Electronic Banking Services and Customer Satisfaction: A Bibliometric Analysis and Future Research Directions

Rahmanwali Sahar[1,2]*, Masoud Nikzad[1], Shuakat Rahman Ansari[1]

[1] Master of Management, Postgraduate Program, Universitas Muhammadiyah Yogyakarta, 55183 Yogyakarta, Indonesia
[2] Department of Business & Administration, Institute of Higher Education Mirwais Khan Nika Zabul, 4001 Qalat GPO, Afghanistan

* Correspondence: Rahmanwali Sahar (rahmansahar034@gmail.com)

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Abstract: A bibliometric analysis of research on electronic banking (EB) services and customer satisfaction has been conducted using 124 publications indexed in the Scopus database from 1999 to 2024. The study employs VOSviewer and Microsoft Excel to identify key trends, scholarly contributions, and thematic clusters within the literature. Findings indicate a significant surge in research output since 2019, with India emerging as the most prolific contributing country. The *International Journal of Bank Marketing* is identified as the leading publication venue, while Kumar, P. is recognized as the most frequently published author. Institutional contributions are led by the University of Delhi. Co-occurrence and bibliographic coupling analyses reveal five dominant research clusters: customer satisfaction, EB, electronic customer relationship management (e-CRM), customer loyalty, and sales. Furthermore, critical research linkages and evolving thematic patterns are highlighted, underscoring the dynamic nature of this research field. Several research gaps are identified, particularly regarding the integration of emerging financial technologies, regulatory impacts, and cross-cultural variations in EB adoption. The study offers theoretical and practical implications for scholars, financial institutions, and policymakers. Limitations, including database constraints and methodology scope, are acknowledged, providing a foundation for future investigations. The findings contribute to a deeper understanding of the evolving interplay between EB services and customer satisfaction, paving the way for further empirical and conceptual advancements.

Keywords: Electronic banking (EB) services; Customer satisfaction; Bibliometric analysis; VOSviewer financial technology; E-CRM; Customer loyalty

1. Introduction

The development of EB, defined as the delivery of banking services via electronic channels, enables customers to engage in online banking, use ATMs, and access services via mobile devices (Dangaiso et al., 2024; Basu et al., 2024). Rapid technological advances and the Internet revolution have impacted banking operations, service delivery, and customer relationships and allowed a significant transition from physical transactions to digital solutions (Chauhan et al., 2022a). The emergence of EB at the beginning of the 20th century followed the introduction of ATMs, which allowed banks to facilitate fundamental cash transactions outside traditional branch hours. In addition, the emergence of Internet and mobile banking in 2000 was a significant advancement since it included real-time transactions and customer support in banking apps (Singh & Srivastava, 2020). This advancement has introduced various banking channels, including phone banking, SMS notifications, and digital applications, that cater to the increasing population of technologically adept customers. This digital transformation has diminished operational costs and enabled banks to enhance efficiency, volume, and service accessibility (Jebarajakirthy & Shankar, 2021). EB has emerged as the primary approach, with numerous customers using daily financial services. The selection of banking services via Internet and mobile platforms for transactions, including bill payment, money transfer, and account inquiries (Chauhan et al., 2022b), is mainly pushed by convenience,

speed, and the capacity to access services from any location (Ananda et al., 2020). Nonetheless, this acceptance presents obstacles, particularly in monitoring customer satisfaction and securing customer loyalty, as competition within the banking industry intensifies (Chaimaa et al., 2021; Lin et al., 2020).

Customer satisfaction has been a primary emphasis in EB because of its direct relationship with customer loyalty, retention, and public interest. Ayinaddis et al. (2023) argue that customer satisfaction is significantly affected by the usability, dependability, and security of EB systems in the digital world. In contrast to conventional banking, where a personal touch can reduce customer complaints, EB focuses only on the functioning and design of digital systems. Technical failures, extended processing delays, or recognized weaknesses may swiftly dissatisfy customers and force potential customers to engage with banks (Arif et al., 2020; Esmaeili et al., 2021; Rahi et al., 2020). Customer satisfaction with EB is closely linked to the quality of e-services. Raza et al. (2020) argue that service quality is essential for customer satisfaction in digital banking, with dependability, responsiveness, and assurance being important factors. Digital banking systems must ensure quick and accurate transactions while offering rapid customer service to address difficulties efficiently. This is particularly significant since EB customers anticipate rapid access and faster resolutions compared to conventional banking.

In recent years, extensive empirical research has been done regarding EB services and customer satisfaction, including elements such as EB service quality, determinants of satisfaction and loyalty, and EB practices (Gautam & Sah, 2023; Hammoud et al., 2018; Indrasari et al., 2022). This has led to a significant body of literature on EB. Through an extensive literature analysis, researchers can thoroughly understand EB services and the customer satisfaction sector.

Previous bibliometric studies of EB, such as the study by Mintah et al. (2024), analyzed academic publications on EB over three decades. This study evaluates the conceptual framework and trends while highlighting the new potential in EB research. A bibliometric analysis was performed on 2,391 research publications in the EB field using data from the Scopus database. The publications received examination and integration through volume analysis, citation analysis, authorship analysis, collaboration assessment, co-citation analysis, and keyword co-occurrence analysis. Furthermore, Bonang et al. (2024) provide a bibliometric analysis of service quality and customer satisfaction in Islamic banking as the basis for further research. This study aims to conduct a comprehensive bibliometric analysis of research concerning service quality and customer satisfaction in Islamic banking, classifying the data into three main fields: productivity, citation trends, and network analysis.

The current study could not find a bibliometric analysis of EB services and customer satisfaction, nor did it take on a complete bibliometric examination of EB services and customer satisfaction studies. To fill this gap, this bibliometric approach is essential for providing an advanced perspective, understanding the progression of literature from conceptual confusion to theoretical investigation, and defining the primary constructs and relationships between them (Zainuldin & Lui, 2022). Moreover, the progression of literature involves the cooperation among researchers that forms the research community for creating and distributing knowledge (Biancone et al., 2020). Consequently, it is essential to understand the evolution of collaboration among scholars, institutions, and countries from varied backgrounds. The application is very beneficial to researchers and theorists in the scientific field.

Furthermore, from a theoretical perspective, the study is grounded in technology adoption models, service quality frameworks, and customer satisfaction theories that help explain the dynamics of EB services and customer experiences. Understanding the evolution of these themes through bibliometric analysis allows for identifying key contributors, leading institutions, and dominant research trends. Practically, the study addresses the growing reliance on digital banking and the necessity for financial institutions to enhance service quality, security, and customer trust. Exploring the main themes within the conceptual framework helps identify critical determinants of customer satisfaction and areas for future development. This study provides valuable insights into potential advancements in EB services and customer engagement strategies by mapping existing research and highlighting gaps.

Q1. What is the domain of EB and customer satisfaction research?

Q2. Who are the leading contributors, authors, affiliations, journals, and countries in EB services and customer satisfaction?

Q3. What are the main themes and topics within the conceptual framework of EB services and customer satisfaction?

Q4. Where else can future research contribute to EB service and customer satisfaction?

The primary objective of this research is to delineate the intellectual progression and knowledge framework based on publication trends while examining the research patterns of sources, documents, authors, institutions, and countries. Additionally, it aims to identify the major topics within the intellectual structure of EB and customer satisfaction, contributing to future research in this field.

This study will significantly improve conformity with the expected results of a bibliometric analysis. This study makes a theoretical contribution by using bibliometric analysis to uncover the intellectual structure of EB services and customer satisfaction research. Identifying key authors, influential studies, and thematic clusters provides a comprehensive view of how this field has evolved. The bibliometric results offer deeper insights into the theoretical

underpinnings of customer satisfaction in digital banking by mapping the dominant frameworks, such as the Technology Acceptance Model (TAM), SERVQUAL, and Trust-Based Theories. Understanding the citation patterns and co-authorship networks helps reveal how different perspectives on service quality, usability, security, and customer loyalty have been developed and interconnected over time. This approach consolidates existing knowledge and highlights gaps where future theoretical advancements can refine models related to digital banking experiences and consumer behaviour. This research will address insights from the performance (including publication trends, leading institutions, authors, articles, countries, and highly cited articles) and intellectual structure (including key concepts and topics) related to EB and customer satisfaction. This study will enhance future research by allowing for more efficient identification and integration of new contributions with existing ones. Future research may identify the specific field of EB service quality and its correlation with customer satisfaction and loyalty, as well as the primary focus of their study and its contribution to enhancing the current understanding within this field. This study will encourage future research by using the insights obtained from the present review to its recommended agenda. This study will highlight critical gaps in existing research that future investigations may address to ensure the importance and relevance of EB and customer satisfaction.

2. Research Methodology

The researchers used bibliometric analysis and VOSviewer software to attain the research objectives. Bibliometric methods evaluate and define researchers' publications based on citation frequencies (Donthu et al., 2021), using each article as the central unit of analysis (Lancho-Barrantes & Cantú-Ortiz, 2019). Furthermore, the bibliometric analysis enables the investigation of research trends (Tandon et al., 2021), potential research questions (Arshad Khan & Alhumoudi, 2022), and critical components (Zhang et al., 2019) within the literature. Moreover, the bibliometric study could identify research gaps and guide future studies on the growing topic (Patel & Siddiqui, 2023). Furthermore, compared to the traditional structured approach, the bibliometric technique can handle extensive articles to establish a scientific framework for research issues (Tuli, 2024).

2.1 Data Collection and Screening Procedure

Step 1. Three hundred thirty articles were identified in the Scopus database in November 2024, using all relevant keywords such as EB Services, EB Services, and Customer Satisfaction.

Step 2. In the second phase, we limited the subject area to business management and economics, obtaining 181 articles. Subsequently, we restricted the selection to English-language publications, resulting in 124 articles.

Step 3. In the third phase, these articles were extracted from Scopus and added to a CSV file.

Step 4. The data were organized, displayed, developed, and evaluated using the VOSviewer program in the fourth phase. This program was used to develop quantitative and qualitative measures that would facilitate our understanding of the productivity and impact of the scientific literature (Shah et al., 2020).
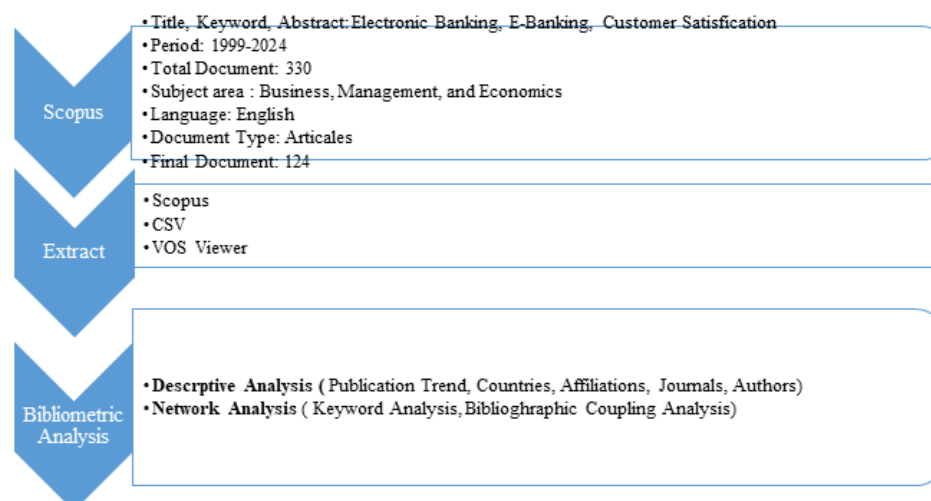
Scopus
- Title, Keyword, Abstract: Electronic Banking, E-Banking, Customer Satisfication
- Period: 1999-2024
- Total Document: 330
- Subject area : Business, Management, and Economics
- Language: English
- Document Type: Articales
- Final Document: 124

Extract
- Scopus
- CSV
- VOS Viewer

Bibliometric Analysis
- Descrptive Analysis (Publication Trend, Countries, Affiliations, Journals, Authors)
- Network Analysis (Keyword Analysis, Biblioghraphic Coupling Analysis)

Figure 1. Data screening and analyzing process

Step 5. The 5th phase of this investigation included bibliometric indicators, including descriptive analysis, number of publications (journals, authors, affiliations, countries), network analysis, research trends (keyword analysis), and collaboration trends (bibliographic coupling analysis). Figure 1 presents the data collection and screening procedure.

3. Result and Discussion

This study includes two primary analyses: starting source descriptive and network analysis. The critical description concludes the source, States Starting source. The study concludes with the source. Using productivity indicators, including essential information relevant to the current literature, and the network analysis explores the study's length by finding hidden predictive linkages within the literature rather than only providing the database data. The scientific mapping of network analysis facilitates the identification of objectives and patterns within the literature (Zainuldin & Lui, 2022).

3.1 Descriptive Analysis

This section investigates the descriptive analysis of components such as the 25-year publication timeline, leading journals, authors, research institutions, papers, and countries. Figure 2 illustrates the volume of publications from 1999 to 2024, with the first article published in 1999 indicating the initial entry into this field of study. Research on EB and customer satisfaction has steadily risen since 2019, with a significant increase starting in 2022. In recent years, there has been an important rise in the literature about EB and customer satisfaction, attracting considerable corporate and academic attention (Tahtamouni, 2023). The increase in publications may be related to the quick growth of digital financial services and fintech, requiring traditional banks to provide EB services, leading to an enhanced understanding of customer satisfaction in the age of technology (Ananda et al., 2020).
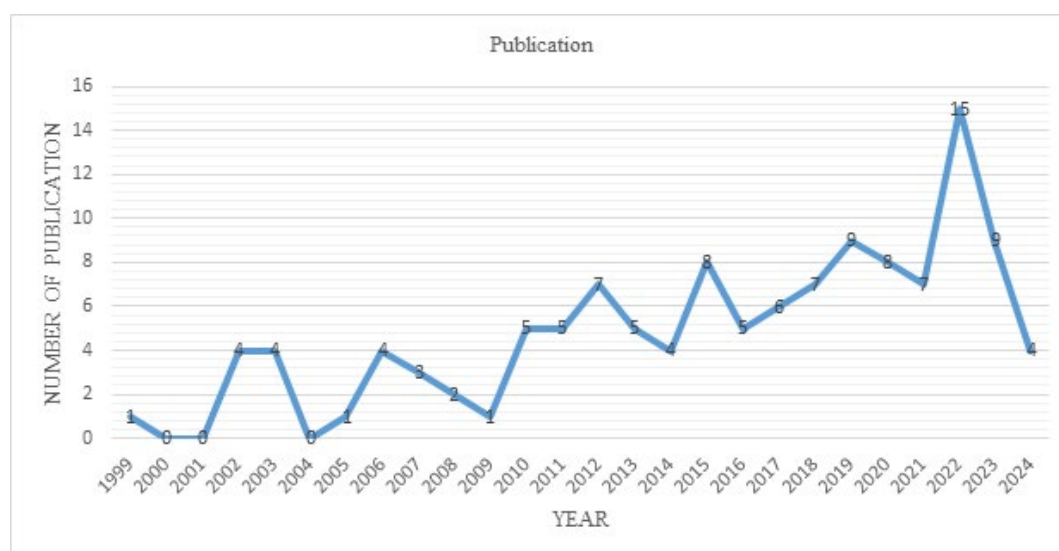

Figure 2. Publication trend from 1999 to 2024
Source: Scopus database

Digitally, customers want rapid, safe, and tailored experiences from banks; this expectation requires a study to determine the factors influencing satisfaction and loyalty, including ease of use, safety, accessibility, and support (Ighomereho et al., 2023). Consequences of COVID-19 The epidemic has caused many individuals to give up face-to-face banking for the convenience of EB, necessitating enhancements in the online banking experience, addressing customer concerns, and successfully fulfilling user requirements (Alarifi & Husain, 2023). The accessibility of information about customers via digital channels enables researchers to monitor customer behaviour and preferences, while advanced analytics, including artificial intelligence and machine learning, enhance comprehensive studies on EB satisfaction (Arshad Khan & Alhumoudi, 2022). Competition in digital banking has driven banks to enhance their understanding of customer satisfaction. Investigations in this domain enable banks to distinguish themselves from competitors and enhance service quality (Kashyap et al., 2024), with regulatory emphasis on customer experience. As digital banking expands, authorities focus on protecting customers' rights and ensuring satisfaction. Research in this domain assists banks in complying with rules while improving service quality (Kaur et al., 2021).

Table 1 presents the ten leading journals with the highest volume of published articles about EB and customer satisfaction in the banking sector over 25 years. The top 10 journals distributed over 33% of all articles regarding EB and customer satisfaction in the banking sector, including 42 articles out of 124 publications. The International Journal of Bank Marketing has published 11 papers, while the International Journal of Electronic Customer Relationship Management and Banks and Bank Systems have published 5 and 4 articles.

Table 1. Top contributing journals

Journal	Publication	Percentage
International Journal of Bank Marketing	11	9%
International Journal of Electronic Customer Relationship Management	5	4%
Banks and Bank Systems	4	3%
International Journal of Information Management	4	3%
International Journal of Scientific and Technology Research	4	3%
TQM Journal	4	3%
International Journal of Business Information Systems	3	2%
Journal of Internet Banking and Commerce	3	2%
Cogent Business and Management	2	2%
Electronic Commerce Research and Applications	2	2%

Source: Author (Scopus database)

Respectively, the International Journal of Bank Marketing is an internationally recognized journal abstracted and indexed by numerous sources, and Emerald Group Publishing issues it with an impact factor of 10.7 citation score. Furthermore, the other ten notable journals, such as IJECRM, Banks and Banks Systems, and IJIM, are similarly listed in the Quartile Score and listed in Scopus. The IJECRM is indexed in Scopus (Elsevier), Academic OneFile (Gale), cnpLINKer (CNPIEC), OneFile Business (Gale), and Google Scholar, and has been assessed in the ACPHIS (Australia) IS Journal Ranking and the National Agency for Evaluation of the University and Research System (ANVUR).

Next, Table 2 defines the ten leading authors with the most papers on EB and customer satisfaction within the banking sector. Kumar, P., and Mokha, A.K. are the two authors with the most significant publication count, each having authored four articles, while the other authors in the top 10 have each published two papers.

Table 2. Top contributing authors

Author	Publication	Percentage
Kumar, P.	4	3%
Mokha, A.K.	4	3%
Al-Dmour, H.H	2	2%
Al-Dmour, R.H.	2	2%
Govender, K.K.	2	2%
Hitt, L.M.	2	2%
Karjaluoto, H.	2	2%
Krairit, D.	2	2%
Kundu, S.	2	2%

Table 3. Top contributing affiliations

Affiliation	Country	Publication	Percentage
University of Delhi	India	4	3%
Kirori Mal College	India	4	3%
University of KwaZulu-Natal	South Africa	3	2%
Multimedia University	Malaysia	3	2%
Islamic Azad University	Iran	3	2%
The University of Jordan	Jordan	3	2%
Delhi School of Economics	India	3	2%
Jesuit Historical Institute inAfrica	Kenya	2	2%
University of Johannesburg	South Africa	2	2%
Ferdowsi University of Mashhad	Iran	2	2%

Source: Author (Scopus database)

The top 10 authors published 24 papers, accounting for almost 12% of the total publications. Authors with fewer publications are seen to be in a developmental phase and are not regarded as dominating authors. The findings suggest that researchers in this field are still in the early stages of growth; nonetheless, these authors have shown their knowledge by publishing a significant volume of research over the last two decades.

Table 3 defines the ten leading research institutions that published the most papers about EB and customer satisfaction in the banking sector. The top 10 research institutes are the University of Delhi and Kirori Mal College, with four published publications. The University of KwaZulu-Natal, Multimedia University, Islamic Azad University, the University of Jordan, and the Delhi School of Economics produced three publications. In contrast, the Jesuit Historical Institute in Africa, the University of Johannesburg, and the Ferdowsi University of Mashhad produced two publications. The top 10 affiliations provide 29 articles, accounting for around 17% of the

publications concerning EB and customer satisfaction in the banking sector.

These findings fit with those of the ten leading authors, suggesting that most affiliations engaged in EB and customer satisfaction research within the banking sector are still early, as shown by the restricted publication number, ranging from 1 to 4. It emphasizes that over 50 per cent of the top 10 research institutions are in three countries. These are India, Iran, and South Africa. The policies of all three countries show similarities since their authorities have established strict standards for sustainability reporting, perhaps resulting in increased studies on social responsibility concerns in the banking sector.

Table 4 shows the ten countries with the most published articles over 25 years. The top 10 countries have produced 81 of 124 papers, or 71% of the total publications. India, Iran, and the United States each provide a minimum of 10. India, Iran, and the United States contribute significantly to research on EB services and customer satisfaction due to their strong academic networks, technological advancements, and banking sector developments. India's rapidly growing digital economy and financial inclusion initiatives drive extensive research in this area. Iran's focus on service quality and customer trust in banking, influenced by regulatory and economic factors, encourages scholarly contributions. The United States, with its well-established banking infrastructure and fintech innovation, has led in research on digital banking security, customer experience, and financial technology adoption. These countries' research contributions reflect their unique economic and technological landscapes, shaping global perspectives on EB and customer satisfaction. This fits with the analyses of the outcomes from the ten leading research institutes, indicating that the institutions from India, Iran, and South Africa generated the most significant number of publications about EB and customer satisfaction in the banking sector.

Table 4. Top contributing countries

Country	Publication	Percentage
India	20	16%
Iran	15	12%
United States	12	10%
Jordan	8	6%
South Africa	8	6%
Malaysia	6	5%
United Kingdom	6	5%
Nigeria	5	4%
Thailand	5	4%
Saudi Arabia	4	3%

The study on EB and customer satisfaction in the banking sector has a balanced representation of developed and developing countries from the list. Consequently, it demonstrates that banks in both wealthy and developing countries perform equally significant societal responsibilities. Furthermore, the top countries on the list fit with the primary relationships and authors of Table 2. It indicates that, among the leading countries in research, other countries are linked to institutions and authors who make significant contributions to the same field of study. For example, the University of Delhi (India), Kirori Mal College (India), University of KwaZulu-Natal (South Africa), Multimedia University (Malaysia), and Islamic Azad University (Iran). This outcome indicates that the data inside the Scopus database is sufficiently reliable and strong for future bibliometric and network studies. This indicates that the study may use Scopus data to research topics and their interrelations comprehensively

3.2 Network Analysis

Network analysis is a methodology that examines the interactions and connections among articles. It emphasizes co-authorship, frequently used terms, citations, bibliographic links, and standard references. This is used to comprehend the relationship between studies and their authors (Lestari & Wiryono, 2023; Galletta et al., 2022). As stated in Section 2, network analysis is an advanced method that successfully defines the intellectual and social framework of the EB and customer satisfaction literature related to the banking sector.

3.2.1 Co-word analysis

Refers to a gathering of co-occurring terms extracted from articles related to an area of study (Kumar et al., 2022b). The ongoing occurrence of keywords signifies the research topics of the publications (Tounekti et al., 2022) and investigates the interrelations and trends of related sub-disciplines (Galletta et al., 2022).

Table 5 presents the ten main keywords extracted from the overall link strength of co-word analysis. The total strength connection indicates the degree of correlation between the item in question and other commodities. It illustrates the intensity of the interaction between organizations and the degree of their interconnection (Zainuldin & Lui, 2022). *Customer satisfaction* has a significant connection with complete strength since it is crucial for banks to maintain customer contentment and fulfilment. Content customers show loyalty and share positive

information about goods and services, thus enhancing the company's performance and connections with other organizations (Li et al., 2021). The second keyword, *Electronic Commerce*, relates to customer satisfaction. In EB, customer satisfaction and e-commerce are linked because an enhanced e-commerce experience encourages customer convenience and time efficiency. If EB is quick, dependable, and user-friendly, it improves customer satisfaction, leading to repeated service use (Mansour et al., 2022). The third key term is *Sales*; in EB, the correlation between sales and customer satisfaction is that enhanced customer satisfaction contributes to increased sales. Customers content with EB obtains more services and products, resulting in a higher sales rate (Nazaritehrani & Mashali, 2020). The fourth term is *EB*, with studies by Raza et al. (2020) indicating that EB positively and significantly influences user satisfaction, positively affecting customer loyalty. Among the ten most commonly used terms, *Customer satisfaction* has the highest frequency, underscoring its significance in modern words.

Table 5. Co-occurrence analysis of keywords

Keyword	Co-Occurrence	Total Link Strength
Customer satisfaction	58	204
Electronic commerce	25	119
Sales	13	82
Internet banking	16	63
Internet	11	58
Banking	16	57
Customer loyalty	13	54
Quality of service	7	50
Electronic banking	14	45
Quality	16	45

Source: Author (Scopus database, VOSviewer)

Numerous research studies indicate that customer satisfaction in EB is essential for securing long-term profitability and sustainability for financial institutions. Ayinaddis et al. (2023) argue that if a bank's e-services are efficient, rapid, and dependable, clients will persist in using such services and will be preferred over rival banks. Moreover, maintaining a high customer satisfaction rate in digital banking is crucial for consistently attracting new clients and retaining existing ones, allowing banks to maintain an advantage in the market (Son et al., 2020). Rising customer satisfaction enhances the bank's reputation and market recognition, which is vital for long-term revenue and economic growth (Supriyanto et al., 2021). Other common topics are Internet banking, customer loyalty, and service quality; both EB and service quality are essential since they significantly contribute to the success of EB and customer satisfaction. Online banking enables banks to provide customers with a convenient and rapid service experience, enhancing customer loyalty and establishing a long-term connection with the institution (Baabdullah et al., 2019). The quality of the bank's service is crucial since customers want trust and a positive experience; superior service may encourage customer loyalty. Likewise, excellent service quality enhances the bank's reputation and competitiveness, which are crucial for customer retention and overall success.

Figure 3 illustrates the network visualization of prevalent keywords obtained from co-word analysis. Consistent with the results shown in Table 6, the customer satisfaction theme includes a significant cluster demonstrating a considerable correlation with the EB sector. Additionally, five notable clusters show significant relationships among different word combinations. The customer satisfaction cluster is integrated with the electronic commerce, online banking, internet, finance, and information technology clusters. Consequently, these elements collaborate to enhance customer experience and convenience; the emergence of digital banking and Internet technology has significantly expedited online banking and financial transactions, leading to increased customer satisfaction (Raza et al., 2020; Sharma & Sharma, 2019). Moreover, information technology significantly contributes to the efficiency of information security and services in EB, enhancing customer satisfaction by providing convenient and dependable financial services (Ahmed et al., 2021). Consequently, these components collaborate to guarantee that customers experience modern and accelerated services, leading to enhanced customer satisfaction.

The EB cluster includes trust, satisfaction, loyalty, online banking, and e-service quality; consequently, customers' trust and loyalty in online banking are enhanced when they receive reliable and high-quality services that effectively address their needs (Alhanatleh, 2021; Mulia et al., 2021). Furthermore, the quality of e-services is crucial in enhancing customer satisfaction and delivering rapid and efficient services to enhance customer retention and encourage repeated use of EB services (Kashyap et al., 2024). Consequently, trust, loyalty, and service quality all contribute significantly to the success of EB and customer satisfaction

The e-CRM cluster is linked to customer satisfaction, banks, the banking sector, and customer experience. Consequently, this integrated method enables banks to enhance relationship management and sustain lasting relationships. E-CRM enhances the understanding of consumer needs and delivers customized offerings, enhancing customer satisfaction and retention (Kumar et al., 2022a). Furthermore, in the banking sector, e-CRM prioritizes enhancing the customer experience since these technologies provide superior management of customer relationships and speed responses to inquiries, providing long-term advantages for banks (Mokha & Kumar, 2021).

A significant correlation exists between e-CRM and customer satisfaction and experience, which enhances the banks' value.
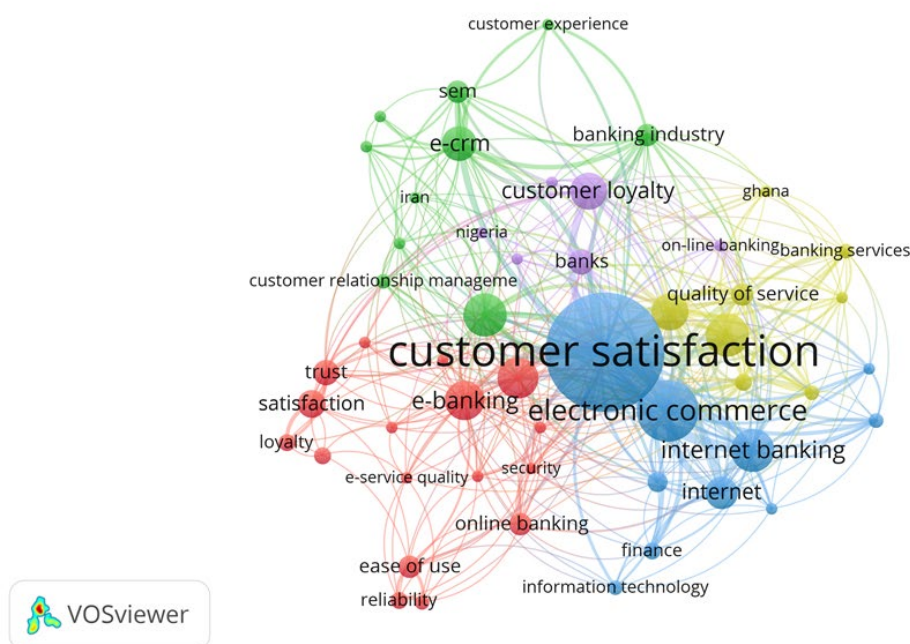

Figure 3. Network visualization of keyword
Source: Author (Scopus database, VOSviewer)

The customer loyalty cluster is integrated with banking and online banking services. These three components create strong relationships with customers and loyalty. Online banking offers ease to customers regarding time and delays, significantly enhancing their trust and loyalty, as people want to stay loyal to a bank that effectively addresses their demands (Gautam & Sah, 2023). Consequently, banks develop customer loyalty via online banking and maintain a leading position in the competitive market.

The sales cluster is linked to financial services and the quality of service. Consequently, banks maintain excellent service quality and effectively address consumer needs, resulting in increased revenues due to enhanced customer satisfaction and loyalty (Supriyanto et al., 2021). Superior services incentivize customer utilization. Banking services, which in turn lead to increased bank sales and enhanced market competition (Fida et al., 2020).

3.2.2 Analysis of bibliographic coupling

Bibliographic coupling occurs when two articles have the same reference (Hassan et al., 2023). The purpose of evaluating bibliographic coupling is to identify current studies within a topic, offering a dynamic approach to analyze the conceptual framework of the area (Mintah et al., 2024).

Table 6 presents the ten most cited articles identified using bibliographic coupling analysis, ranked by total citations. These ten studies indicated that several publications used them as references for research on EB and customer satisfaction within the banking sector. The study conducted by Suh & Han (2002) has an outstanding citation index and may provide a novel pathway for investigating characteristics that enhance customer acceptance of Internet banking. A comprehensive analysis of 845 cases conducted via a web survey on user behaviour towards Internet banks reveals that trust significantly influences the acceptability of Internet banking, as shown by statistical analyses using structural equation modelling. Additionally, research by Casaló et al. (2008) suggests alternative ways for investigation; an interesting area for further study would involve analyzing the influence of innovative internet access methods (e.g., mobile phones) on customer loyalty and positive word-of-mouth in the context of interactions between individuals and banks through these emerging technologies. The findings derived from the validation of measurement scales include in-conflict hypotheses via structural modelling. This research revealed that satisfaction with previous experiences on the bank's website positively impacted customer retention and favourable word-of-mouth. Moreover, website usability was recognized as positively influencing customer satisfaction, and, as expected, loyalty was significantly correlated with favourable word-of-mouth.

The study by Nasri & Charfeddine (2012) provides a novel direction for future research by comparing users across different age demographics. This Research empirically examines the determinants affecting the adoption of

EB among Tunisian banking customers. This research uses the technological acceptance model (TAM) and the theory of planned behaviour (TPB) as its core frameworks. The results urge bank managers to develop strategies that enhance the use of Internet banking. Financial institutions must enhance security and privacy measures to protect customers' personal and financial data, enhancing user trust. The government needs to support the banking sector by adopting clear and strict rules, therefore enhancing customer confidence in Internet banking, enhancing Internet infrastructure, and encouraging online banking services. The research by Karjaluoto et al. (2019) developed and assessed a series of hypotheses on the antecedents of perceived value in the use of MFSA; it also examined the effect of such use on the development of customers' comprehensive relationships with banks. The study's assumptions were assessed using two samples (N = 992; N = 524), including diverse types of MFSA end-users in Finland, a significant country in digital banking. The results corroborated all predictions and demonstrated that self-awareness and product innovation are the primary determinants of perceived MFSA value. The findings demonstrate that the perceived value of MFSAs significantly enhances customers' overall pleasure and loyalty to their bank.

Table 6. Bibliographic coupling analysis

Title	Author	Citation	Conclusion	Directions for Future Studies
Effect of Trust on Customer Acceptance of Internet Banking	Suh & Han (2002)	616	1-The research identifies trust as a significant determinant in the acceptance of Internet banking. It emphasizes that trust influences customer attitudes more than perceived ease of use, highlighting its importance in the digital banking context. 2-Impact on user behavior: Statistical analyses using structural equation modelling reveal that trust substantially impacts users' acceptance of Internet banking. This suggests that fostering trust can increase the usage and acceptance of online banking services. 3-The study extends the TAM by incorporating trust as an additional belief that affects user behaviour. This indicates that traditional beliefs like ease of use and usefulness may not fully capture the complexities of user acceptance in Internet banking. 4-The research involved a diverse sample of 845 respondents, with a balanced gender distribution and a majority in their twenties or thirties. This demographic insight helps in understanding the target audience for Internet banking services. 5-Recommendations for Practitioners: Internet banking practitioners are encouraged to enhance the trustworthiness of their platforms. This can be achieved by implementing robust security measures and communicating these to users, thereby increasing public trust in their services.	Other Research exploring these aspects might improve the comprehension of the customers' acceptance of Internet banking.
The role of satisfaction and website usability in developing customer loyalty and positive word-of-mouth in EB services	Casaló et al. (2008)	312	1-Empirical contribution: The research addresses a gap in empirical studies regarding customer loyalty and positive WOM in the e-banking context, highlighting the importance of these concepts in the digital banking landscape. 2-Importance of WOM: The analysis emphasizes that WOM is particularly significant in service contexts like e-	First, an interesting path for further investigation would be examining the impacts of new

			banking due to the intangibility of services and the associated perceived risks. Customers tend to trust information from fellow customers more than from other sources.

3-Link Between Satisfaction and Loyalty: The findings reveal a strong connection between customer loyalty to a financial services website and satisfaction derived from previous interactions. This aligns with existing marketing literature that supports the relationship between these two constructs.

4-Determinants of Positive WOM: The study identifies perceived customer loyalty and satisfaction as critical factors influencing the development of positive WOM in the e-banking sector. This suggests that satisfied customers are more likely to share positive experiences.

5-Role of Usability: An important finding is that the perceived usability of the website indirectly influences customer loyalty and positive WOM through satisfaction. Usability enhances customer satisfaction by meeting their needs for website manageability, leading to increased loyalty and positive WOM.

6-Mediating Role of Satisfaction: The research confirms the mediating role of Satisfaction in the relationship between usability, customer loyalty, and positive WOM, providing a new perspective on how these factors interact in online banking.

7-Impact on Business Outcomes: The study concludes that enhancing customer satisfaction and perceived usability can significantly affect customer behaviour, influencing their preferences for future interactions and their likelihood to recommend the bank to others. This can ultimately impact the profitability of the bank. | internet access technologies (e.g., mobile phones, etc.). Secondly, it would be good to conduct the research with more customers. |
| Factors affecting the adoption of Internet banking in Tunisia: An integration theory of acceptance model and theory of planned behaviour | Nasri & Charfeddine (2012) | 241 | 1-Extended Model Development: The research successfully developed an extended TAM integrated with the Theory of Planned Behavior (TPB). This model enhances the understanding of factors influencing Internet banking adoption in Tunisia, particularly in a developing country context.

2-Predictive Power: The findings indicate that the proposed model has strong explanatory power and is robust in predicting customers' intentions to use Internet banking. This suggests that the model can effectively identify the factors that contribute to the success of Internet banking in Tunisia. | First, Future research may examine other aspects that impact the adoption of Internet banking services. Second, Future researchers may thus compare users across |

				various age groups for further studies.

3-Limitations Identified: The study acknowledges several limitations:

- 3.1-The selected factors may not encompass all possible influences on Internet banking adoption. Future research could explore additional factors that might affect this adoption.
- 3.2-The demographic profile of the respondents was predominantly young, with most being college or university graduates. This raises questions about the generalizability of the findings to older age groups or non-users of Internet banking.
- 3.3- The sample consisted solely of Internet banking users, which limits insights into the perspectives of non-users or dormant users.

How perceived value drives the use of mobile financial services apps.	Karjaluoto et al. (2019)	221		First, future research should investigate causal relationships between the variables using an experimental and/or longitudinal approach to provide comprehensive causal insights. Second, Future studies could expand our model and include other factors. Third, we recommend that future scholars in the field of MFSAs investigate different countries.

1-Influence of Key Predictors: The research identifies four main predictors of perceived value: personal innovativeness (PI), self-congruence (SC), perceived risk (PR), and new product novelty (NPN). Among these, SC and NPN are highlighted as the primary drivers of perceived value in the MFSA context.

2-Differential Impact of Perceived Risk: The study finds that perceived risk has a more significant impact on perceived value for mobile banking users than mobile wallet users. This suggests that the type of mobile financial service influences how users perceive risk and value.

3-Drivers of Satisfaction and Commitment: The findings indicate that utilitarian value is the primary driver of overall satisfaction. In contrast, hedonic value is a stronger predictor of customer commitment to their service providers. This distinction is crucial for banks and service providers aiming to enhance customer relationships.

4-Contribution to Literature: This study is significant as it is one of the first to explore these effects among experienced MFSA users in a mature market, specifically Finland. It adds to the existing literature by providing empirical evidence on the relationship between perceived value and customer satisfaction and commitment.

5-Managerial Implications: The results suggest banks should invest in developing MFSAs to improve customer relationships and enhance business outcomes. By understanding perceived value drivers, banks can tailor their services to meet customer needs more effectively.

Transfer from Offline Trust to Key Online Perceptions: An	Lee et al. (2007)	217		Future Research focuses on what needs attention, including the correlation between

1-Influence of Offline Trust: The findings indicate that trust in an offline bank significantly influences several key factors in the online banking environment. Specifically, it affects structural assurance, flow, consumer satisfaction,

Empirical Study			and the extent of use of the bank's online system. This suggests that customers' trust in their traditional banking experience can carry over to their online interactions with the bank. 2-Leveraging Customer Trust: In a digital age where many businesses are expanding online, the study highlights that firms can leverage the trust built in their brick-and-mortar operations to enhance customer satisfaction in their online offerings. This means that maintaining a strong offline reputation can benefit online business success. 3-Key Factor for Online Success: The research emphasizes that the extent to which offline trust affects online perceptions is crucial for the success of online banking. It suggests that banks should consider strategies reinforcing this trust to improve their online services. 4-The study fills a research gap by providing empirical evidence that trust in an offline bank can encourage the adoption of its online services. It analyzed responses from 199 South Korean consumers, demonstrating that offline trust positively influences perceptions of online banking, particularly among those new to it. 5-Future Implications: The results imply that as customers gain more experience with online banking, the importance of online banking variables, such as website satisfaction, may increase. This indicates a potential shift in how trust and satisfaction are perceived over time.	physical confidence in the bank and trust in its online banking system.
Internet banking service quality, e-customer Satisfaction, and loyalty: the modified e-SERVQUAL model.	Raza et al. (2020)	179	1-The research established a positive relationship between the independent variables (responsiveness, personal needs, reliability, user-friendliness, site organization, and efficiency) and the dependent variables (customer satisfaction and electronic customer loyalty). 2-Service quality is highlighted as a crucial factor influencing customers' perception of online banking services. This perception ultimately affects their interactions with these services. 3-The study identifies several essential factors that banks should focus on to maintain high service quality. These include efficiency, site organization, responsiveness, reliability, and user-friendliness. 4-Customers are more likely to be attracted to banks that offer faster transactions and user-friendly online portals. Banks need to enhance their website functionality and interface to meet customer expectations. 5-The findings suggest that banks should work on increasing customer awareness regarding new technologies in online banking. This is vital for achieving	First, future studies should include data collection from people throughout diverse locations of the country or the globe to get more comprehensive results. Second, researchers may analyze specific categories of online services, including sales volume and product types bought. Third, Future studies may concentrate on other factors such as technical efficiency, interface quality, perceived utility, compatibility, and their correlation with

				consumers' decisions to use Internet banking. Fourth, future Research is also necessary to examine human values in the context of the electronic banking system.
			a competitive edge in the market. 6-The study recommends that banks improve their websites and services to meet customer needs effectively. This includes providing reliable, secure services and ensuring quick and accurate transaction processing.	
Determinants and Outcomes of Internet Banking Adoption.	Xue et al. (2011)	161	1-The research identifies that customers with higher transaction demand and efficiency and those living in areas with greater online banking penetration are more likely to adopt Internet banking. This suggests that individual characteristics and local market conditions play significant roles in the adoption process. 2-Behavioral Changes Post-Adoption: After adopting Internet banking, customers tend to increase their banking activity, acquire more products, and perform more transactions. However, these changes do not lead to immediate increases in profitability for the bank. Interestingly, customers who adopt online banking are less likely to leave the bank, indicating a potential for longer-term customer loyalty. 3-Impact on Profitability: The study finds that while customer profitability generally decreases after adoption, those with high service demand and efficiency experience less reduction in profitability. Specifically, these customers show significant profit gains over time, suggesting that the adoption drivers are linked to favourable post-adoption outcomes. 4-The research highlights that the availability of physical branches does not significantly influence the likelihood of adopting online banking. However, having more branches may enhance product acquisition and transaction activity among online banking adopters, indicating that branches still hold value in the digital banking era. 5-The findings suggest that banks can enhance their online banking penetration by focusing on customer demand, efficiency, and local market conditions. Strategies such as targeted promotions and customer training could encourage more customers to adopt and utilize online banking services effectively.	Future studies conduct behavioral or survey methodologies to enhance comprehension of how network effects impact behavior.
Customer satisfaction with bank services: The role of cloud services, security, e-learning, and service	Li et al. (2021)	147	1-The impact of technology on banking: The Research highlights that the banking industry is undergoing significant transformations due to information and communication technology advancements. This shift has altered how services are delivered, making online banking a more prevalent option for customers.	First, future studies examine the correlation between enhancements in operational approaches for electronic banking

quality.			2-Factors Influencing Customer Satisfaction: The study identifies four key factors significantly influencing customer satisfaction (CS) in e-banking services. ● 2.1-Cloud Services: Cloud services are crucial for enhancing customer satisfaction. Key indicators include resource virtualization, ease of use, and cost flexibility. Banks are encouraged to leverage cloud computing to improve their services. ● 2.2-Security: The security of banking systems is another critical factor. This includes aspects such as privacy, integrity, and digital signatures. Ensuring robust security measures can lead to improved customer trust and satisfaction. ● 2.3-E-Learning: The study emphasizes the importance of e-learning for users, which includes system availability and the flexibility of use. Providing adequate e-learning resources can enhance user skills and Satisfaction. ● 2.4-Service Quality: High service quality, characterized by cost-effectiveness, user-friendliness, and technical support, is essential for customer satisfaction. Customers perceive high-quality service as valuable, which can justify higher costs. 3-Research Methodology: The study utilized a structured approach, including developing a conceptual framework and a questionnaire to gather data from bank customers. The validity and reliability of the questionnaire were confirmed, and the analysis was conducted using SMART PLS software, which helped test the research hypotheses. 4-Overall Findings: The results indicate that all proposed hypotheses were supported, confirming the significance of cloud services, security, e-learning, and service quality in enhancing customer satisfaction with e-banking services.	development and organizational culture. Second, Future Research should also include the perspectives of those who have not used Internet services, aiming to encourage their adoption and foster confidence in the electronic banking system.
Correlates of customer loyalty to their bank: A case study in Nigeria	Ehigie (2006)	139	1-Customer Satisfaction as a Key Driver: The research highlights that customer satisfaction is the most significant predictor of loyalty. This finding suggests that banks should prioritize customer satisfaction to enhance customer loyalty. 2-Service Quality Perception: Customer satisfaction is paramount, but the study confirms that perceived service quality influences customer loyalty. However, it is not as impactful as customer satisfaction. 3-Insignificance of Customer Expectations: Interestingly, the study found that customer expectations did not significantly contribute to customer loyalty. This indicates	Future researchers are urged to investigate other correlates of customer loyalty within the banking sector and develop a route model to illustrate the linkages among the variables.

that merely having expectations is not enough to foster loyalty; the fulfilment of those expectations through quality service and satisfaction matters.

4-Implications for Banking Management: The findings suggest that bank management in Nigeria should focus on understanding and meeting customer needs to improve service delivery. This approach aligns with the relational benefits approach of relationship marketing, which emphasizes the importance of fulfilling relationship-oriented customer benefits for long-term loyalty.

5-Market Surveys for Continuous Improvement: The study recommends that banks conduct regular market surveys to identify customer desires and adapt their services accordingly. This proactive approach can help banks stay competitive in a highly dynamic market.

6-Long-term Financial Performance: The research concludes that increased customer loyalty is crucial for the long-term financial success of banks. Banks can secure a loyal customer base contributing to their financial stability by ensuring high customer satisfaction and service quality.

The study by Lee et al. (2007) empirically investigated how confidence in offline bank transfers influences perceptions of the associated online banking institution. This study analyses the influence of trust in a physical bank on four components of its online banking counterpart: transactional flow, structural reliability, perceived website satisfaction, and anticipated future use. This research analyses the expected impact of offline trust based on a sample of 199 South Korean consumers regarding offline and online banking. The findings confirm that offline trust influences all four online perceptions. Those who needed to become more familiar with Internet banking felt the most significant influence. Therefore, the offline-to-online shift must be considered while developing strategies for online platforms.

Raza et al. (2020) investigated service quality dimensions in Internet banking and their impact on e-customer satisfaction and loyalty. This research utilizes a quantitative methodology, collecting data from 500 customers of banks in Pakistan using structured questionnaires and evaluating the theoretical model using partial least squares structural equation modelling (PLS-SEM). The findings demonstrate that these factors have a positive and significant impact on customer satisfaction, which subsequently has a notable positive effect on customer loyalty.

The research by Xue et al. (2011) analysed the variables affecting the adoption of Internet banking and the correlations between these variables and outcomes such as product acquisition, service activity, profitability, and loyalty. Customers showing increased transaction demand and efficiency, residing in areas with a greater concentration of online banking users, show a more accelerated adoption of online banking when controlling for immediate regional and individual variables. Moreover, customers significantly enhance their banking engagement, acquire additional products, and complete more transactions.

The study conducted by Li et al. (2021) explored the determinants of customer satisfaction with EB services. Four variables that may improve customer satisfaction in EB include cloud services, security, e-learning, and service quality. This study used structural equation modelling to evaluate the causal model with the validity and reliability of the measurement model. The research model is assessed using survey data and analyzed using SMART PLS 3.2. The results demonstrate that cloud services, security, e-learning, and service quality are four essential factors influencing customer satisfaction in Internet banking services.

The research by Ehigie (2006) examined the correlation between customer expectations, perceived service quality, and satisfaction to predict loyalty among bank customers in Nigeria. A qualitative survey study examined consumers' expectations regarding banking services. The study included 18 participants in focus group discussions and 24 in-depth interviews, all of whom were savings, current, and electronic bank account users. The quantitative research included 247 banking customers. The study indicated that perceptions of service quality and satisfaction are critical determinants of customer loyalty, with customer satisfaction making a significant impact. It analyzed the factors affecting EB usage, concentrating on electronic service quality, customer attitude, and satisfaction. Data were collected from 254 EB users and analyzed using PLS-SEM with SmartPLS 3.0. The findings demonstrate that perceived e-service quality significantly impacts customer satisfaction and EB use, suggesting that enhanced

e-service quality could improve satisfaction and thus improve EB engagement.

Figure 4 illustrates the density mapping of active articles obtained from bibliographic coupling analysis. The diverse colours of density signify several pathways recognized in the EB and customer satisfaction literature relevant to the banking sector. Several significant networks were discovered based on their colours. Studies such as those by Suh & Han (2002), Nasri & Charfeddine (2012), Casaló et al. (2008), Raza et al. (2020), and Xue et al. (2011) studied EB services about customer satisfaction, loyalty, and trust. Mainly, Raza's analysis focused on Internet banking service quality, e-customer Satisfaction, and loyalty, employing partial least square structured equation modelling (PLS-SEM) with a sample of 500 bank customers in Pakistan
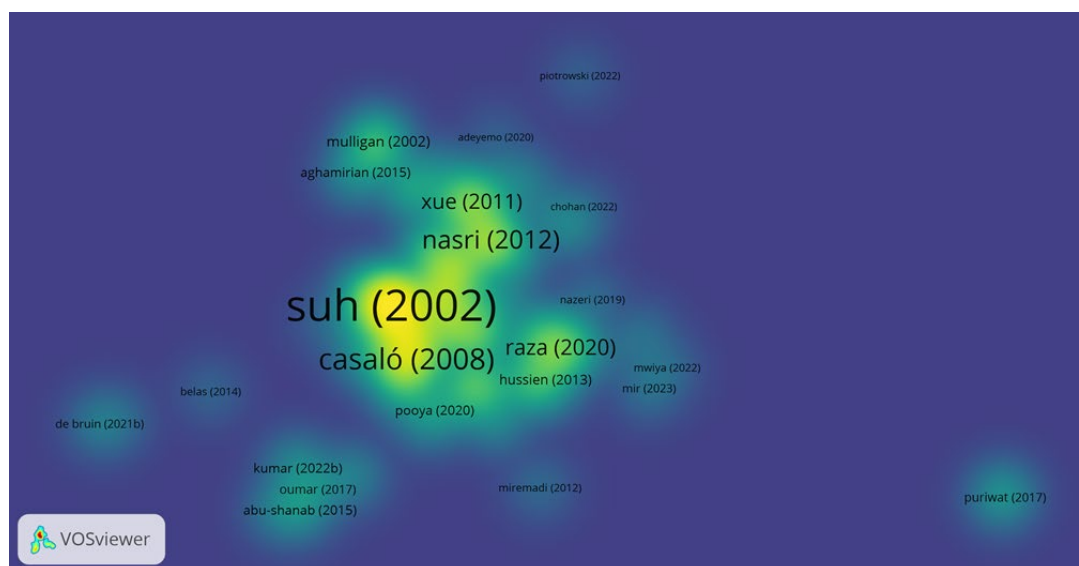

Figure 4. Density visualization of bibliographic coupling
Source: Author (Scopus database, VOSviewer)

The Raza study analyses all aspects of service quality in Internet banking and their impact on e-customer satisfaction and loyalty. This research investigates the structural link between Internet banking service quality, electronic customer satisfaction, and electronic customer loyalty based on several ideas. The findings demonstrate that all factors positively and substantially influence customer satisfaction, significantly affecting customer loyalty.

4. Practical Implication

For banks, adopting technological measures such as biometric authentication, AI-driven fraud detection, and blockchain technology can significantly enhance the security of EB. Implementing real-time transaction monitoring and automated anomaly detection can prevent cyber threats and fraudulent activities. Banks should also invest in advanced encryption protocols and regularly update cybersecurity infrastructure to protect customer data and financial transactions. For customers, increasing awareness and education on secure online banking practices, such as using strong passwords, enabling two-factor authentication, and recognizing phishing attempts, can enhance security. Financial institutions should provide user-friendly security features, such as biometric logins and encrypted communication channels, to build customer trust and satisfaction. For governments, enacting specific regulations that mandate compliance with international cybersecurity standards, such as the General Data Protection Regulation (GDPR–Regulation (EU) 2016/679) and the International Organization for Standardization, International Electro-Technical Commission (ISO)/IEC 27001, can enhance the operability of EB services. Governments should enforce strict data protection laws, require banks to conduct regular security audits, and establish legal frameworks to address digital fraud and cybercrime. Case studies of countries with robust digital banking policies, such as Singapore and Sweden, can provide empirical insights into effective regulatory practices.

5. Conclusion

The body of literature about EB and customer satisfaction within the banking sector has increased significantly during 1999 and 2024, publishing over 330 articles across several publications. Three hundred thirty articles were sourced from Scopus and then narrowed to 124 for bibliometric analysis. The main objective of this research was to analyze the intellectual evolution and knowledge structure in EB and customer satisfaction by evaluating the growth in publication quantity, identifying research trends across sources, documents, authors, affiliations, and

countries, and exploring significant topics within this intellectual field. In addition, it provides substantial insights and recommendations to guide future research in EB and customer satisfaction. This study was motivated by the acknowledgment that although significant empirical research on EB services and customer satisfaction exists, to our knowledge, bibliometric analytical review papers on EB services have yet to be published. This study's results indicate that customer satisfaction, electronic commerce, sales, internet banking, banking, customer loyalty, service quality, EB, and service quality are common topics in current literature.

Furthermore, some prospective study directions (i.e., research exploring these aspects) might improve the comprehension of the customer's acceptance of Internet banking. Studies must examine various EB systems, such as Internet banking, mobile banking, or card technology, along with the different aspects relevant to each service, etc. Furthermore, the contribution structures within the research domain indicate that the literature mainly centres on developed and developing markets, specifically India, Iran, the United States, and the United Kingdom. The leading affiliated institution is the University of Delhi, the most active author is P. Kumar, and the leading journal is the International Journal of Bank Marketing. This study provides some practical implications for banks, governments, and customers.

6. Limitations and Future Research Directions

This study presents several limitations that may impact the generalizability of its findings.

1-Scopus Database Limitation: We recognize that relying solely on Scopus may exclude relevant studies from other databases, such as Web of Science and Google Scholar. This selection, while ensuring high-quality peer-reviewed sources, may introduce selection bias. Future research should incorporate multiple databases to provide a more comprehensive perspective on EB services and customer satisfaction.

2- Exclusion of Non-English Publications: We acknowledge that limiting the study to English-language articles may overlook valuable research from non-English-speaking regions. Future studies should include multilingual sources to capture a more diverse global understanding of EB services and customer satisfaction.

3- Limited Scope of Source Types: The exclusion of books, book chapters, and review papers may have restricted the depth of our findings. Future studies should consider a broader range of academic and institutional sources to gain deeper insights into EB services and customer satisfaction.

Author Contributions

Conceptualization, R.S. & M.N.; methodology, R.S., M.N. & S.R.A.; software, R.S. & M.N.; writing—original draft preparation, R.S., M.N. & S.R.A.; writing—review and editing, R.S. All authors have read and agreed to the published version of the manuscript.

Data Availability

The data supporting our research results are included in the article.

Conflicts of Interest

The authors declare no conflict of interest.

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