



# Product Values in the Digital Era and the Quest for Sustainable Competitive Advantage: A Bibliometric Mapping of Trends

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## ABSTRACT

Digital transformation is reshaping how organizations create product value and sustain competitive advantage, with technologies like Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain playing a pivotal role. However, few studies integrate the concepts of product value and competitive advantage within a digital framework. This study uses a bibliometric approach aligned with PRISMA guidelines to explore shifts in academic discussions on product value and sustainable competitive positioning in the digital age. Data from the Scopus database (2014-2024) were analyzed using VOSviewer and Biblioshiny R software to identify key research themes and trends. Findings reveal a gap in research that holistically addresses product value dimensions, even though digital technologies have significant impacts. Sustainability is a key theme, yet its integration with digital technologies for sustainable product development is underexplored. This study highlights the need for greater integration of digital technologies and sustainability principles to enhance product value and ensure long-term competitive advantage. It contributes to the field by offering a bibliometric overview of current research trajectories and suggesting future research directions.

**Keywords:** Product Value, Competitive Advantage, Digital Transformation, Artificial Intelligence (AI), Sustainability, Blockchain, Bibliometric Mapping

**JEL Classifications:** M310, O310, O350

## 1. INTRODUCTION

Digital transformation has fundamentally restructured modern business methodologies, altering how enterprises generate and convey product value to consumers (Sivaram et al., 2022; Wu et al., 2024). In this digital era, product value transcends conventional physical attributes, incorporating intangible facets such as customization, interactivity, emotional resonance, and connectivity (Chen et al., 2024; Jiang et al., 2022; Pino et al., 2024). A profound comprehension of product value is imperative as organizations are compelled to uphold a sustainable competitive edge amid swiftly evolving consumer inclinations and increasingly intense global rivalry (Aslam et al., 2020; Ferreira et al., 2022). The progress in information and communication technology (ICT), notably the internet, social media, artificial intelligence (AI), and

big data, has surfaced as an essential force in reshaping product value (Dash et al., 2023; Hou et al., 2023; Kreutzer and Sirrenberg, 2020). Utilizing this technology, enterprises can develop products imbued with substantial added value that satisfy functional requirements and deliver distinctive, personalized, and emotionally enriching customer experiences. Products once evaluated solely in terms of tangible quality or cost are now scrutinized based on their capacity to offer intangible values that can markedly affect consumer perception and foster customer loyalty (Eisend, 2008; Semenda et al., 2024).

The intrinsic value of a product can be outlined in four significant facets: functional, emotional, social, and economic (Lindström and Karlberg, 2017; Sun, 2021; Xu et al., 2022). Functional value pertains to the tangible benefits and utilities consumers derive

directly from using the product (Alonso-Rasgado et al., 2004). In the contemporary digital landscape, this functional value is further augmented through the incorporation of sophisticated technology, which facilitates enhanced efficiency and improved adaptability to the specific requirements of consumers (Zhang and Deng, 2024). Concurrently, emotional value is intrinsically linked to consumers' psychological and affective reactions (Yan et al., 2024). Contemporary digital products are frequently crafted to elicit joy, pride, or nostalgia, reinforcing the emotional bond between the product and the consumer (Chang and Wu, 2007; Khan and Mohsin, 2017). Conversely, social value pertains to the product's ability to foster or fortify relationships among individuals or particular communities (Sievers et al., 2024). A fitting example would be a digital service encouraging users to connect, exchange insights, and build stronger social links (Wang et al., 2024). Consequently, the product transcends mere individual consumption, emerging as a social tool that broadens networks and elevates the social standing of its users (Cherkasova and Slepishenko, 2021; He et al., 2017; Roberts et al., 2017). Concurrently, the financial significance underscores the harmony between the perks obtained from the product and the consumer expenditures. In this digital age, the efficiency of technology-driven production and distribution has markedly diminished costs and enhanced the economic value of products, rendering them more competitive within the global marketplace (Kamleitner and Hoelzl, 2009; Thomas, 2016).

Understanding Sustainable Competitive Advantage (SCA) is highly significant in the evolving business climate (Bari et al., 2024; Gao et al., 2022). SCA delineates an organization's capacity to sustain a challenging strategic edge for rivals to replicate, ensuring its longevity in competitive environments (Ceptureanu, 2016). Numerous theoretical frameworks, including the Resource-Based View (RBV), Dynamic Capabilities, and Value Chain Analysis, underscore recognizing and leveraging distinct internal resources, particularly intangible assets, to forge a durable competitive advantage (Andrade and Gonalo, 2021; C rte-Real et al., 2017; Gruber et al., 2010). Digitalization is a pivotal element that catalyzes the emergence of novel intangible resources, such as customer data, analytical algorithms, and digital platforms, which can cultivate sustainable competitive advantages (Elveny et al., 2023; Grimaldi et al., 2021). Nonetheless, scholarly inquiry remains sparse in the nexus between product value and sustainable competitive advantage from an integrative and holistic vantage point, mainly through a bibliometric lens. Current studies frequently focus on these two concepts separately without thoroughly exploring their interaction in a digital setting. Consequently, this study addresses this deficiency by systematically reviewing global research trends via a bibliometric methodology. This methodology facilitates a comprehensive overview of existing research patterns, elucidates emerging themes, and identifies the most consequential scientific contributions within the field.

The significance of this investigation resides in its capacity to furnish comprehensive empirical insights into how corporations in the digital age can adeptly amalgamate product value dimensions to establish a sustainable competitive edge. By acquiring a profound comprehension of contemporary research trajectories

and the patterns of conceptual and methodological advancements, organizations can more effectively devise adaptive and responsive business strategies in response to the fluidity of market dynamics. This research's results will provide a crucial tool for researchers striving to refine theoretical constructs in strategic management, digital marketing, and product innovation. Specifically, this study aims to systematically delineate and scrutinize the bibliometric landscape about product value in the digital epoch and its significance in cultivating sustainable competitive advantages. This investigation concerns two principal inquiries: (1) What are the predominant trends and thematic clusters within the scholarship on product value and sustainable competitive advantage in the digital context? (2) In what ways have conceptualizations and research methodologies progressed in this field? The originality and contribution of this research lie in its provision of a thorough bibliometric review that can aid in the identification of conceptual evolution, the analysis of nascent research trends, and the highlighting of prospective research agendas that are critical for theoretical advancement and the execution of effective business strategies in the global digital marketplace.

## 2. METHODS

This investigation employs bibliometric methodology as the primary framework for systematically examining the literature concerning product value in the digital age and its correlation to sustainable competitive advantage. The bibliometric approach was selected due to its capacity to visually and methodically delineate research trends, thematic clusters, and conceptual advancements derived from many scientific publications on an extensive scale (Rana, 2020).

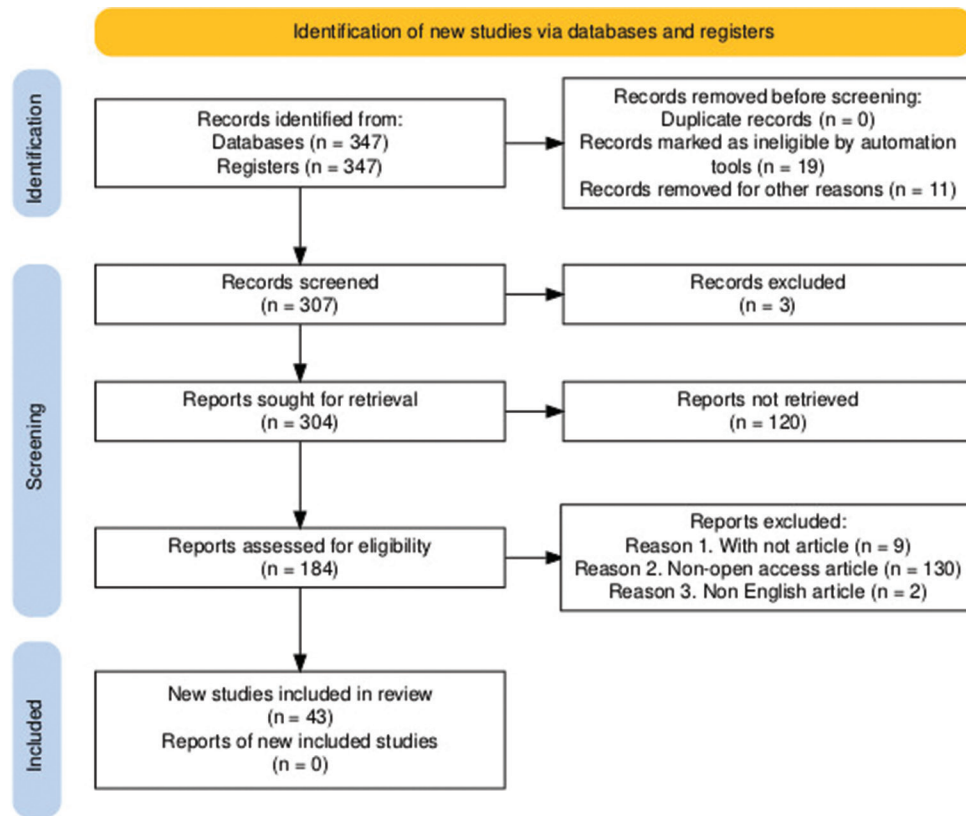
### 2.1. Data Source

The database employed in the present investigation is Scopus. This database was selected due to its esteemed reputation as a preeminent repository encompassing premier international journals across many scientific disciplines (Saputra et al., 2024). Scopus is acknowledged for its extensive coverage, superior article quality, and comprehensive bibliometric analysis capabilities, thereby significantly facilitating the bibliometric mapping process within this research.

### 2.2. Data Collection Procedure

In alignment with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines, the data acquisition process transpired over various phases (Figure 1). Initially, a meticulous hunt for relevant articles was executed in the Scopus database, applying the search string presented in Table 1.

This investigation yielded a total of 347 scholarly articles. Additionally, the subsequent screening phase involved a methodical filtration based on pertinent titles and abstracts, excluding 3 articles deemed irrelevant to the focal research theme. Following this meticulous process, 304 articles were identified to procure the complete texts. Among these, 120 articles were inaccessible in full text, leaving 184 articles for further consideration. The next stage required a thorough analysis of the eligibility of the articles by meticulously reviewing the entire

**Figure 1:** PRISMA Flow chart. Source: Haddaway et al. (2022)**Table 1: Scopus database search string**

Source	Search String
Scopus	TITLE-ABS-KEY ( ( "product values" OR "value creation" OR "product innovation" OR "customer value" OR "value proposition" OR "digital product value" OR "digital customer value" OR "digital consumer value" OR "digital product experience" OR "digital product strategy" OR "consumer engagement" OR "digital consumer engagement" ) AND ( "digital era" OR "digital transformation" OR "digitalization" OR "industry 4.0" OR "digital disruption" OR "digital technology" OR "digital innovation" OR "digital business model" OR "digital marketing" OR "internet of things" OR "IoT" OR "artificial intelligence" OR "big data" OR "cloud computing" OR "blockchain" OR "e-commerce" OR "digital business" ) AND ( "sustainable competitive advantage" OR "competitive advantage" OR "digital competitiveness" OR "market competitiveness" OR "competitive strategy" OR "business competitiveness" OR "competitive positioning" OR "competitive advantage in digital" ) )

texts; as a result of this evaluation, 141 articles were eliminated for the following reasons: 9 articles were deemed non-journal publications, 130 articles were unavailable via open access, and 2 articles were offered in a language that was not English. Ultimately, 43 articles that satisfied the established eligibility criteria were incorporated into the bibliometric analysis. The temporal scope of the search was delineated from 2014 to 2024, justified by the observation that this decade has witnessed rapid and substantial advancement in business digitalization, thereby rendering it pertinent for the identification of contemporary trends and themes that are intensively evolving about product value and competitive advantage within the digital epoch.

The temporal scope of the investigation was delineated from 2014 to 2024, predicated on the observation that during this decade, the phenomenon of business digitalization has undergone rapid and noteworthy advancements, thereby rendering it pertinent for the identification of contemporary trends and intensively evolving themes associated with product value and competitive advantage in the digital epoch. Alongside the temporal boundaries, this research

delineated detailed inclusion criteria as shown in Table 2, which specifies that only journal articles released in the English language at their final publication stage are permissible while excluding things like congress proceedings, conference papers, literature reviews, editorials, books, book chapters, items lacking peer review, articles behind paywalls, those still in the publication stage (in press), and non-English works. Defining these benchmarks aims to assure the quality, pertinence, and availability of the data applied in this bibliometric investigation (Saputra et al., 2025).

### 2.3. Data Analysis Techniques

Bibliometric data procured from Scopus were subsequently examined utilizing VOSviewer and Biblioshiny R software. The selection of VOSviewer and Biblioshiny R was predicated on their capacity to generate lucid bibliometric network visualizations alongside thorough and expansive descriptive statistical analyses, encompassing co-occurrence, co-citation, and bibliographic coupling assessments (Dervis, 2019). A keyword co-occurrence analysis was performed to elucidate research trends, principal themes, and interrelations among prominent keywords within

the literature. Moreover, we executed a co-citation analysis to uncover the most impactful texts and detail the conceptual interconnections among scholarly publications. Additionally, bibliographic coupling analysis was executed to categorize articles based on the congruence of references utilized, thereby illuminating the progression of trends and interconnected research cohorts. Ultimately, a temporal trend analysis was undertaken to assess the development of research themes and trajectories over a designated timeframe. The findings of this bibliometric analysis will be disseminated through network visualizations and tables that distinctly and comprehensively illustrate the evolving research patterns, thematic clusters, and prospective avenues for future inquiry. Applying this methodology is anticipated to furnish a holistic and profound understanding of the contemporary research landscape about product value in the digital epoch and its ramifications for sustainable competitive advantage.

3. RESULTS

3.1. Main Information

This portion outlines the discoveries made from the bibliometric data evaluation of articles accessed through the Scopus database, as indicated in Table 3. This overarching information encompasses the aggregate number of articles, the temporal span of publication, the categorization of articles according to document type, the

Table 2: The inclusion and exclusion criteria

Criteria	Inclusion	Exclusion
Year	2014-2024	Before 2014
Document type	Article	Congressional proceedings, conference papers, review, editorial, books, book chapters and other non-peer-reviewed publications, Closed Access.
Source type	Journals	Book, trade publications, book series, conference proceedings.
Publication stage	Final	Article in press
Language	English	Non-English

Table 3: Main information

Description	Results
Main information about data	
Timespan	2017:2024
Sources (Journals, Books, etc.)	34
Documents	43
Annual growth rate %	44.26
Document average age	2.98
Average citations per doc	23.21
References	2739
Document Contents	
Keywords plus (ID)	214
Author’s keywords (DE)	195
Authors	
Authors	128
Authors of single-authored docs	4
Authors collaboration	
Single-authored docs	4
Co-authors per Doc	3.02
International co-authorships %	32.56
Document types	
Article	43

publication language, and other salient attributes that facilitate a deeper comprehension of the research data’s scope.

The data subjected to analysis encompasses the temporal span from 2017 to 2024, signifying that this investigation is concentrated on the most recent advancements in product value and sustainable competitive advantage in the digital age context. Throughout this timeframe, a total of 34 sources, comprising both scholarly journals and academic books, were identified, with 43 documents chosen for rigorous examination. Furthermore, an annual growth rate of 44.26% was observed, illustrating the burgeoning scholarly interest in this subject matter in academic literature. The mean age of the documents was recorded at 2.98 years, suggesting that most of the publications examined were recent studies pertinent to contemporary circumstances. The articles exhibited an average citation count of 23.21, indicating that these scholarly works considerably impacted the academic community. Collectively, this study incorporated 2739 references, reflecting the extensive depth of literature analysis that was conducted.

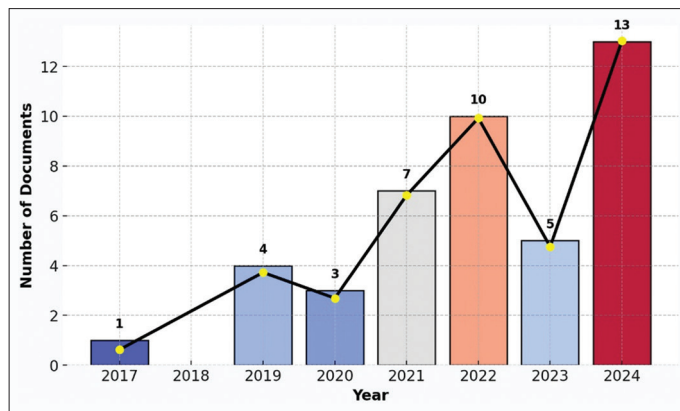
About the content of the documents analyzed, there exists a total of 214 supplementary keywords (Keywords Plus) along with 195 keywords attributed to the authors, which signifies the wide variety of subjects and concepts encompassed within this investigation. 128 authors have collaborated to produce this publication, with only 4 articles authored by individual contributors, thereby underscoring the preeminence of cooperative engagement in this research endeavor. The calculated average of 3.02 co-authors per document further substantiates that most of the articles are the outcomes of collaborative efforts among authors, exemplifying this inquiry’s interdisciplinary and cooperative essence. Moreover, approximately 32.56% of the author’s collaborations are international, underscoring the significance of global partnerships in generating pertinent research regarding product value and competitive advantage. All documents subjected to analysis are categorized as articles, ensuring that this study is exclusively predicated upon peer-reviewed scientific publications, affirming the credibility and integrity of the information. Collectively, this table offers a comprehensive examination of the trends, quality, and collaborative dynamics that characterize research on product value and sustainable competitive advantage in the context of the digital era, with data indicating notable contributions from various countries and institutions in advancing this subject matter.

3.2. Yearly Trend of Publication Number

This section aims to elucidate the yearly progression of the volume of scholarly publications generated within a defined temporal framework, specifically from 2014 to 2024 (Figure 2). It seeks to ascertain the evolution of academic inquiry about the themes of product value and sustainable competitive advantage in the digital age.

The trend of scholarly publications about product value and sustainable competitive advantage within the digital era is evidenced by the annual count of documents disseminated from 2017 to 2024. There has been a pronounced escalation in the number of publications throughout this timeframe, which signifies a burgeoning interest and scholarly focus on this subject matter. In



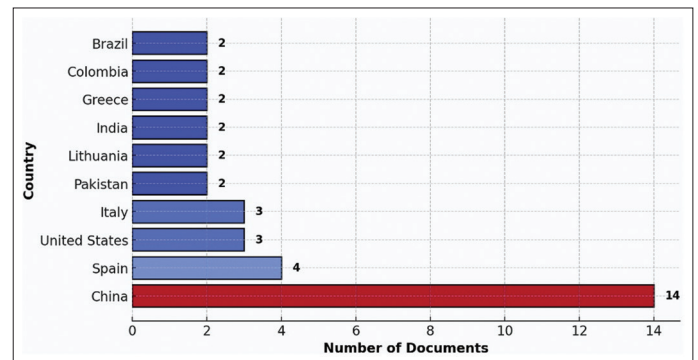
**Figure 2:** Documents by year

2017, a single article was published, suggesting that this area of inquiry remains nascent in its research development. This figure is relatively modest, potentially indicative of the preliminary acknowledgment of the significance of themes associated with digitalization in the framework of competitive advantage. In 2018 and 2019, the volume of articles experienced a modest uptick to 4 and 3 articles, respectively, signifying that, notwithstanding the incremental growth, scholarly investigation into this topic is still constrained and has not garnered substantial engagement from researchers.

Nonetheless, commencing in the year 2020, the trend in publication began to exhibit a more pronounced increase, with seven articles disseminated, signifying a heightened focus on this subject, potentially in reaction to the accelerating evolution of digital technologies. The year 2022 emerged as a pivotal juncture, with the publication of ten articles mirroring a robust momentum as the significance of digitalization in realizing sustainable competitive advantage became increasingly evident. The findings emphasize that inquiry into product value during this digital period is becoming more crucial and noteworthy, mainly due to technological advancements like the Internet of Things (IoT), artificial intelligence (AI), and extensive data. In 2023, the volume of publications experienced a slight reduction to five articles, which may signify a transient decline in scholarly interest or could alternatively be construed as a period of reflection and in-depth exploration of the prevailing theme. However, in 2024, the number of publications surged dramatically to thirteen articles, suggesting that this topic again garners substantial attention from the research community. This resurgence may be attributed to the intensifying acceleration of digitalization and the imperative to comprehend product value and its repercussions on competitive advantage amidst swiftly evolving market dynamics. This graph illustrates a favorable publication trend concerning product value and competitive advantage, with a notably significant increase observed in recent years. This phenomenon reflects the escalating significance of this subject within the realms of academic inquiry and practical business applications.

### 3.3. Top 10 Country Production

This section delineates the nations with the highest productivity levels in generating scholarly articles pertinent to this research subject (Figure 3). This information is crucial for comprehending

**Figure 3:** Documents by country

the principal hubs of international research engagement concerning the topic.

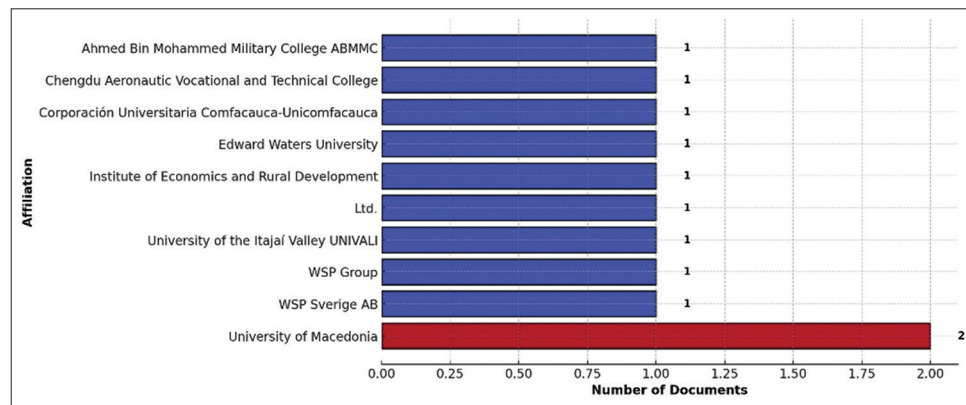
The distribution of scholarly articles about product value and sustainable competitive advantage within the context of the digital age, categorized by the nation of origin. An analysis of the extant data reveals that China significantly surpasses its counterparts with 14 published documents, thereby establishing itself as the preeminent contributor to research in this domain. This remarkable predominance of China indicates its substantial research capabilities in digital technology and commerce, which aligns with the nation's pivotal position in the evolution of digital technologies and the global economic landscape. Following China, other countries such as Spain, the United States of America (USA), and Italy have made comparatively moderate contributions, with respective outputs of 4 and 3 documents. Although these figures are inferior to those of China, they nonetheless underscore the notable involvement of these nations in generating research centered on product value and competitive advantage, particularly given the significant contributions of the United States and Spain in technological innovation and global business strategy.

Nations like Brazil, Colombia, Greece, India, Lithuania, and Pakistan have all provided two research articles to this dialogue. Despite the relatively modest nature of their contributions, this indicates that the subject is beginning to attract global scholarly interest, although not to the same degree as the more prominent nations. In summary, this graph illustrates that the investigation into product value and sustainable competitive advantage in the context of the digital age is predominantly shaped by significant nations like China, which leads to the volume of published works. Conversely, other countries also demonstrate notable engagement, albeit to a diminished degree, reflecting the processes of globalization and international cooperation in digitalization and business innovation.

#### 3.3.1. Most productive affiliations

This segment will elucidate the organizations or scholarly affiliations that demonstrate the highest levels of engagement in generating academic publications (Figure 4). Such information is instrumental in discerning the hubs of scholarly distinction that assume a preeminent position in this particular field of research.

The distribution of the volume of published scholarly articles regarding the subject of product value and sustainable competitive advantage in the context of the digital era is analyzed according

**Figure 4:** Documents by affiliation

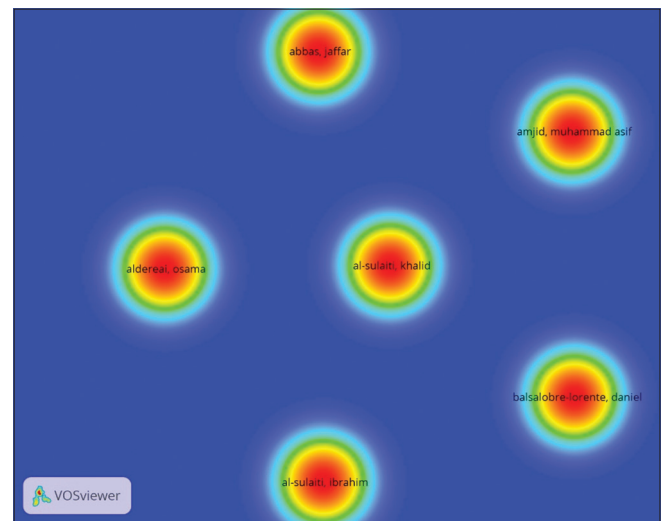
to institutional or university affiliation. The data analysis reveals that most affiliations have contributed merely a single document, suggesting that numerous institutions are engaging with this subject matter; however, their scholarly contributions remain relatively constrained. Notable institutions that have produced a solitary document encompass Ahmed Bin Mohammed Military College (ABMMC) (Abdelfattah et al., 2024), Chengdu Aeronautic Vocational and Technical College (Luo, 2024), Edward Waters University (Prasad et al., 2022), and the Institute of Economics and Rural Development (Ahmed et al., 2022), thereby indicating that this topic has commenced garnering considerable attention from a diverse array of educational and research institutions across various global regions.

Nevertheless, the University of Macedonia (Kamariotou et al., 2022; Kitsios and Kamariotou, 2021) has produced two scholarly articles, establishing it as the most prolific institution. This underscores the preeminent position of this university in the realm of research about product value and competitive advantage in the digital era. While contributions from other universities or affiliated entities are comparatively scarce, this figure substantiates the notion that the University of Macedonia stands as a principal research hub in this field, and its achievement in generating multiple publications may signify a level of expertise or an emphasis on this subject matter. In summary, this graph illustrates that while this topic is beginning to garner interest from numerous institutions, the individual contributions from each entity remain relatively modest. The most substantial input is attributed to the University of Macedonia, which may be regarded as one of the forefront leaders in this discipline. With the significance of articles produced by a handful of institutions, there is a prospect of improving teamwork among universities and different research organizations to investigate this theme more thoroughly.

### 3.3.2. Most productive authors

In this segment, the foremost prolific authors or scholars disseminating scholarly articles pertinent to this research area will be recognized and examined to elucidate the principal contributors who have significantly advanced the progression of the discipline (Figure 5).

The representation of the most prolific authors in research about product value and sustainable competitive advantage in

**Figure 5:** Most productive authors

the digital era is depicted through a network diagram generated by VOSviewer. This representation elucidates several scholars who have contributed substantially to this discourse, illustrated by the authors' names displayed within larger circles. Notably, more prolific authors such as Abbas, Jaffar, Amjid, Muhammad Asif, and Al-Sulaiti Khalid are discernible through the larger and more vividly colored circles, signifying an increased volume of scholarly publications during the analyzed timeframe. The enlarged circles represent a higher number of articles disseminated by these authors. In contrast, the lighter hues within the circles denote a heightened degree of engagement or contribution to this domain. Furthermore, authors such as Alderaai, Osama, Al-Sulaiti, Ibrahim, and Balsalobre-Lorente, Daniel are also recognized as significant contributors, albeit their contributions are marginally less substantial than those of the most prolific authors.

Overall, this visualization elucidates how prominent scholars contribute to enhancing the literature concerning product value and competitive advantage in the digital age. This data offers valuable insights into the leading researchers who pervade this subject, potentially as a fundamental reference for subsequent inquiries in this domain. The preeminence of a select few notable figures within this network further indicates that this subject has garnered considerable interest from more seasoned researchers and

that interdisciplinary collaboration among authors from diverse backgrounds is increasingly vital for advancing this field.

### 3.3.3. Top 10 most published journals

In this segment, the scholarly publications that most routinely disseminate articles addressing product value and competitive advantage within a digital framework will be elucidated, thereby assisting researchers in identifying pertinent literature sources (Figure 6).

The distribution of published documents about product value and competitive advantage within the digital epoch is analyzed based on the journals responsible for disseminating these works. From the presented graph, it is evident that Sustainability (Switzerland) holds a preeminent position with a total of 8 documents, signifying its substantial influence in the publication of scholarly articles on this subject matter (Gorgoglione et al., 2023; Tafti et al., 2024). The prominence of Sustainability (Switzerland) underscores the significance of the discourse surrounding sustainable competitive advantage and product value, grounded in sustainability principles, which resonates with the global trend toward heightened scrutiny of environmental and societal concerns within the business paradigm. Furthermore, two additional journals have made noteworthy contributions to this field, specifically Applied Mathematics and Nonlinear Sciences (Luo, 2024; Wu et al., 2024) and Revista de Gestao (Andrade and Gonalo, 2021; da Silva et al., 2024), each having published two documents. These journals represent substantial contributions to the academic literature concerning this theme, with Applied Mathematics and Nonlinear Sciences potentially emphasizing quantitative analyses pertinent to the digital milieu and competitive advantage. At the same time, Revista de Gestao is likely to concentrate more on this subject's managerial and strategic dimensions.

Other academic journals, such as Applied Sciences (Switzerland) (Sun, 2021), Computational Intelligence and Neuroscience (Wang and Wu, 2022), Computers Materials and Continua (Wu et al., 2019), Digital Transformation and Society (D rfling and Godspower-Akpomemie, 2024), Discrete Dynamics in Nature and Society (Zhao et al., 2021), Finance: Theory and Practice (Cherkasova and Slepushenko, 2021), and Frontiers in Artificial

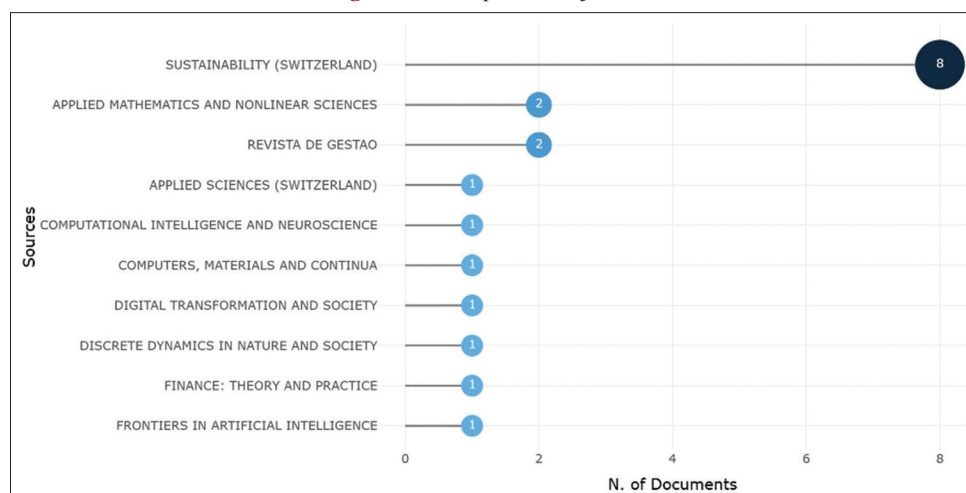
Intelligence (Bughin, 2023), each disseminated merely one scholarly document. Notwithstanding their relatively modest contributions, the heterogeneity of these journals indicates that the research theme about product value and sustainable competitive advantage has captivated scholars from diverse disciplines, including computer science, economics, and finance, who concentrate on facets of technology, intelligent systems, and digital innovation. Collectively, this data illustrates a comprehensive overview of the most significant journals within this domain and highlights the variety of literature sources researchers utilize to enhance their comprehension of product value and competitive advantage in the context of the digital age. This variety of sources epitomizes the interdisciplinary and multidisciplinary characteristics of the subjects under consideration.

### 3.4. Top 10 The Most Cited Paper

This segment delineates the preeminent scholarly articles, distinguished by the most significant citation frequency, as illustrated in Table 4. Such data is instrumental in comprehending the principal scientific contributions that have exerted a considerable influence within this domain.

The ten most frequently cited scholarly articles within the research domain of product value and sustainable competitive advantage during the digital era are delineated, taking into account total citation counts, annual citations, and normalized citation metrics. Leading this cohort is Aslam et al. (2020), whose manuscript titled "Innovation in the Era of IoT and Industry 5.0: Absolute Innovation Management (AIM) framework," published in Information (Switzerland), has garnered a total of 221 citations alongside an impressive average of 36.83 citations annually, yielding a normalized citation figure of 2.55. This data underscores the paper's preeminent status, reflecting its substantial impact and recognition within the academic discourse about innovation in the digital age and the paradigm of industry 5.0. In the second position, Kitsios and Kamariotou (2021) authored the article "Artificial Intelligence and business strategy towards digital transformation: A research agenda," which appeared in Sustainability (Switzerland) and has accumulated a total of 148 citations, averaging 29.6 citations per year, with a normalized citation rate of 3.85, surpassing that of Aslam et al. (2020), thereby

Figure 6: Most published journals





**Table 4: The most cited paper**

Rank	Author	Article title	Source	Total citations	Total citations per year	Normalized total citations
1	(Aslam et al., 2020)	Innovation in the era of IoT and industry 5.0: Absolute innovation management (AIM) framework	Information (Switzerland)	221	36.83	2.55
2	(Kitsios and Kamariotou, 2021)	Artificial intelligence and business strategy towards digital transformation: A research agenda	Sustainability (Switzerland)	148	29.6	3.85
3	(Abbas et al., 2024)	Financial innovation and digitalization promote business growth: The interplay of green technology innovation, product market competition and firm performance	Innovation and Green Development	87	43.5	8.7
4	(Diez-Martin et al., 2019)	Research challenges in digital marketing: Sustainability	Sustainability (Switzerland)	61	8.71	2.2
5	(Wiesner et al., 2017)	Cyber-physical product-service systems challenges for requirements engineering	International Journal of Automation Technology	58	6.44	1
6	(Florek-Paszowska et al., 2021)	Business innovation and critical success factors in the era of digital transformation and turbulent times	Journal of Entrepreneurship, Management and Innovation	56	11.2	1.46
7	(Yu et al., 2022)	Influence of Digital Transformation Capability on Operational Performance	Sustainability (Switzerland)	37	9.25	2.87
8	(Remondino and Zanin, 2022)	Logistics and Agri-Food: Digitization to Increase Competitive Advantage and Sustainability. Literature Review and the Case of Italy	Sustainability (Switzerland)	36	9	2.79
9	(Kifokeris and Koch, 2020)	A conceptual digital business model for construction logistics consultants, featuring a sociomaterial blockchain solution for integrated economic, material and information flows	Journal of Information Technology in Construction	34	5.67	0.39
10	(Senthil Kumar and Iyer, 2019)	An industrial iot in engineering and manufacturing industries - Benefits and challenges	International Journal of Mechanical and Production Engineering Research and Development	32	4.57	1.15

indicating a significant contribution to the exploration of artificial intelligence's role in facilitating digital transformation. Occupying the third rank, Abbas et al. (2024) presented the article "Financial Innovation and Digitalization Promote Business Growth: The Interplay of Green Technology Innovation, Product Market Competition and Firm Performance," published in *Innovation and Green Development*, which has received a total of 87 citations and boasts an exceptional average of 43.5 citations per year, exemplifying the pertinence and considerable influence of the discourse surrounding financial innovation and digitalization as catalysts for business growth.

Other scholarly articles, including Diez-Martin et al. (2019), Wiesner et al. (2017), and Florek-Paszowska et al. (2021) exhibit a comparatively lower citation count; nonetheless, they offer substantial contributions toward elucidating the complexities encountered in digital marketing, physical-product frameworks, and the determinants of success in digital transformation. In the context of citation normalization, Kitsios and Kamariotou (2021) with a score of 3.85, and Abbas et al. (2024) at 8.7 are particularly noteworthy, suggesting that these studies are esteemed and pertinent within a relatively brief period following their publication, thereby yielding critical insights into the discipline. Collectively, Table 4 delineates the extent to which pivotal subjects such as digitalization, technological innovation, and sustainability in commerce garner considerable scholarly focus, with numerous publications achieving significant influence through elevated

citation rates and extensive relevance in both academic and practical discourse.

### 3.5. Most Impact Journals

This section will describe journals with high impact based on specific metrics, such as impact factor or CiteScore, which help highlight influential publications in the field (Table 5).

The highest-impact journals are evaluated based on H-index, G-index, M-index, and cumulative citations. From the findings presented, *Sustainability* (Switzerland) is highlighted as the top journal, as shown by an H-index of 5, a G-index of 8, an M-index of 0.714, and a total of 301 citations. A high H-index signifies that the journal encompasses numerous highly cited articles. In contrast, elevated G-index and M-index values indicate that the articles published within the journal are of exemplary quality and are frequently referenced. The substantial number of citations further underscores the journal's significant influence on sustainable competitive advantage and Sustainability. Afterward, *Applied Sciences* (Switzerland), despite its low H-index of 1, a G-index of 1, and an M-index of 0.2, has garnered a cumulative total of 10 citations. Although its contribution is comparatively modest, this journal remains pertinent, albeit it has not yet attained the same level of influence as *Sustainability*.

Other scholarly publications, including *Computational Intelligence and Neuroscience* and *Computers, Materials and Continua*, exhibit



a diminished H-index of 1, G-index of 1, and M-index, respectively, thereby indicating a restricted contribution to the academic discourse, with a total of 4 and 11 citations. These publications may be regarded as supplementary references; however, their scholarly influence remains comparatively constrained. Information (Switzerland) similarly presents a low M-index (0.167) yet possesses a substantial total of 221 citations, demonstrating significant scholarly impact despite its modest H-index and G-index. In contrast, Innovation and Green Development has garnered 87 citations alongside an M-index of 0.5, which signifies a notable influence within innovation and sustainable development. Collectively, this table delineates a pronounced disparity in the scholarly impact of journals engaged in the discourse surrounding product value and sustainable competitive advantage in the contemporary digital era. Sustainability (Switzerland) emerges as the predominant entity regarding influence and contribution to the existing literature, while other journals also provide meaningful contributions, albeit to a lesser extent. This underscores the critical role of highly cited journals in the advancement and reinforcement of comprehension within this particular field of study.

### 3.6. Thematic Development

This segment delineates the thematic evolution of the research undertaken, concentrating on the shifts in research emphasis and the principal themes that have surfaced within the existing literature (Figure 7).

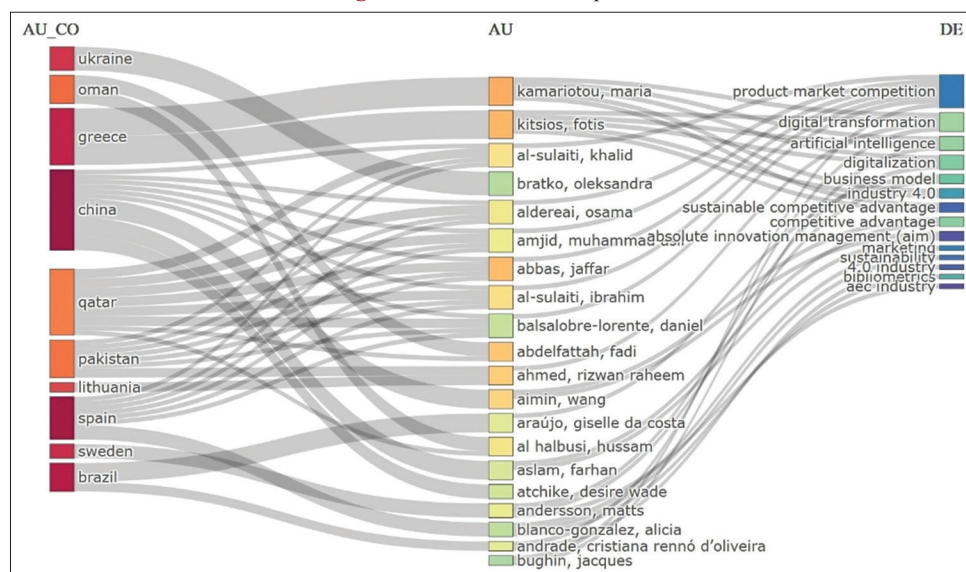
Thematic evolution within the domain of product value and sustainable competitive advantage in the digital age is elucidated through the interconnections among authors, their respective countries of origin, and the principal themes articulated in the corpus of literature. The accompanying diagram illustrates a multifaceted network that interlinks nations (AU\_CO), authors (AU), and thematic areas (DE) that constitute the focal point of this inquiry. On the left segment (AU\_CO), nations such as China, Greece, and Ukraine manifest as significant contributors in scholarly publications, with China as the most prolific contributor to the subjects addressed. These nations also assume a pivotal role in introducing and elaborating diverse themes pertinent to digitalization and sustainability in the context of competitive advantage. The central portion (AU) delineates the authors actively engaged in this body of literature. Specific authors, including Kamariotou et al. (2022), concentrate on “product market competition” and “digital transformation,” which are relevant to the contemporary challenges digital enterprises face. Other scholars, such as Abbas et al. (2024), who investigate sustainable competitive advantage and Industry 4.0, tend to integrate technological and sustainability dimensions within their research endeavors.

The extreme right section (DE) delineates the thematic constructs that constitute the primary focus of this scholarly inquiry, encompassing digital transformation, artificial intelligence,

**Table 5: Most impactful journals**

No	Source	H-index	G-index	M-index	Total Citation
1	Sustainability (Switzerland)	5	8	0.714	301
2	Applied Sciences (Switzerland)	1	1	0.2	10
3	Computational Intelligence and Neuroscience	1	1	0.25	4
4	Computers, Materials and Continua	1	1	0.143	11
5	Discrete Dynamics in Nature and Society	1	1	0.2	27
6	Finance: Theory and Practice	1	1	0.2	10
7	Frontiers in Artificial Intelligence	1	1	0.333	8
8	Global Business and Finance Review	1	1	0.25	7
9	Information (Switzerland)	1	1	0.167	221
10	Innovation and Green Development	1	1	0.5	87

**Figure 7: Thematic development**



business model innovation, and sustainable competitive advantage. These constructs are intrinsically linked to organizations' endeavors to acclimate to the digital milieu, enhance their competitive stature, and formulate innovative business models that align with contemporary technological advancements. Collectively, this visual representation elucidates the intricacy and profundity of the subjects examined in research about product value and competitive advantage. It additionally highlights the collaborative efforts of various nations and authors in investigating pivotal themes that hold significant relevance to global business predicaments and the swift pace of digital evolution. This analysis underscores the significance of international cooperation in an increasingly interconnected research landscape and the contributions of diverse authors in shaping discourse and solutions to the challenges confronting organizations in the digital age.

### 3.6.1. Thematic evolution

This subsection elucidates the modifications and progression of research themes throughout temporal intervals, thereby offering a comprehensive understanding of this academic discipline's developmental trajectory (Figure 8).

Thematic progression in scholarly inquiry regarding product value and sustainable competitive advantage within the digital epoch is analyzed through a comparative lens of three principal themes, artificial intelligence, competitive advantage, and digital transformation, across two distinct temporal intervals: 2017-2021 and 2022-2024. The accompanying graph delineates the evolution of the prioritization of these themes over time, thereby illustrating the transitioning emphasis within digital and business research. During the interval spanning 2017-2021, the preeminent themes in academic investigation were artificial intelligence and competitive advantage. This observation suggests that in this timeframe, scholarly endeavors were predominantly concentrated on implementing artificial intelligence as a mechanism for engendering competitive advantage across various industrial domains, alongside its ramifications for market dynamics. Research conducted during this epoch may have emphasized using advanced technologies to enhance business efficiency and performance amid an increasingly intense global competitive landscape.

Nevertheless, from 2022 to 2024, digital transformation has emerged as a salient theme, supplanting the previously predominant emphasis on competitive advantage. This transition signifies a

paradigm shift within the realm of scholarly research, wherein the emphasis is now pivoting towards digital transformation as a pivotal determinant of business sustainability and progression. While artificial intelligence remains significant, the focus on digital transformation indicates that more research is concentrated on how organizations implement digital technologies to enhance their overall operational efficacy rather than solely focusing on isolated competitive advantages. In summary, this figure exemplifies the ongoing expansion of the research domain about product value and sustainable competitive advantage within the context of the digital era, which continues to evolve in tandem with the swift advancement of technology. The heightened attention to digital transformation during the 2022-2024 timeframe signifies a substantial reorientation in how enterprises conceptualize technology adoption, with a comprehensive emphasis on the holistic digital transformation process rather than merely seeking competitive advantages within a conventional framework.

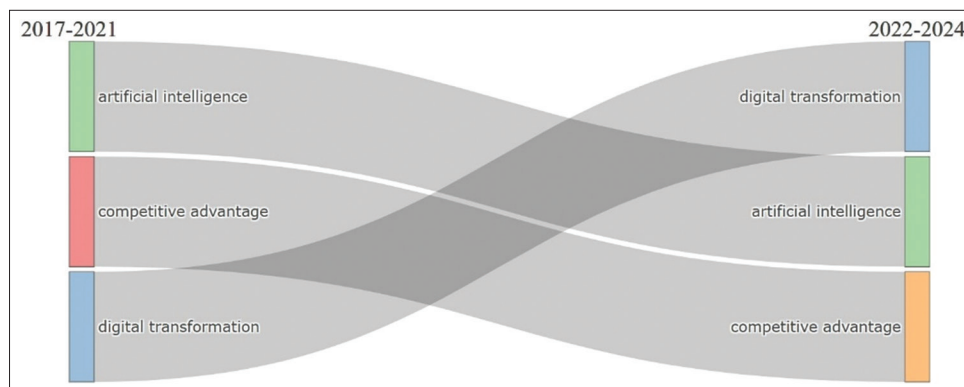
### 3.6.2. Thematic map

This segment provides a thematic map representation that elucidates the primary thematic clusters and interrelationships among themes related to the investigation of product value and competitive advantage in the digital age (Figure 9).

A thematic diagram illustrating the distribution of diverse research themes pertinent to product value and competitive advantage within the context of the digital age, utilizing two principal axes: degree of relevance and level of development. The diagram is partitioned into four quadrants that delineate the status and placement of each theme contingent upon its degree of significance and level of development. In the upper right quadrant, designated as the Motor Themes, one can find themes such as "Bibliometrics," "Marketing," "Sustainability," and "Internet of Things." These themes exhibit a high degree of relevance. They are significantly advanced in the extant literature, signifying areas that exert a substantial impact and continue to proliferate dynamically within the discourse of competitive advantage. For instance, "Sustainability" encapsulates the escalating focus on sustainability about competitive advantage, whereas "Internet of Things" increasingly predominates digitalization and industrial transformation dialogues.

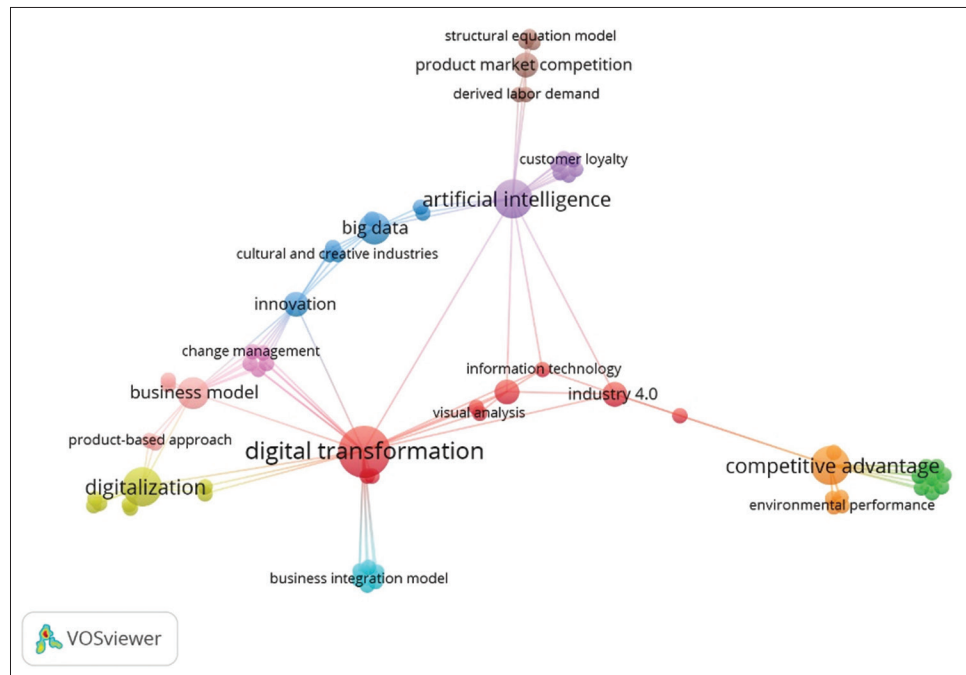
In the upper left quadrant designated as Niche Themes, one can observe the concept of "Product Market Competition," which represents a pertinent theme yet remains in a nascent stage of

**Figure 8:** Thematic evolution







**Figure 11:** Network visualization

present research initiatives. Digital transformation materializes as the preeminent theme, denoted by larger and more luminous font sizes, underscoring the significance of digital transformation in fostering competitive advantage and enhancing business competitiveness. The concept of artificial intelligence also assumes considerable importance, signifying the integration of technology to refine business operations and facilitate decision-making processes. Keywords such as “big data,” “internet of things,” and “blockchain” similarly feature prominently, indicating that additional pivotal technologies are also rendering substantial contributions to the examination of competitive advantage and sustainability. Words connected to “sustainability,” “innovation,” and “product market competition” showcase the significant influence of sustainability and innovation on competitive business approaches in the current digital timeframe. These keywords reflect the progressive shift in research towards the utilization of technology to tackle tangible challenges, such as market dynamics and environmental sustainability.

The Network Visualization elucidates the interrelations among the predominant keywords within the research landscape, thereby demonstrating the interconnectedness of these principal topics. Digital transformation is positioned at the network’s nucleus, signifying its status as a pivotal theme within this domain, with numerous other keywords exhibiting direct associations with it. The constructs of artificial intelligence, big data, and business models are interlinked, forming a cohesive cluster surrounding digital transformation. This underscores the critical importance of novel technologies and innovative business models in facilitating digital transformation within organizations. Furthermore, the concepts of competitive advantage and Industry 4.0 are associated with digital transformation, suggesting a progressive shift in contemporary competitive advantage research toward integrating emergent technologies to achieve market dominance. The visualization further indicates that themes such as sustainability

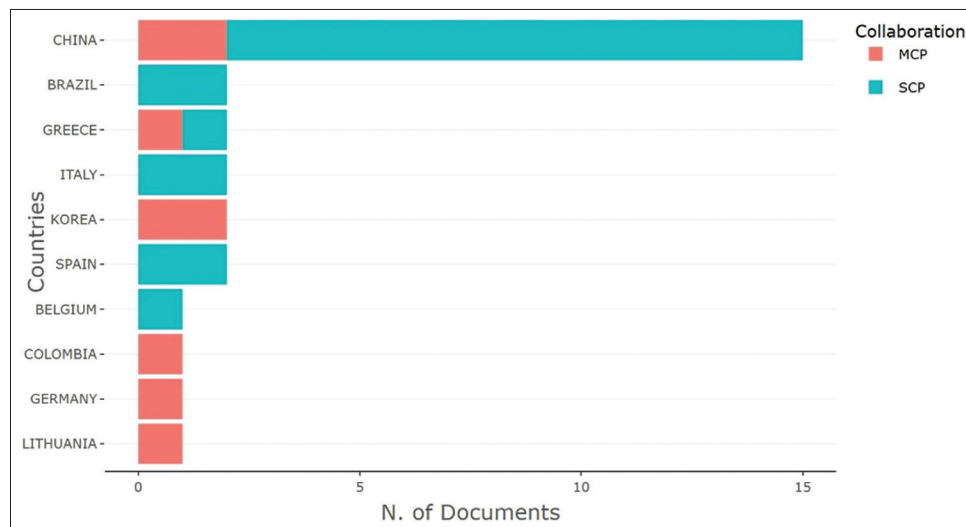
and product market competition are located slightly more distantly yet remain closely associated with the central thematic core, thereby highlighting sustainability’s significant role in attaining enduring competitive advantage.

Overall, these statistical representations elucidate a distinctly coherent understanding of the interrelations and developments of the principal themes within this research whilst also delineating the most pertinent and interconnected subjects about product value and competitive advantage in the contemporary digital era. The predominant themes indicate the significant transformations occurring within the business landscape, progressively relying on technological advancements and innovative practices to sustain competitiveness and viability in the global marketplace.

### 3.8. Collaboration of Scientific Productions between countries

In this segment, a comprehensive examination of the dynamics of international cooperation among nations in generating scientific publications will be articulated, illustrating how global research networks are established in this domain, as evidenced in Figure 12 and Table 6.

Scientific Production Collaboration between Nations delineates the collaborative efforts among nations in generating scholarly publications pertinent to this research domain. China is prominently recognized as the most prolific nation, exhibiting a markedly higher volume of publications than its counterparts. This figure elucidates China’s preeminence in international scientific output, which was succeeded by countries such as Brazil and Greece, which contributed significantly, albeit to a lesser extent. Conversely, nations such as Lithuania and Germany demonstrate comparatively lower contribution levels regarding the quantity of publications, thereby highlighting the unequal distribution of global research outputs.

**Figure 12:** Collaboration of Scientific Productions between countries**Table 6:** Collaboration of scientific productions between countries

No	Country	Articles	SCP	MCP	MCP %
1	India	15	13	2	13.3
2	Canada	2	2	0	0
3	China	2	1	1	50
4	Indonesia	2	2	0	0
5	Italy	2	0	2	100
6	USA	2	2	0	0
7	Mexico	1	1	0	0
8	Pakistan	1	0	1	100
9	Argentina	1	0	1	100
10	South Africa	1	0	1	100

An examination of the data in Table 6 reveals that India is responsible for the highest output of scholarly articles, totaling 15 publications, among which 13 are categorized as international collaborations (SCP). At the same time, 2 are designated as collaborations within the framework of MCP (Multinational Collaborative Publications). The MCP percentage of 13.3% indicates that most of the international collaborations undertaken by India are characterized by partnerships involving multiple nations rather than being confined to a single country or institution. In contrast, Italy, Pakistan, Argentina, and South Africa each demonstrate a complete 100% rate of MCP collaboration, suggesting that every article produced by these countries during this timeframe was the result of robust international collaboration despite their relatively minor contribution to the aggregate volume of publications. Conversely, nations such as Canada and Mexico exhibit MCP figures of 0%, signifying a predominant emphasis on autonomous research or limited collaborative efforts within their respective borders. Although China has a lower total of articles (2 publications), it boasts an MCP rate of 50%, reflecting a noteworthy level of international research collaboration, albeit on a more restricted scale than countries like India.

Overall, Table 6 and Figure 12 illustrate a markedly heterogeneous pattern of scientific collaboration among nations across the globe. India and China are particularly prominent in terms of the volume of publications and international partnerships. In

contrast, nations exhibiting 100% MCP play a notable role in international collaborative frameworks despite contributing less to the overall publication output. This emphasizes the critical significance of international cooperation in research concerning product value and competitive advantage within the digital age, which is progressively facilitating cross-border collaboration to tackle increasingly intricate global challenges.

### 3.9. Identifying Gaps in the Literature

Although the prevailing body of literature indicates considerable advancements in the comprehension of product value and sustainable competitive advantage within the digital age, several research voids persist that have yet to be addressed. One significant concern is the limited number of empirical investigations directly addressing combining digital technologies, including Artificial Intelligence (AI), Internet of Things (IoT), and blockchain, in fostering long-term competitive advantage via increased product value. Although numerous scholarly works have analyzed the individual effects of these technologies, a limited number have scrutinized the synergistic interactions among these elements and their collective contribution to formulating a comprehensive strategy for sustainable competitive advantage. The existing scholarship predominantly concentrates on the ramifications of these technologies within specific sectors or industries, neglecting to consider the broader implications of cross-sector integration.

Furthermore, numerous scholarly investigations continue to analyze these constructs in isolation, explicitly distinguishing between product value and sustainable competitive advantage, without exploring a more integrative relationship between the two within the framework of accelerated digitalization. These inquiries predominantly emphasize the benefits of digital technology in enhancing product value yet infrequently investigate how the interplay among diverse dimensions of product value, namely functional, emotional, social, and economic values, contributes to the establishment of sustainable competitive advantage. This indicates a deficiency in the literature about the amalgamation of various dimensions of the product value in the formulation of competitive advantage, whereas, in real-world applications,

enterprises must adeptly leverage all of these aspects concurrently to achieve pronounced differentiation.

Furthermore, the extant body of literature frequently emphasizes the circumstances of developed nations or large enterprises with sufficient digital infrastructure. Scholarly inquiries addressing the obstacles and prospects for enterprises in developing countries or small and medium-sized enterprises (SMEs) regarding implementing digitalization to enhance product value and sustain competitive advantage remain remarkably scarce. Digitalization in developing nations frequently encounters infrastructural impediments, resource limitations, and variances in the degree of technology adoption, rendering the methodologies employed in developed countries not universally applicable. Consequently, it is imperative to explore more deeply how firms in developing countries can assimilate digital technologies to foster sustainable competitive advantage, along with the particular challenges they encounter throughout this process.

Moreover, although the discourse surrounding sustainability has garnered substantial scholarly attention within the realms of product valuation and competitive advantage, there remains a paucity of empirical investigations that specifically explore the potential integration of digital technologies with sustainability paradigms within the product and organizational management domain. The discourse on sustainability in the scope of digitalization predominantly emphasizes the mitigation of the environmental repercussions associated with the technology itself. At the same time, scant attention is devoted to the capacity of digitalization to foster the development of more sustainable products and to enhance a firm's enduring competitive edge. Further scholarly inquiry must be conducted to elucidate how enterprises can effectively incorporate sustainability practices into their digital frameworks, thus securing a competitive advantage and contributing to sustainable development's overarching objectives.

#### 4. DISCUSSION

In the swiftly transforming digital epoch, the phenomenon of technological metamorphosis has fundamentally altered the methodologies employed by corporations in the creation and dissemination of product value (Florek-Paszowska et al., 2021; Santos and Malta, 2024). This article delineates an exhaustive examination of the evolution of the construct of product value and sustainable competitive advantage within the framework of digital contexts. A bibliometric assessment reveals that, despite the rapid proliferation of research in this domain, numerous dynamics and interrelationships warrant further investigation. Adopting digital advancements, encompassing Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain, has surfaced as key factors in developing progressively customized, original, and emotionally significant product value for consumers (Abdelfattah et al., 2024; Dash et al., 2023). Still, there is a critical need to investigate more thoroughly how the intersection of these technologies can provide an enduring competitive edge, primarily in inter-sector cooperation.

An essential conclusion from this study is that the existing literature primarily stresses specific elements of product value,

like functional and emotional aspects, but frequently neglects the thorough combination of all product value dimensions. Today, the value attributed to products spans four significant dimensions: functional, emotional, social, and economic (Kunkel et al., 2017; Lee, 2020; Sun, 2021). Nevertheless, further scholarly inquiry is imperative to elucidate how the amalgamation of these dimensions can cultivate a more enduring competitive advantage over time. Digital technology significantly influences how functional value is acquired and disseminated to consumers; however, the emotional and social dimensions are frequently not leveraged to their utmost potential within the business strategies enacted by numerous organizations (Ertiö et al., 2024; Straker and Wrigley, 2016).

As digital technology attains heightened significance, sustainability emerges as an imperative consideration that warrants attention. Sustainability within the context of the digital age is frequently conceptualized as alleviating the environmental repercussions associated with technology utilization; however, an increasing number of scholarly investigations are beginning to associate sustainability with digital methodologies aimed at developing more ecologically sustainable products whilst enhancing competitive advantage. In this investigation, it is observed that despite the extensive body of literature correlating sustainability with operational efficacy or the diminution of carbon emissions, there exists a paucity of research that explores how digital technology can proactively assist enterprises in formulating more sustainable products while concurrently augmenting their competitiveness within the international marketplace (Diez-Martin et al., 2019; Remondino and Zanin, 2022). Consequently, there is a substantial void for additional inquiry into how organizations can integrate technological innovations with sustainability principles to establish a sustainable competitive advantage.

It is crucial to acknowledge that although digital technologies facilitate organizations in realizing enhanced cost efficiencies and providing products of superior value, the obstacles encountered by small and medium-sized enterprises (SMEs) in developing nations in integrating these technologies remain significantly constrained. Frequently, SMEs in developing nations confront infrastructural impediments, resource limitations, and disparities in technology adoption (Crick et al., 2018). Additional scholarly inquiry is required to elucidate mechanisms to reconcile the digital divide between developed and developing nations and provide strategic guidance that may assist SMEs in the global marketplace (Wu et al., 2024). Accordingly, it is essential to conduct a more profound investigation into the context of implementing digitalization within sectors still nascent in technology adoption, which frequently receive inadequate attention in existing literature.

Moreover, notwithstanding the extensive corpus of literature regarding technology adoption within the business realm, the interplay between product value and sustainable competitive advantage within the digital milieu remains inadequately examined in an integrative fashion (Andrade and Gonçalves, 2021; Bughin, 2023). Most existing investigations concentrate on each subject in isolation, failing to analyze how these two elements interact to yield a superior strategic framework for businesses. Given the swift evolution of technology and shifts in consumer preferences,



companies must cultivate a more comprehensive insight into integrating these two constructs within a synergistic strategic approach. In forthcoming research endeavors, a more holistic and interdisciplinary perspective will prove invaluable for devising business models capable of sustaining competitive advantage while enhancing the value of products provided to consumers.

A thorough exploration is crucial to understanding the role of artificial intelligence (AI), big data, and the Internet of Things (IoT) in evolving products and services that address consumers' functional demands while fostering emotional and societal relevance. Although most of these technological advancements have demonstrated enhancements in operational efficiency, the enduring repercussions of their integration on consumer perceptions and customer allegiance necessitate comprehensive scrutiny. This inquiry is crucial as customer allegiance cultivated through robust emotional ties with products and brands may be pivotal in establishing a sustainable competitive edge within an increasingly digital and interconnected marketplace.

Overall, notwithstanding considerable advancements in this domain, numerous aspects necessitate further exploration, particularly concerning the interplay between product value and sustainable competitive advantage. Future inquiries should emphasize the mechanisms by which digital technologies enhance not only the cost efficiency and functional value of products but also incorporate emotional and social dimensions in formulating pertinent and sustainable market offerings. Investigations that scrutinize the synergies among diverse digital technologies and their ramifications on sustainability will prove invaluable in establishing strategic directives for organizations aspiring to preserve their competitive edge over the long term.

## 5. CONCLUSION

This research elucidates how product value and sustainable competitive advantage have transformed in response to the swift digital metamorphosis occurring within the commercial landscape. As digital advancements unfold, featuring Artificial Intelligence (AI), the Internet of Things (IoT), and blockchain systems, companies must capitalize on these trends to boost product value and maintain a sustainable competitive advantage. Although traditionally assessed through its functional attributes, this manuscript underscores that product value increasingly incorporates emotional and social dimensions that significantly influence consumer loyalty and engagement. Consequently, organizations must integrate all facets of product value within their strategic frameworks to foster a more robust competitive advantage. Moreover, sustainability is progressively recognized as a pivotal theme surrounding digital products and competitive advantage.

A considerable body of literature has concentrated on mitigating the ecological ramifications of digital technology deployment; however, scant attention has been directed toward investigating the potential of these technologies to engender more sustainable products and bolster long-term competitiveness. Thus, a critical need exists for a comprehensive inquiry into how enterprises can

amalgamate digital technologies with sustainability principles, not merely to diminish environmental repercussions but also to devise products that offer enhanced value to consumers and align with sustainable development objectives. A significant outcome from this inquiry emphasizes the necessity for ongoing research into the application of digital technologies in developing countries and within the SME sector. Despite the substantial promise that digital technologies hold for enhancing competitiveness, numerous organizations in developing regions encounter challenges related to infrastructural deficits, resource limitations, and disparities in technological adoption. For this reason, a distinctive strategy is key to supporting the integration of digital technologies within SMEs in developing countries while addressing the varied local realities against their developed counterparts.

In summation, while numerous scholarly works have examined product value and competitive advantage in isolation, this study accentuates the significance of synthesizing these two constructs into a more holistic framework. Expansive dimensions of product value, encompassing functional, emotional, social, and economic values, should be integrated into business strategies to cultivate sustainable competitive advantages. Further investigation into the interconnections between digital technologies, sustainability, and the diverse dimensions of product value is warranted to assist firms in addressing global challenges and sustaining their competitive viability over the long term.

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