of social media and descriptions [13].

Building Block	Description
Identity	Revealing a brand’s identity to others in different ways, depending on each user.
Conversations	Social network conversations reflect self-expression, status, and the desire to share fresh or valuable insights.
Sharing	Social networks facilitate the sharing, exchanging, and receiving of content among users.
Presence	Social media platforms enable users to signal their presence and availability.
Relationships	Social networks enable interaction, reflecting how closely users are connected to others.

Table 1. *Cont.*

Building Block	Description
Reputation Groups	Social media users care about how they're perceived, with reputation often tied to trust. Social media groups reflect users' fundamental need for belonging in online communities.

5. Discussion

Previously identified studies, specifically the thematic cluster analysis in Section 4.4, addressed four key concepts related to the positive impacts of social media on brand equity, brand loyalty, and customer engagement, though each emphasizes different aspects. The first main group of papers focused on interactions and visual content [53,54]. Previous studies [44,53] highlight the significance of visual content and interactive elements such as clickable buttons, links, or calls to action (e.g., “Click to buy,” “Join,” or “Learn more”) in boosting user engagement with brands. Using engaging and interactive content can help capture users' attention and increase interactions.

The second leading group explored personalization and content quality [35]. Several studies [33,35,40,46] highlight the significance of effective social media marketing in fostering brand equity and customer loyalty. Specifically, it is highlighted that high-quality content, personalization, and direct and effective customer engagement are crucial in improving brand loyalty and equity. Other studies [29,54] address the impact of online interactions and communities on brand identity [62]. These studies suggest that fostering online brand interactions and communities can help build a stronger brand identity and increase consumer loyalty.

However, the third group highlighted two-way engagement strategies and reputation management [40]. An important observation in the literature confirms that implementing digital marketing methods has profoundly influenced SME performance when they have derived diminished advantages from conventional media [63]. The emergence of social media for SMEs enhanced market visibility and elevated financial rewards for enterprises that adeptly implement digital marketing techniques.

The fourth and most recent studies have examined marketing innovation [47] and sustainability awareness [50]. Other studies [47,50] focus on the importance of social networks in brand [64] innovation and increasing sustainability awareness. Social media can effectively share brand innovations and contribute significantly to shifting social and cultural behaviors toward sustainable development.

Table 2 shows the main research directions for exploring the positive impacts of social media. These studies focused on the topic's theoretical and general aspects, with limited investigations into how specific industries can utilize them in their fields. The limitation also exists in applying more complex techniques and strategies to leverage social media more effectively. Recommendations include enhancing content quality and personalization, leveraging influencers, implementing active community management, developing engagement strategies, and employing innovative marketing techniques.

5.1. Emerging Topics Based on the Scopus Analysis

As shown in the findings (refer to Section 4), by using specific keywords and conducting a search in the Scopus database in the first phase, a total of 1552 articles were extracted. In the second phase, by applying initial filters, including restricting the articles to journal articles and excluding conference papers and books, the number of articles decreased to 400 (refer to Section 4.2). Finally, using a final filter that involved selecting articles in English for better comprehension and standardization of the results reduced the number of articles to 149. This step-by-step and meticulous article selection process ensured the accuracy and

credibility of the research results, ensuring that only relevant and credible articles related to the research topic [65] were included in the final analysis. The gradual reduction in articles from 1552 to 400 and ultimately to 149 reflects the careful selection of scientific sources based on the established filters (refer to Section 4.4). It enhances the scientific reliability of the study.

Based on the analysis of the selected articles, one of the emerging topics since 2019 is using social media and digital media to enhance brand equity among SMEs [65], which has followed an upward trend. This growth indicates the increasing importance of digital media in branding strategies. KBEs have successfully leveraged these tools to establish more effective communications with their audiences, leading to increased brand awareness, enhanced customer loyalty, and improved brand equity. The results demonstrate a substantial increase in the volume of articles published in this domain since 2021, underscoring the growing interest from researchers and enterprises in the influence of social media on branding and marketing strategies. Particularly after 2020, there has been a sharp increase [66] in individuals' presence in the virtual space and a rise in research in this domain. The period from 2018 to 2024 has seen the highest relevance of topics such as brand equity, awareness, identity, loyalty, and branding with businesses and social media. These relationships highlight the increasing significance [64] of these subjects in digital marketing and branding initiatives. Overall, the results of these analyses emphasize the crucial role of social media and digital media in enhancing brand equity [67] for companies. Given the changing market conditions and increased online interactions, this trend has gained even greater significance in the post-pandemic era.

5.2. Global Trend Analysis

The outcomes derived from the review and analysis of Google Trends data between 2019 and 2024 indicate an exponential growth in global user searches related to brand equity [68], social media, and companies. As businesses, particularly during quarantine and physical restrictions, were forced to rely more on digital and online tools, the focus on creating and strengthening brands through social media became even more critical for many companies. These findings suggest that, as one of the most important competitive assets for companies, brands urgently need to pay attention to the digital space and leverage online tools to maintain and enhance their credibility. Social media, in particular, plays a vital role as an effective and widely used communication channel, contributing significantly to brand awareness and customer engagement, and ultimately enhancing brand equity. The increase in searches in this domain demonstrates that both companies and consumers have increasingly trusted and relied on these tools to expand the name and reputation of brands.

As a contribution, the paper shows that the geographical analysis of search data also reveals notable patterns. Countries such as the UAE, Qatar, Singapore, India, and the United States have shown the highest searches related to brand equity and social media. Most of these countries are known as emerging economies. This could signify the global importance of brands and the use of digital tools to strengthen brand presence in diverse markets. Understanding and leveraging search trends and data analysis is important, particularly for companies targeting new markets or competing globally.

Moreover, user searches have primarily focused on well-known brands, especially in the technology and business sectors. This could reflect the growing significance of technology brands in users' minds, who are increasingly interested in seeking information about the services and products of these brands. Additionally, this trend highlights that brands operating in specific industries, such as information technology and e-commerce, have successfully captured more attention in the digital space, particularly by utilizing social media and digital media for direct and effective communication with their customers.

5.3. Research Gaps

The studies by Gupta, Kumar [29] and Miller [33] highlight the lack of a comprehensive theoretical framework to elucidate the relationship between social media marketing and brand outcomes [69], identifying this as a notable research gap. Developing such a framework could enhance the understanding of the relationship between marketing strategies and brand equity.

None of the articles specifically addresses cultural and regional differences in the impact of social media marketing. However, considering cultural differences could help us better understand consumer behavior in different regions.

Most studies focus on the short-term effects of social media marketing, while the long-term impacts on brand loyalty and brand image remain underexplored.

Studies by Gholamveisy, Momen [39] and Wilson, Johnson [35] suggest that employing mixed methods (qualitative and quantitative) and examining the impact of social media across [24] various industries could yield more accurate results.

This review emphasizes that social media marketing and online interactions profoundly influence brand equity and customer loyalty [70]. However, significant gaps remain, including the need for comprehensive theoretical frameworks, attention to cultural differences, and the exploration of long-term effects. Developing innovative models and paying attention to multidimensional interactions in future research could help provide more practical solutions for brands.

Another gap that is also a significant area for future research is the influence of cultural factors on social media marketing and brand equity in the age of AI. Our systematic review revealed that a comprehensive, in-depth analysis of this topic is not yet a prominent theme in the academic literature. For example, recent empirical work on digital marketing in Pakistan has demonstrated that machine learning models and optimization algorithms can effectively capture cultural preferences, leading to a 20% increase in engagement and a 15% improvement in click-through rates [71]. This highlights the importance of integrating cultural insights into digital marketing strategies to enhance consumer engagement and optimize campaign performance. Future studies should therefore prioritize understanding how cultural dimensions impact the effectiveness of AI-powered social media strategies across different global contexts.

5.4. Research Contributions

This study aims to address some of the challenges and gaps in the existing literature regarding the impact of social media activities on brand equity in KBEs by combining theoretical models established based on the literature. Through in-depth analysis and the development of a comprehensive conceptual model, this research enhances understanding of the relationships between brand innovation, sustainable development [72], and social media activities, responding to the research needs identified in prior studies. The following section discusses how the gaps identified in previous research are addressed and outlines how this study contributes to advancing knowledge in social media branding.

This research contributes to filling the gaps highlighted by Gholamveisy, Momen [39] and Miller [33] by proposing a new conceptual model for KBEs, which focuses on strengthening brand equity through social media. The model integrates brand innovation, sustainable development, and direct customer interactions, providing a more comprehensive framework for studying the connections between social media marketing activities and brand equity outcomes.

This study partially addresses the gap by analyzing the role of visual content and brand personalization strategies concerning brand identity and social interactions [54]. The

findings suggest that storytelling techniques and content tailored to audience preferences significantly enhance user engagement.

This study expands on the findings of Wilson, Johnson [35] by offering actionable recommendations for brands to improve online social interactions and create emotional connections with customers. Their main focus was to emphasize the importance of community management and the role of influencers in strengthening brand loyalty. Considering the Honeycomb model in this research and examining the effects of different social media platforms on user interactions, this study contributes to a better understanding of the varying impacts of social media networks on consumer behavior, directly addressing the gap identified by Moran, Muzellec [53].

The main contribution of this study is to incorporate a sustainable construct into the model and explore how sustainability can be considered in brand equity in KBes; this research fills the gaps in the studies by Chalmeta and Barbeito-Caamaño [50] and Falakh [40]. The study demonstrates that sustainable development strategies on social media can enhance brand reputation and improve customer loyalty. The SDGs, specifically SDG 9 (Industry, Innovation, and Infrastructure), are integrated into the model based on brand equity and social media for KBes' products. A recent study suggested that new models are required for the organization's sustainable advantages by integrating green marketing, brand equity, and green branding [73]. KBes can align their product development and branding strategies with SDG 9 by prioritizing sustainable innovation over brand awareness. Their sustainable products and digital infrastructure contribute to resilient infrastructure [74], cities, and sustainable industrialization; therefore, these sustainability features must be highlighted in social media marketing to enhance brand equity.

SDG 9's focus on infrastructure applies to digital infrastructure that enables social media marketing. This may encourage SMEs to invest in using AI agents to support their social media engagement. SMEs can incorporate SDG 9 into their brand equity model by emphasizing sustainable supply chains and showcasing sustainable manufacturing processes through social media.

As shown in Table 2, this research further investigates the characteristics of brand communities in the digital space and their effects on customer loyalty and interactions. There is a need to identify hypothetical relationships affecting loyalty which could add new findings to the literature on social media, addressing the gap identified by Gupta, Kumar [29]. Finally, Section 4.1 and 4.4 review the value of multi-platform approaches and advanced engagement techniques on social media, offering practical recommendations for brands to leverage social media post pandemic more effectively. These findings, along with the content review in Section 4.2, assist brands in achieving greater customer interaction by combining multi-platform strategies and innovative approaches, addressing the gaps identified by Monica and BalaĀ [45] and Faisal and Ekawanto [46].

5.5. AI-Powered Social Media and Future Research Directions

The emergence of AI agents and tools will significantly impact future research projects. Table 2 shows three main directions for considering AI-powered applications in the context of SMEs and brand equity.

Table 2. Key directions for future studies with a focus on AI tools.

Potential AI-Based Research Directions	Advantages or Values
Collaboration between humans and AI using AI agents.	SMEs can compete more effectively with larger companies.
Developing AI tools tailored explicitly to SME needs, target audiences, and micro-segments within their audience.	AI affects SME B2B social media strategies and offers personalized customer experiences. Enhances AI-driven customization [2].
Generating new content and client engagement.	The effect of AI on the global reach of SMEs through social media.

First, the collaboration between humans and AI in social media marketing must be addressed as a key research objective. The future of SME B2B social media [65] is linked to the advancement of human–AI collaboration. This concern is not AI’s replacement of human creativity, but rather the utilization of its skills to complement and enhance it, making it more effective in its market. The emphasis is on achieving a nuanced balance between automation and genuine human interaction. For SMEs, this entails creating AI solutions capable of managing tedious or technically complex tasks, conducting data analysis, and generating preliminary content drafts, which typically require skilled labor and are not affordable for SMEs.

Furthermore, Table 2 shows that AI systems may extend beyond content generation to analyze brand language and tone from existing materials and propose modifications that align with particular audience segments. Human marketers would subsequently enhance and customize these recommendations, ensuring that the brand’s distinct identity is displayed and users are aware of it. For brand awareness, AI-driven content algorithms on platforms like Instagram and TikTok may analyze user behavior to personalize content feeds. This algorithmic approach may also increase the visibility of a brand’s products to relevant audiences. This algorithmic targeting allows KBEs to bypass traditional, broad-reach advertising and instead focus on micro-segments, ensuring their sustainable products are discovered by consumers most likely to value them.

This partnership encompasses real-time engagement. AI can evaluate and process numerous live chat data points to offer SME leaders recent contextual information and recommendations on continuing to ensure that the brand grows where its clients are supported. In terms of customer engagement, AI-powered chatbots and virtual assistants provide the whole day or night customer support, instantly answering queries about a product’s sustainable features [75]. This practice offers service delivery or response at lower costs while maintaining higher customer satisfaction. There is a need to focus on and showcase the ethical practices of these chatbots or virtual assistants, either in marketing or social media. This immediate, personalized interaction reduces response times and enhances the customer experience, which is a critical driver of positive brand perception. AI tools also analyze sentiment from social media conversations, providing real-time feedback that allows brands to quickly respond to public perception and mitigate potential reputational risks.

Second, offering personalized customer experience through AI needs to be extended for SMEs so they can improve the building of brand loyalty. AI algorithms are proposed to enhance the delivery of personalized customer experiences by SMEs on social media by analyzing customer data, behavior, and preferences. AI can tailor content, offers [65], and interactions to individual needs, which was not feasible previously. A high level of personalization fosters a sense of connection and loyalty, particularly for SMEs competing against larger corporations, since it can identify micro-segments within their audience, allowing for highly targeted campaigns that maximize impact.

The third future direction of social media brand equity for SMEs is using AI to enhance content creation and customer engagement. AI is evolving from simple automation

to augmenting human creativity and efficiency, allowing SMEs to produce high-quality, engaging content tailored to audience preferences in various world regions. Advanced capabilities, including dynamic content generation, trend analysis, automated scheduling, visual content enhancement, and content repurposing, enable SME businesses to maintain a consistent and active social media presence while reducing costs. Additionally, AI-powered chatbots offer personalized, non-stop customer support, integrating across platforms and providing proactive engagement, sentiment-based responses, and lead generation. However, data privacy can be a challenge, and future research should consider it to maintain a balance between human and AI interactions and continually optimize AI strategies.

While these directions are suggested, it is essential to highlight that the increasing reliance on AI and social media in marketing also raises significant concerns regarding data security [76], privacy [76], and ethics [77]. The key among these is data privacy [76], as AI-driven personalization relies on collecting vast amounts of user data, which raises questions about consent and security. The issue of algorithmic bias can also be critical, as biases in training data may lead AI systems to unfairly target or exclude certain demographic groups [78]. Lastly, the lack of transparency and accountability in how these algorithms operate can make it difficult for brands to understand and manage their own messaging, let alone for consumers to understand why they see certain content. The paper also referred to nine main bias possibilities because of (a) training data, (b) algorithmic focus bias, (c) processing bias due to algorithm approaches, (d) transfer context, (e) misinterpretation bias, (f) bias due to automation, (g) non-transparency issues, (h) consumer bias, and (i) feedback loop bias [79]. These considerations should be taken into account in future applications, particularly in the context of knowledge-driven enterprises. A responsible approach to AI-powered social media requires acknowledging and actively mitigating these risks.

6. Conclusions

This study aimed to investigate social media's role in enhancing KBEs' brand equity. In response to the aim, a novel model is established to include predictors of what may enhance the brand equity of KBEs. The findings suggest that social media serves as a strategic tool, significantly impacting the increase in brand awareness, improvement in perceived quality, strengthening of brand associations, and enhancing customer loyalty. Incorporating both innovation and sustainability in the proposed model's core constructs is due to their long-term impact and performance of knowledge-based organizations. The review of directions (Section 4) suggests that brand innovation drives the creation of new solutions that could enhance perceived quality. The effective use of social media significantly strengthens this and can drive marketing innovation through content grounded in environmental and social values. Concurrently, the study puts its core effort into enhancing sustainability awareness and sustainable behaviors. The study encourages the use of social media's ability to foster brand marketing innovation and increase sustainability awareness. The critical review (Sections 4 and 5) supports this by proposing a framework for raising sustainability awareness via social media, demonstrating how they can promote sustainable behaviors and contribute to the SDGs. This approach is especially impactful due to ongoing digital transformation and increasing environmental concerns, where sustainable innovation acts as a key differentiator.

The key findings are based on identifying influential factors on brand equity, including brand awareness, perceived quality, brand associations, brand loyalty, user identity, user presence, user relationships, reputation, groups, conversations, sharing, brand innovation, and sustainable development. These factors are presented in a preliminary model that systematically illustrates their relationships. Furthermore, social media serves as a platform

for direct customer interaction, enabling increased brand awareness and a more positive brand image. These interactions strengthen customer loyalty and allow companies to communicate their brand innovation capabilities and commitment to sustainable development in their knowledge-based products. In addition, brand innovation and a focus on sustainable development through social media positively influence perceived quality and brand associations. These factors are crucial for KBEs prioritizing advanced technologies and social responsibility.

A novel model is also developed based on the identified factors and an intensive literature review, which integrates two main concepts: (1) key brand-related constructs such as brand awareness and perceived quality, and (2) brand loyalty with social media-related factors such as user presence, user relationships, and sharing. This model helps KBEs enhance their competitive positioning in the market by leveraging digital tools.

Considering the sustainability challenges and the emergence of advanced AI-powered tools, a set of suggestions for future research has been established:

(a) Investigate the impact of cultural and geographical differences in social media usage and their influence on brand equity.

(b) Explore the role of emerging technologies, such as AI agents combined with advanced data mining and content generation tools, that affect SMEs' performance in marketing knowledge-based products.

(c) Conduct longitudinal research to investigate the influence of social media on brand equity and consumer loyalty over a longer period.

Our findings provide a foundational understanding of the research landscape in the field of KBEs and social media, yet a critical next step for the field is to move beyond literature synthesis. This means future studies should conduct empirical studies for validation and also to employ real-time data from platforms like TikTok and Instagram to capture the dynamic effects of AI-powered algorithms on brand communication.

6.1. Implications

The practical implications of this research offer valuable insights for KBEs, particularly SMEs, in leveraging social media to enhance brand equity. Companies can foster positive customer interactions and strengthen their brand image by producing high-quality, brand-aligned content. The findings underscore the importance of actively managing social media interactions and promptly responding to customer feedback, which can significantly improve brand loyalty and generate positive word-of-mouth. Creating and nurturing online brand communities encourages active customer participation [32], enhancing loyalty and brand advocacy. This research provides a practical guide to optimizing digital branding strategies for managers of science and technology parks and KBEs. Companies can effectively utilize social media to enhance brand awareness, cultivate lasting customer relationships, and enhance their competitive positioning in the digital marketplace. The study also highlights the potential of AI-powered tools in augmenting human creativity for content creation and customer engagement, offering a balanced approach that maintains an authentic brand voice while leveraging technological advancements.

The theoretical aspect of the implications lies in identifying themes and factors that cover this multidisciplinary field of AI, sustainability, and brand equity. These contribute to the growing body of literature on the intersection of social media [51], brand equity, and SMEs in the digital age. Unlike other bibliographic studies, this study used NVivo and conducted qualitative text analysis to review the summary of each paper selected for review. This helped to identify a wide range of keywords and factors that extend existing brand equity models by incorporating the unique dynamics of social media interactions and their impact on brand perception for KBEs.

The findings lay the groundwork for further study to integrate three key pillars: (a) brand equity, (b) social media, and (c) small businesses, identified by the network analysis with a time segmentation of 2008 to 2024. However, AI and sustainability are largely missing. This suggests investigating the long-term effects of artificial intelligence-driven client engagement on brand loyalty, particularly for SMEs. It also highlights the need to develop comprehensive AI integration strategies specific to SMEs, addressing the current gap in the literature. The review reveals the role of social media in enhancing brand equity for KBEs, offering a theoretical framework for understanding the evolving nature of brand-customer relationships in the digital era [24]. Furthermore, it opens avenues for future research on ethical considerations in AI-driven marketing for SMEs and the development of AI literacy within these organizations. This work contributes to the broader theoretical discourse on sustainable development, particularly SDG 9 (Industry, Innovation, and Infrastructure) [80], by demonstrating how digital innovation in SMEs can drive economic growth and competitiveness.

6.2. Review Limitations

This study is subject to several limitations that should be considered when interpreting its findings. First, the reliance on secondary data from Scopus and Google Trends (2019–2024) may not fully capture qualitative aspects of digital branding, such as user experiences. The paper focused on quantitative and network analysis, but empirical data can help address these limitations. A set of further studies is discussed in the Discussion section. Second, the trending analysis is confined to a specific timeframe, which may affect the temporal generalizability of the findings. This can be addressed by future review papers in the field screening and synthesizing the literature further. Third, the focus on KBEs limits the applicability of the results to other industries. This study specifically focused on SMEs as a gap in the literature, but future studies can investigate various industries over time to address the limitations. Finally, operational aspects of sustainable development were not comprehensively explored due to the emphasis on preliminary analyses. Future research could benefit from incorporating primary data, broader timeframes, verifications, quantitative analyses of sustainable development, and brand innovation.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

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