

Bibliometric Analysis of Website Quality Research Trends Over 24 Years

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Abstract

Website quality has a significant impact on consumer purchasing decisions in e-commerce, attracting growing research attention. This bibliometric review examines 370 publications on website quality from 2000 to 2024 using Scopus data and VOSviewer software. The study employs performance analysis, showcasing essential research components such as publication counts, highly cited articles, authors, countries, and journal frequencies, in conjunction with science mapping to identify intellectual and thematic relationships through bibliographic coupling, co-keyword, and co-citation analyses. The results indicate that website quality has become increasingly important over time. The United States leads in both the number of publications and total citations, while African and South American countries have limited participation. Most top authors come from the United States and China, showing that these regions are producing a lot of research. This highlights the increasing importance of website quality in the world's biggest economies. Trust is a crucial aspect of website design, as evidenced by the fact that the most frequently cited articles emphasize its substantial impact on consumer decisions. This study provides a comprehensive look at website quality, focusing on less-studied topics such as website analytics and the use of digital technology for emerging markets. It also emphasizes the importance of database accessibility, pointing out that journals from major publishers like Elsevier and Taylor & Francis dominate, while those from smaller publishers like Inderscience receive fewer citations. The findings highlight significant research gaps, such as the need for further investigation of digital adoption in emerging economies and the integration of website quality dimensions with emerging technologies. This study gives a clear picture of the current research on website quality. It offers useful information for future research and practical uses, helping scholars, researchers, and policymakers improve website quality and boost e-commerce performance.

Keywords: Website Quality, Bibliometric Analysis, E-Commerce.

Introduction

E-commerce, which is defined as the digitalization of business transactions or the use of the Internet (Hendricks & Mwapwele, 2023), has lately become the most popular and innovative form of commerce worldwide (Nanda & Patnaik, 2023). The diversity of options, transparency of prices across retailers, availability of discounts, and increasing internet penetration in the world are all contributing to the rapid growth of e-commerce (Nanayakkara, Jayalath, Thibbotuwawa & Perera, 2022). The internet has emerged as a significant purchasing channel that offers consumers a variety of advantages, such as reduced product costs, increased access to information, convenience, the avoidance of intermediaries, and a wider selection of goods and services (Bartol, Vehovar, Bosnjak & Petrovčič, 2023; Enjavi Hosseini, Bakhshandeh & Darvishi, 2024). In reality, the Internet has emerged as a critical strategic asset in the current competitive business environment, as organizations are beginning to recognize the potential implications of the Internet in their operations. Consequently, there is a growing apprehension regarding the quality of Web applications and the methods by which they are developed (Carlos & Rodrigues, 2012).

Shopping websites are responsible for a substantial portion of the revenues of e-commerce businesses and serve a vast number of consumers (Tseng, Huang, Cheng & Teng, 2023). For the past three decades, websites have emerged as one of the most critical platforms on the Internet for the dissemination of information and the provision of services to society (Morales-Vargas, Pedraza-Jimenez & Codina, 2023). Therefore, websites are advantageous instruments for conducting electronic commerce operations (Sharma & Lijuan, 2015). The swiftly expanding innovative features of online shopping websites are of significant importance to consumers, retailers, and businesses. To attract and maintain customers in the e-commerce sector, businesses must design high-quality websites that provide an excellent online experience. Consequently, research indicates that organizations must assess the quality of their websites (Hasanov & Khalid, 2015).

The necessity of assessing the quality of websites became apparent shortly after their initial appearance (Morales-Vargas et al., 2023). DeLone and McLean's (2003) research identified quality as an indicator of success (Sharma & Lijuan, 2015). Before consumers are inclined to make a purchase, they must perceive an e-commerce website as having a sufficiently high level of perceived quality. Similarly, the quality of a website is a critical element in mitigating consumer risk concerns. Consumers, particularly those who are time-constrained or indolent, frequently employ their initial emotional impression of quality as a "safe to shop" heuristic (Longstreet, Brooks, Featherman & Loiacono, 2022). The publication of numerous studies and the presence of valuable insights on website quality (WQ) suggest that this topic has achieved a level of development that warrants further investigation. This study aims to enhance the existing understanding of WQ by conducting a comprehensive evaluation of previous studies on the topic. While qualitative literature evaluations enhance our comprehension of the research process, they are subject to certain inherent constraints. Structured quantitative methods can effectively address these limitations and offer a thorough and unbiased understanding of the study environment. Bibliometric analysis is one of the quantitative methodologies used to review literature (Ilchi, Vanaki & Seivandian, 2021).

Pritchard (1969) first used the concept of bibliometrics to describe the use of mathematical and statistical techniques in the analysis of articles and other forms of communication (Lim, Rasul, Kumar & Ala, 2022). The bibliometric method enables the representation of research

data through the use of maps and graphs, a task that is challenging to accomplish using conventional methods (Binh Nguyen, Pham & To Truong, 2023). By employing quantitative tools and procedures, researchers can examine extensive collections of scientific papers (Maucuer, Renaud, Ronteau & Muzellec, 2022). A bibliometric analysis involves a statistical examination of publications to assess the scientific activities within specific fields. This process gathers information about researchers, scientific journals, and the sources of publications. (Leitão, Pereira, Gonçalves & Oliveira, 2023).

In recent years, WQ has become a prominent and profitable research area as a result of its increasing significance and widespread academic interest. Two bibliometric studies that focused on WQ were identified through a database search: Morales-Vargas, Pedraza-Jimenez and Codina (2020), which studied WQ evaluation, and Ćurlin, Jaković and Bach (2022), which focused on hotel WQ. Although these reviews offer valuable insights into specific aspects of WQ, their scope and depth are still restricted.

Existing research frequently concentrates on specific aspects of WQ, such as sector-specific applications or evaluation methodologies, without providing a comprehensive understanding of the broader research landscape. Furthermore, numerous reviews are predicated on outdated literature, which results in a lack of coverage of the most recent advancements and trends in WQ research. Additionally, the intellectual structure and evolution of the field are not fully investigated by these studies, which typically employ basic bibliometric methods.

The current study adopts a more comprehensive approach by analyzing a broader range of literature, including publications up to April 2024, which significantly extends beyond the timelines of previous reviews, which focused on studies up to 2020 and 2022. This approach is based on these prior efforts. Advanced bibliometric techniques, including bibliographic coupling, co-citation analysis, and keyword co-occurrence analysis, are implemented to acquire a more profound understanding of the intellectual underpinnings and developmental trajectory of WQ research. This study offers a comprehensive and current perspective on WQ by addressing these gaps. Therefore, the research questions (RQ) of this study are presented as follows:

RQ1. What are the bibliometric trends (performance) of WQ research?

RQ2. What is the intellectual structure of WQ research?

Literature Review

A website serves as the main medium of communication between consumers and vendors, and so it has a crucial function in online commerce (Leong, Hew, Ooi & Dwivedi, 2020). Gefen, Karahanna and Straub (2003) argued that a website serves not just as an information system but also as a means of interacting with a seller (Giao, Nhat Vuong & Quan, 2020). WQ, from an e-commerce standpoint, is considered a crucial internal factor for customers to evaluate the standards of e-retailers (Saleem, Bilal, Topor & Capusneanu, 2022). WQ is defined as the level of user-friendliness in navigating and interacting with a website (Yadav & Mahara, 2017). Aladwani and Palvia (2002) primarily determine a website's quality by its ability to meet user needs and showcase its overall excellence. On the other hand, Gregg and Walczak (2010) define WQ as the attributes that make it useful to consumers (Morales-Vargas et al., 2023).

The initial determinant of WQ is official page rankings. If a rating is low, the owners should prioritize their efforts to thoroughly assess the quality of their website and, upon examination,

make necessary improvements to the deficient aspects (Sharma & Lijuan, 2015). When online buyers are looking for products and deciding which one to buy, they assess the quality of websites by searching and comparing product information (Tseng et al., 2023). According to Hasanov and Khalid (2015), clients form their perception of WQ based on the presence of elements that fulfill their needs and impress them with the overall excellence of the website. We can classify WQ into various categories such as security, enjoyment, information quality, ease of use, and service quality. Online shopping websites that offer superior functionality, accessibility, reliability, usability, flexibility, and stability to online consumers can be considered high-quality websites (Aggarwal & Aakash, 2018).

The Information Systems success model, which was developed by DeLone and McLean (2003), explicitly evaluates the features of WQ in the context of e-commerce. Saleem et al. (2022), identify three well-recognized dimensions: information quality, system quality, and service quality. System quality was defined as the ideal attributes of an e-commerce system, encompassing the website's availability, navigability, and download speed. A website's system quality encompasses not only its functionality but also its style and appearance (Wattana & Tantong, 2019). WQ is determined by its navigational scheme and hierarchy, as well as its design, which includes elements such as visual appeal, innovativeness, aesthetics, and the use of colors and shapes (Omoruyi, 2018). According to Huang, Chen, Liao, Cheng & Teng (2022), service quality comprises five subdimensions: tangibility, responsiveness, empathy, assurance, and service reliability. The term "information quality" refers to the value that a consumer perceives in the output generated by a website (Ihsan, Li & Alexis, 2020). A seller's website is essential for the provision of information regarding products, services, and events. Relevance, sufficiency, accuracy, and timeliness are all critical components of information quality (Chen, Huang & Davison, 2017). DeLone and McLean (2003) proposed that system quality encompasses all of the support provided to the consumer during the purchase and post-purchase process (Wattana & Tantong, 2019). Service quality is the comprehensive assessment of the service provided by the seller's website by the buyer. The quality of service provided not only meets the expectations of consumers but also enhances their favorable perceptions of the seller (Chen et al., 2017).

Many studies have examined WQ, considering information quality, system quality, and service quality characteristics. Nevertheless, a scrutiny of other research works indicates that the existing body of literature has put forth supplementary aspects. As an illustration, Sun, Zhao and Wang (2022) included interactive quality as an additional parameter. Garcia-Madariaga, Recuero Virto, Blasco López and Aldas Manzano (2019) identified several factors of WQ, including content, ease of understanding, emotion, informational fit-to-task, promotion, and visual appeal. In addition, Ali et al. (2016) and Amin, Ryu, Cobanoglu and Nizam (2021) identified usability, functionality, security, and privacy as key elements of WQ. Paek, Morse, Kim and Jung (2021) incorporated convenience, content, aesthetics, interactivity, and customization as significant factors.

This study will investigate WQ from a comprehensive perspective, rather than restricting the analysis to specific, predetermined dimensions, in light of the diverse approaches to conceptualizing WQ in prior research.

Materials and Methods

Systematic literature reviews serve as both a methodology and a result of academic research

(Paul, Lim, O’Cass, Hao & Bresciani, 2021). Researchers currently encounter significant obstacles that encompass not only the formulation of novel hypotheses and their empirical verification, but also the meaningful integration of vast amounts of scientific material using objective analytical techniques, devoid of the researcher's personal bias. Bibliometrics has become a highly regarded and objective method for analyzing a substantial amount of literature in this particular context (Donthu, Kumar, Pattnaik & Lim, 2021). Bibliometric analysis is a widely employed technique for mapping the intellectual structure of a study field (Gupta, Pandey & Sebastian, 2021). In addition, the bibliometric method enables the representation of research data through the use of maps and graphs, a task that is challenging to accomplish using conventional methods (Binh Nguyen et al., 2023). It is a widely used approach for examining and analyzing extensive scientific data, facilitating a thorough literature review within a specific area. This method helps identify knowledge gaps, inspires new research ideas, and clarifies the intended contributions of researchers in that field (Janik, Ryszko & Szafranec, 2021). In order to carry out the review analysis, we will utilize a review methodology known as the Scientific Procedures and Rationales for Systematic Literature Reviews (SPAR-4-SLR) technique. A procedure is crucial for systematic literature reviews as it ensures careful planning, consistent implementation, and clear replication. Essentially, a protocol allows researchers to predict issues, minimize subjectivity, ensure responsibility, and maintain the integrity of their research (Paul et al., 2021).

Bibliometric analysis

Bibliometrics offers an alternative to the conventional qualitative and interpretive methods used in literature evaluations (Maucuer et al., 2022). The bibliometric method refers to the utilization of quantitative tools to analyze bibliographic data (Donthu, Kumar, Pandey, Pandey & Mishra, 2021). Bibliometric analysis investigates the intellectual and bibliometric structure of a field by examining the social and structural connections among a variety of research elements, such as authors, countries, institutions, and topics (Donthu, Kumar, Mukherjee, Pandey & Lim, 2021). According to Donthu, Kumar, Mukherjee, Pandey & Lim (2021) and Lim, Rasul, Kumar and Ala (2022), there are two main sorts of bibliometric analysis methods: performance analysis and science mapping.

Performance analysis is a method that evaluates the performance of articles, authors, countries, and journals by examining their citation and publication counts. The approach focuses on the intellectual interactions and structural connections among the various components of research (Donthu, Kumar, Mukherjee, Pandey & Lim, 2021). Researchers have a wide range of bibliometric methodologies at their disposal for scientific mapping, which they can use based on their research goals and the nature of the data they are working with (Lim et al., 2022). Co-citation analysis and keyword co-occurrence analysis are two often employed methods in science mapping (Donthu, Kumar, Mukherjee, Pandey & Lim, 2021; Lim et al., 2022). Furthermore, this research will employ bibliographic coupling analysis.

Co-citation analysis is a frequently employed bibliographic technique for the field of management sciences. The purpose of its design was to examine the reasoning behind the development and validation of a field of study, area of research, or concept. The primary objective of the method is to examine the citation patterns within a collection of scientific journals. Specifically, it investigates the scenario where a third document references two other documents simultaneously, thereby establishing a co-citation relationship (Maucuer et al.,

2022). In order to avoid the overwhelming task of analyzing a large number of references, it is crucial to identify the intellectual core of the topic. This refers to the subset of references that are most frequently utilized and considered significant in the literature. In order to determine the intellectual core, the initial stage involves calculating the frequency of citations for each reference (Renaud, Walsh & Kalika 2016).

Keyword co-occurrence analysis operates under the assumption that the presence of two keywords in several documents suggests a conceptual relationship between them. Authors frequently see the keywords they include in their documents as significant and thus use them to convey the essential ideas of their studies. Examining the keywords and their co-occurrence can be crucial in comprehending a particular area of research (Donthu Pandey, Pandey & Mishra, 2021). In a co-word analysis, the terms are often obtained from "author keywords." If these are unavailable, the analysis can retrieve significant words from "article titles," "abstracts," and "full texts" (Donthu, Kumar, Mukherjee, Pandey & Lim, 2021; Donthu, Kumar, Pattnaik & Lim, 2021).

The term "bibliographic coupling" was initially proposed by Kessler in 1963, demonstrating that scholarly works exhibit intellectual convergence via common referencing patterns (Donthu, Kumar, Pattnaik & Lim, 2021). When two primary documents share at least one cited reference, this is called bibliographic coupling analysis and it looks at how much the reference lists of those documents overlap (Jiang, Jiang & Chen 2024). The literature should be relatively homogeneous in order to facilitate the identification of the research front in bibliographic coupling analysis. The analysis is simplified when the sample is more consistent, as it contains a greater number of common references (Maucuer et al., 2022).

The SPAR-4-SLR protocol

Paul et al. (2021) developed the SPAR-4-SLR procedure, which is followed in the systematic literature review of WQ. This approach directs the collection, arrangement, and assessment of the literature (Figure 1).

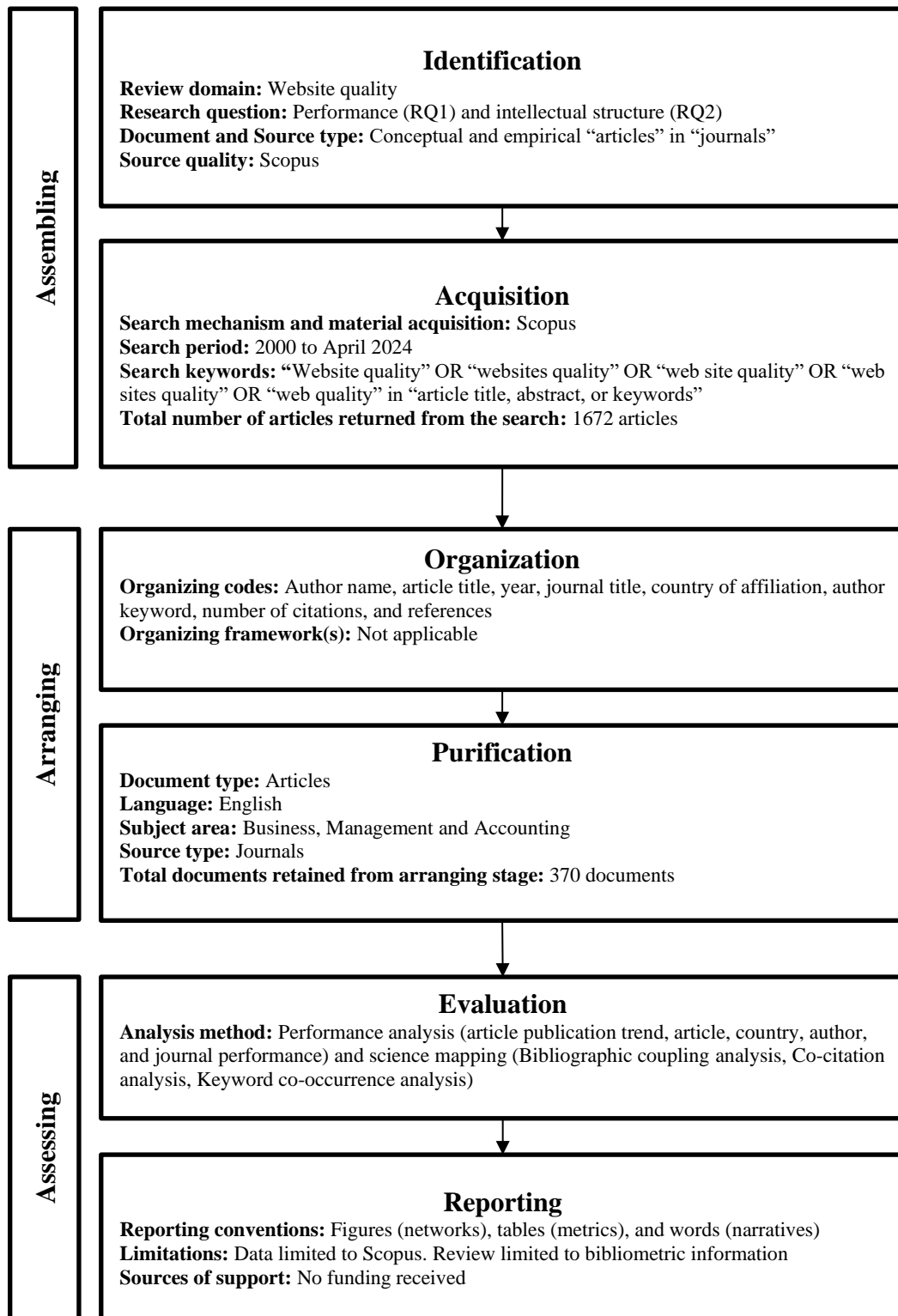


Figure 1: The SPAR-4-SLR protocol

Assembling

The SPAR-4-SLR protocol's initial phase is the assembly phase, which involves the identification and acquisition of pertinent literature. This process involves defining the research domain and specific research questions, determining pertinent sources and keywords, and

establishing criteria for inclusion, such as language and search period (Wolf, 2023).

The identification focus of this review is on WQ, which serves as its primary emphasis. Meanwhile, the research questions explore the core elements that define the bibliometric performance and intellectual structure of WQ research, as outlined in RQ1 and RQ2. As the primary sources of rigorously peer-reviewed academic literature, only conceptual and empirical "articles" in "journals" qualify as the source type (Lim et al., 2022). The Scopus database was employed for data extraction, as its indexed periodicals are more comprehensive than those in other databases, such as WOS (Lim et al., 2022). Additionally, this database boasts the most comprehensive coverage of peer-reviewed quantitative analysis literature (Donthu, Kumar, Pattnaik & Pandey, 2021), with 60% more coverage than WOS (Donthu, Pandey, Pandey & Mishra, 2021).

The data was extracted in April 2024, and the search was conducted from 2000 to 2024, as the majority of articles on WQ were first published in journals from 2000 onward. Consequently, this investigation spans a 24-year period. In Scopus, utilize the "article title, abstract, or keywords" fields to identify articles through a comprehensive keyword search, which may include "website quality," OR "websites quality," OR "web site quality," OR "web sites quality," OR "web quality." Initially, 1672 documents were identified during the search.

Arranging

In the second step of the SPAR-4-SLR process, known as "arranging," the articles that were found during the search are arranged and refined (Wolf, 2023).

Author name, article title, publication year, journal title, country of affiliation, author keywords, citation count, and references were among the criteria used to categorize the bibliometric data from the publications for organization.

The subsequent criteria were implemented during the data purification process in this investigation:

1. The documents must be articles.
2. The articles must be composed in the English language.
3. The articles must pertain to the fields of accounting, management, or business.
4. The articles must be published in journals.

The initial set consisted of 374 articles following the application of these filters. The quality, similarity, and non-repetition of these 374 articles were subsequently assessed. A final sample of 370 unique, high-quality articles was obtained as a consequence of the removal of four articles during this review.

Assessing

Assessing, concentrating on analyzing, and reporting the reviewed articles is the last phase of the SPAR-4-SLR protocol (Lim et al., 2022). Evaluation strategies utilized in this study included performance analysis and science mapping.

The performance analysis will begin by examining the number of papers published each year. Next, the analysis will include the performance of the articles, countries, authors, and journals.

The scientific mapping phase will involve the implementation of bibliographic coupling, keyword co-occurrence, and co-citation analysis.

The Scopus database will be used to retrieve publication data. Excel will be used to organize and analysis the data. OpenRefine will be used for data cleaning and preprocessing. The

VOSviewer software will be used to generate scientific mapping visualizations, including bibliographic coupling, keyword co-occurrence, and co-citation networks. Reporting conventions include the use of figures, tables, and words to report. Furthermore, this research confines its scope to the Scopus database and restricts its analysis to bibliometric data only. Additionally, this research lacks any form of backing from an organization or financial entity.

Results

The research results can be broken down into two groups: performance analysis and scientific mapping. The performance analysis section illustrates the upward trend of published articles pertaining to the subject of WQ. In addition, we undertake investigations on the performance of articles, countries, authors, and journals. The scientific mapping section provides evaluations of bibliographic coupling, keyword co-occurrence, and co-citation. This part distinguishes itself from prior bibliometric research in the field of WQ by specifically examining networks that involve journals, keywords, and references.

Performance analysis

The performance analysis section presents a graphical representation of the number of publications per year, seen in Figure 2.

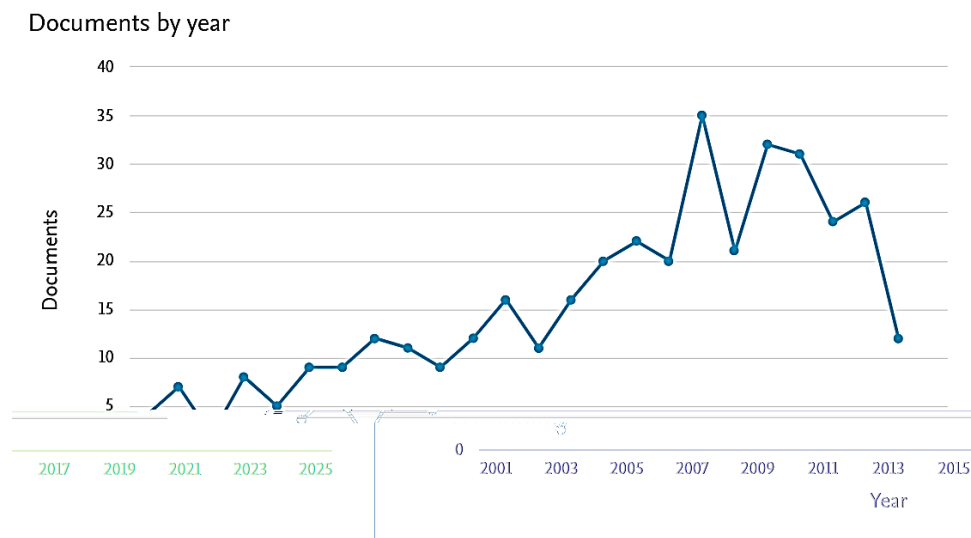


Figure 2: Number of WQ articles published between 2000 and 2024

Figure 2 depicts the progression of research on WQ studies from its establishment in 2000. The decrease in the number of articles in 2024 compared to prior years is probably because the data gathering ended in April 2024. Supplementary articles are expected to be released in the later months of 2024, and certain journal issues from 2023 may not have been fully considered. Therefore, it is expected that the real quantity of high-quality articles on websites quality in the past one to two years would exceed the number shown in Fig. 2, demonstrating an overall increase in this field of research. In the next part, we will offer a detailed study of the performance of articles, countries, authors, and journals.

Article performance

Table 1 contains the articles that have been cited the most frequently in relation to WQ. The paper most frequently cited is Mcknight, Choudhury and Kacmar (2002a), which has received an average of 164.13 citations per year since its publication, totaling 3611 citations. The primary objective of this investigation is to "Developing and validating trust measures for e-commerce: An integrative typology." The subsequent two most frequently cited articles are Mcknight, Choudhury and Kacmar (2002b) and Mckinney, Yoon and Zahedi, (2002), with 1425 and 1390 citations, respectively. The preliminary study examines "The impact of initial consumer trust on intentions to transact with a web site: A trust building model," while the subsequent study examines "The measurement of Web-customer satisfaction: An expectation and disconfirmation approach."

Table 1
Most cited articles on WQ

Rank	Authors	Year	Title	Citations	C/Y
1	Mcknight D.H.; Choudhury V.; Kacmar C.	2002a	Developing and validating trust measures for e-commerce: An integrative typology	3611	164.13
2	Mcknight D.H.; Choudhury V.; Kacmar C.	2002b	The impact of initial consumer trust on intentions to transact with a web site: A trust building model	1425	64.77
3	Mckinney V.; Yoon K.; Zahedi F.	2002	The measurement of Web-customer satisfaction: An expectation and disconfirmation approach	1390	63.18
4	Teo T.S.H.; Srivastava S.C.; Jiang L.	2008	Trust and electronic government success: An empirical study	961	60.06
5	Liang T.-P.; Ho Y.-T.; Li Y.-W.; Turban E.	2011	What drives social commerce: The role of social support and relationship quality	929	71.46
6	Aladwani A.M.; Palvia P.C.	2002	Developing and validating an instrument for measuring user-perceived web quality	839	38.13
7	Ahn T.; Ryu S.; Han I.	2007	The impact of Web quality and playfulness on user acceptance of online retailing	708	41.64
8	Parboteeah D.V.; Valacich J.S.; Wells J.D.	2009	The influence of website characteristics on a consumer's urge to buy impulsively	593	39.53
9	Wells J.D.; Valacich J.S.; Hess T.J.	2011	What signal are you sending? How website quality influences perceptions of product quality and purchase intentions	593	45.61
10	Filieri R.; Alguezaui S.; Mcleay F.	2015	Why do travelers trust TripAdvisor? Antecedents of trust towards consumer-generated media and its influence on recommendation adoption and word of	543	60.33

Rank	Authors	Year	Title	Citations	C/Y
			mouth		
11	Bai B.; Law R.; Wen I.	2008	The impact of website quality on customer satisfaction and purchase intentions: Evidence from Chinese online visitors	472	29.50
12	Kim J.; Lennon S.J.	2013	Effects of reputation and website quality on online consumers' emotion, perceived risk and purchase intention: Based on the stimulus-organism-response model	386	35.09
13	Everard A.; Galletta D.F.	2005	How presentation flaws affect perceived site quality, trust, and intention to purchase from an online store	349	118.37
14	Lee Y.; Kozar K.A.	2006	Investigating the effect of website quality on e-business success: An analytic hierarchy process (AHP) approach	346	19.22
15	Cao M.; Zhang Q.; Seydel J.	2005	B2C e-commerce web site quality: An empirical examination	336	17.68

Country performance

Table 2 provides a list of the top 15 countries in the field of WQ research, as determined by the total number of articles and citations. The top four countries in terms of article number are USA, India, China, and Indonesia. The top four countries in terms of cumulative citations are USA, Taiwan, UK, and Hong Kong. It is evident that USA is the leader in both metrics, and several Southeast Asian countries also have a substantial presence in the rankings.

The reduced representation of European countries in these rankings was somewhat unanticipated. Additionally, the absence of countries from Africa and South America is disappointing. This suggests that, despite the fact that some of these regions have published on WQ, their aggregate contribution and impacts are still limited in comparison to the leading nations.

The scope of WQ research is not limited to technical subjects, which are typically the domain of developed nations. Factors such as consumer trust in websites can be significantly influenced by the cultural context of a society. As a result, it is imperative that African and South American countries increase their commitment to and investment in WQ studies, as these regions may offer valuable insights into the cultural and societal factors that influence online user experiences and perceptions.

*Table 2
Most prolific countries based on total WQ articles and citations*

Ranking by total articles			Ranking by total citations		
Rank	Country	Articles	Rank	Country	Citations
1	USA	101	1	USA	18332
2	India	44	2	Taiwan	2357
3	China	30	3	UK	1806

Ranking by total articles			Ranking by total citations		
Rank	Country	Articles	Rank	Country	Citations
4	Indonesia	30	4	Hong Kong	1635
5	Spain	29	5	China	1510
6	Taiwan	27	6	South Korea	1330
7	Hong Kong	18	7	France	1075
8	Malaysia	17	8	Singapore	967
9	UK	15	9	Kuwait	918
10	South Korea	14	10	Spain	750
11	Italy	13	11	Malaysia	639
12	Australia	12	12	India	599
13	Iran	11	13	Canada	567
14	Pakistan	9	14	Australia	460
15	Lithuania	8	15	Netherlands	335

Author performance

Table 3 presents the top 15 authors in WQ, ranked based on the number of published articles. It also includes their total citation counts in Scopus. Professor Law is the most prolific author, having written eight publications that have received a combined total of 1004 citations. Around half of these citations come from one of Law's articles that looks at how WQ affects customer satisfaction and purchase intentions. In addition, Law has authored two more publications that have received significant attention, each with over 100 citations. These articles specifically focus on the influence of WQ on online booking intentions. Professors Akram from Peking University in China and Kim, affiliated with the University of Georgia in USA, are distinguished authors who have each authored six articles. Akram's publications have accumulated 296 citations, whereas Kim's has obtained 740 citations. Kim's two most extensively cited works, which have garnered far more citations than his other publications, investigate the dimensions of WQ in retail stores. Akram has also authored an article on the impact of WQ on online impulse buying, which has garnered a higher number of citations compared to his other publications.

Table 3
Top 15 authors by number of articles

Rank	Author	Affiliation	Number of articles in Scopus	Number of citations in Scopus
1	Law, R.	University of Macau (China)	8	1004
2	Kim, S.	University of Georgia (USA)	6	740
3	Akram, U.	Peking University (China)	6	296
4	Jeong, M.	University of Massachusetts (USA)	5	591
5	Tanveer, Y.	Government College University, (Pakistan)	4	204
6	Dominic, P.D.D.	Universiti Teknologi Petronas (Malaysia)	4	70
7	Bernal-Jurado, E.	University of Ja'en (Spain)	4	55
8	Mozas-Moral, A.	University of Ja'en (Spain)	4	55

Rank	Author	Affiliation	Number of articles in Scopus	Number of citations in Scopus
9	Chawla, D.	International Management Institute (India)	4	32
10	Pandey, S.	International Management Institute (India)	4	32
11	Jasinskas, E.	Lithuanian Sports University, Vilnius University (Lithuania)	4	2
12	Stoel, L.	The Ohio State University (USA)	3	611
13	Barnes, S. J.	University of East Anglia (UK)	3	483
14	Carlson, J.	University of Newcastle (Australia)	3	183
15	Gregg, D.G.	University of Colorado (USA)	3	168

Journal performance

Table 4 shows the total number of citations the articles have received in this field, as well as a list of the top 15 journals that have published WQ articles and have a Scopus profile. Journals with ten or more articles on WQ include I&M, JRCS, and IJBIS.

Although IJBIS has the highest number of published articles in this domain, with 13, it has only received 150 total citations. This is an intriguing fact. In contrast, I&M journal has received the most citations, totaling 2685, despite having only published ten articles. The publisher is one potential explanation for the relatively reduced citation count of articles in IJBIS. In contrast to the JRCS and I&M, which are published in the Elsevier, IJBIS is published in the Inderscience. Furthermore, the IJBIS is not entirely open-access, with only a portion of its issues being available for free. Consequently, it is reasonable to expect that its articles will receive a significant number of citations.

*Table 4
Top 15 journals by number of articles*

Rank	Journal	Publisher	Ranking by number of articles	Number of citations in Scopus
1	International Journal of Business Information Systems (IJBIS)	Inderscience	13	150
2	Journal of Retailing and Consumer Services (JRCS)	Elsevier	11	939
3	Information and Management (I&M)	Elsevier	10	2685
4	International Journal of Hospitality Management (IJHM)	Elsevier	8	1449
5	International Journal of Electronic Commerce (IJEC)	Taylor & Francis	7	1758
6	Total Quality Management and Business Excellence (TQMBE)	Taylor & Francis	7	659
7	Journal of Electronic Commerce in Organizations (JECO)	IGI Global	6	48
8	Journal of Quality Assurance in Hospitality and Tourism (JQAH)	Taylor & Francis	6	105
9	International Journal of Electronic Marketing and Retailing (IJEMR)	Inderscience	5	25
10	International Journal of Information	Elsevier	5	612

Rank	Journal	Publisher	Ranking by number of articles	Number of citations in Scopus
	Management (IJIM)			
11	Journal of Business Research (JBR)	Elsevier	5	283
12	Decision Support Systems (DSS)	Elsevier	4	786
13	Industrial Management and Data Systems (IMDS)	Emerald	4	485
14	Journal of Travel and Tourism Marketing (JTTM)	Taylor & Francis	4	306
15	Journal of Hospitality and Tourism Technology (JHTT)	Emerald	4	218

Science mapping

Bibliographic coupling analysis

The Journal research cluster network with the greatest number of articles published in the field of WQ with a threshold of 4 is the subject of investigation. The results indicate that 23 journals are located in three clusters. The red cluster, which is the largest cluster, is the information cluster, which consists of journals such as Inf. Manag., Int. J. Bus. Inf. Syst., and Int. J. Inf. Manag. The green cluster, which contains eight journals, is the tourism cluster, which consists of journals such as Int. J. Hosp. Manag., J. Hosp. Tour. Technol., J. Hosp. Mark. Manag., J. Qual. Assur. Hosp. Tour., and J. Travel Tour. Mark. Lastly, the blue cluster, which contains six journals, is e-commerce and retailing, which consists of journals such as Int. J. Electron. Mark. Retail., Int. J. Retail Distrib. Manag., J. Electron. Commer. Organ., and J. Internet Commer.

The node size in Figure 3 represents the number of citations that WQ articles earned in each publication; higher citation counts are indicated by larger nodes. The connections between nodes indicate common citations, while the proximity of nodes indicates the degree of similarity in WQ articles referenced across journals. Within a specific area of WQ research, journals with nodes positioned closer to one another have more related WQ articles they reference.

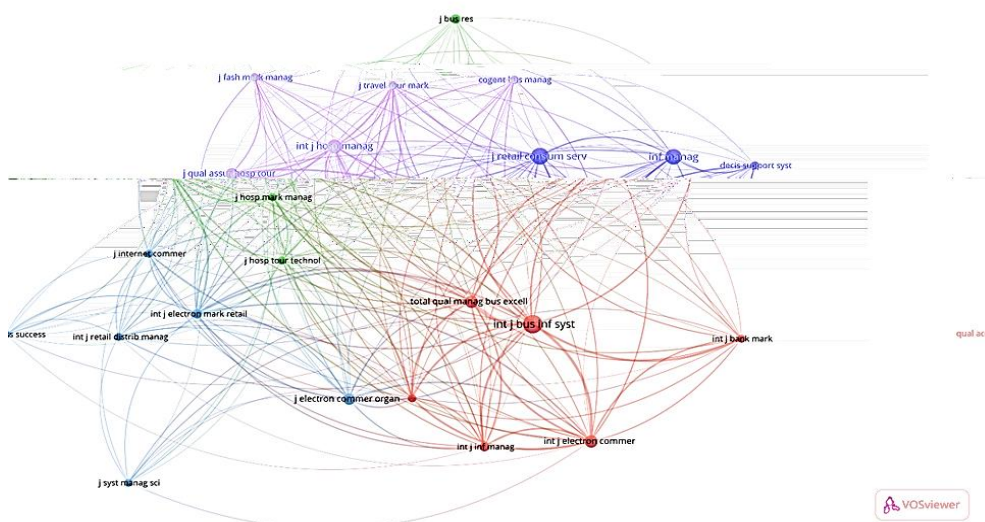


Figure 3: Bibliographic coupling network of sources (journals)

Co-citation analysis

A co-citation analysis was performed on the references to find the most influential ones related to WQ (Figure 5). The analysis included 35 references, as the minimal number of citations was established at 17. The co-citation analysis, as illustrated in Figure 5, identified three distinct clusters of references. There are 14 references in the red cluster, with Bai et al. (2008) being the most highly cited, with 38 citations. WQ evaluation and measurement, as well as WQ and consumer satisfaction, are substantive topics of red cluster. The green cluster comprises 12 references, with Delone and McLean (2003) having the most citations at 34. The major topics of this cluster are information systems success and technology acceptance models. The blue cluster comprises 9 references, with Fornell & Larcker (1981) receiving the most citations, accounting for 65. This cluster addresses the use of structural equation modeling (SEM), as well as trust.

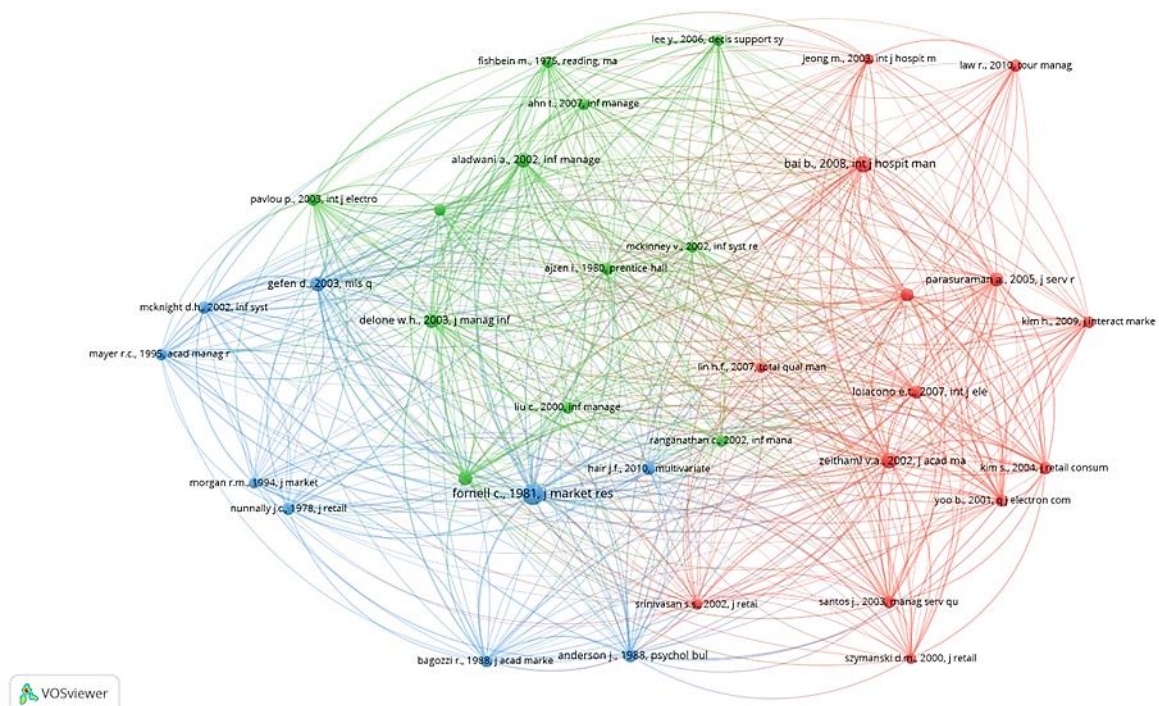


Figure 5: Reference co-citation network

A secondary document that is referenced to primary documents is represented by a node. A higher number of co-citation with other secondary documents is indicated by larger nodes. The proximity of two nodes inside the same cluster indicates that two related secondary papers were co-cited in a single primary document.

Discussion

The aim of present study was to provide a comprehensive bibliometric analysis of WQ articles from 2000 to 2024, with a focus on identifying research trends and the field's intellectual framework. The increasing number of publications underscores the growing recognition of WQ as a critical factor influencing consumer behavior in e-commerce. The analysis, conducted on 370 eligible articles from the Scopus database, involved two main parts: performance analysis and science mapping.

Morales-Vargas et al. (2020) and Ćurlin et al. (2022) conducted two noteworthy bibliometric studies on WQ that offer valuable insights. The former concentrated on the evaluation of WQ, whereas the latter investigated the quality of hotel websites. In contrast to the current research, which investigates the more extensive landscape of WQ studies, both studies had more restricted scopes. Previous research has examined publications to 2018 and 2022 in terms of time coverage. The current study broadens this scope by incorporating research conducted through 2024. Furthermore, this research implements VOSviewer, a tool that is extensively implemented in bibliometric investigations, in contrast to previous analyses that implemented NVivo and MAXQDA. This research is distinguished by its comprehensive scope, advanced bibliometric techniques, and extended timeline, despite the fact that performance analysis and scientific mapping were components of both previous studies. The subsequent sections will provide a more detailed explanation of these distinctions.

In the performance analysis section, it was found that the most cited articles among the 4 articles that had the most citations were 3 about trust, and this shows the role and importance of trust in the field of WQ. While the main focus of three highly cited studies by Morales-Vargas et al. (2020) was website design and architecture, Ćurlin et al. (2022), in two well-cited studies, emphasized WQ as a tool for online shopping and hotel booking. In addition, USA was the country that was at the top of the countries that had published research in this field, both in terms of the total number of articles published and in terms of the total number of citations to these articles. In addition, the weak role of South American and African countries among active countries in this field of research was evident. While Morales-Vargas et al. (2020) identified USA as the most productive country in terms of published articles, Ćurlin et al. (2022) ranked USA second, following China. Spain is also a common country among the top five in all three studies; however, in Morales-Vargas et al. (2020), it holds the second position, close to USA, as the study also considered Spanish-language publications. In terms of authors, American and Chinese authors had a better situation, so that 4 authors with the highest number of articles published in this field were related to these two countries. This is despite the fact that the most prolific authors in Morales-Vargas et al.'s (2020) research are from Spain, Turkey, and Jordan, with none of the 11 prolific authors on their list being from USA or China. In terms of journals with the highest number of articles and citations, it was also found that most of these journals are related to Elsevier and Taylor & Francis publishers. Although "International Journal of Business Information Systems" had the highest number of articles published on WQ, it garnered only 150 citations. This relatively low citation count may be partly due to the limited accessibility of its articles, as most are not open access. Additionally, the visibility of the journal's publisher, Inderscience, is lower compared to more prominent publisher like Elsevier, which may further contribute to the low citation frequency. In Morales-Vargas et al.'s (2020) research, although the most frequently cited journal was a Spanish publication-not as prominent as those from publishers like Elsevier or Emerald-the journals ranked second through fourth were from the Emerald publisher.

In scientific mapping, bibliographic coupling analysis was done first and three clusters of information, tourism, and e-commerce and retailing for journals emerged. It highlights the multidisciplinary applications of WQ research, demonstrating its critical role across various industries and its ability to address sector-specific challenges and opportunities.

Then the co-occurrence analysis of keywords was done and it was found that the keywords were placed in seven clusters including online consumer behavior, WQ in e-commerce, digital

technology adoption and evaluation, online shopping behavior in emerging market, website analytics and modeling, consumer behavior theory, and WQ dimensions. These clusters demonstrate the extensive scope of research in the field, encompassing theoretical foundations, technological advancements, and practical applications. They underscore the importance of addressing diverse market dynamics and tailoring strategies to the unique requirements of specific industries and regions. While, Ćurlin et al. (2022) limited their analysis to keyword co-occurrence and concluded that there are five distinct clusters: booking intention, innovation, methodology, psychology, and special events. The larger scope of e-commerce research-which spans a wide range of technological, behavioral, and market dynamics-resulting in more complicated and varied clusters-defines the differences in the number of clusters identified. While part of e-commerce, tourism WQ has a more limited emphasis on particular elements like booking intention and technological innovations meant to improve the booking process in hospitality, so producing less clusters. Furthermore, contributing to the variation in clustering results is e-commerce research, which is more developed and spans a larger scholarly basis than tourism studies on WQ. Emphasizing the need of sector-specific approaches, these variations show how the scope and focus of research within a larger domain, such e-commerce, shape bibliometric analysis results.

Finally, a co-citation analysis we faced three clusters encompassing WQ evaluation and measurement, as well as WQ and consumer satisfaction, information systems success, as well as technology acceptance models, and the use of structural equation modeling (SEM), as well as trust. This analysis underscores the interaction between practical applications, cutting-edge methodologies, and robust theoretical frameworks, with trust and consumer satisfaction serving as the unifying themes.

In contrast to Morales-Vargas et al. (2020), which identified significant co-authorship networks, this study did not uncover any co-authorship relationships. This discrepancy is likely the result of variations in the scope of the datasets. They conducted an analysis of numerous databases, such as Scopus and WoS, and included both English- and Spanish-language papers, which is likely to have facilitated additional collaborations. In contrast, this investigation concentrated exclusively on Scopus articles that were written in English, which restricted the scope of linguistic diversity and cross-regional collaborations. Consequently, the broader dataset in the previous study likely captured a broader range of co-authorship connections, illustrating the significant impact of the database and language selection on bibliometric outcomes.

The bibliometric analysis of WQ identifies numerous critical areas for improvement in various industries. In the context of e-commerce, user engagement can be significantly improved through the implementation of AI-driven tools, including dynamic pricing and customized content. Furthermore, the integration of emerging technologies such as AR/VR and big data analytics allows businesses to develop more personalized, immersive user experiences, which in turn increases satisfaction and engagement. The trust of consumers is significantly enhanced by trust-building mechanisms. The integration of customer reviews and the display of clear security features (e.g., SSL certificates) can significantly increase user loyalty and enhance trust. Businesses can refine and optimize the user experience over time by conducting continuous website evaluations using tools such as A/B testing and heatmaps. Furthermore, emphasizing enhancements to user interfaces and user experiences-including the simplification of navigation, the optimization of mobile responsiveness, and the reduction of load times-

guarantees enhanced user satisfaction and retention.

This study has several limitations that future research could address; despite the valuable insights it has provided. Initially, the Scopus database may not include high-quality publications that are not indexed there, such as newer journals or regional sources. Consequently, future research could benefit from the integration of additional databases, such as Web of Science or Google Scholar, to provide a broader perspective. Secondly, although bibliometric analysis provides quantitative insights, it does not provide the depth of qualitative understanding. To uncover more nuanced insights and thematic trends, future studies could implement a mixed-methods approach that integrates bibliometric techniques with other methods, particularly qualitative methods like expert interviews or text mining (e.g., topic modeling using Python libraries like Gensim). Third, the study's April 2024 cutoff date indicates that more recent research was not incorporated, which implies that ongoing or longitudinal studies could offer a current perspective on emerging trends. Furthermore, bibliometric techniques may introduce biases associated with keyword selection and citation patterns. Therefore, future research could investigate the use of machine learning or semantic analysis to reduce these biases and improve the objectivity of the findings. Finally, although this review offered quantitative data on research trends, it did not include a comprehensive qualitative synthesis of the underlying theories and frameworks. Future research could address this issue by incorporating in-depth qualitative analysis to gain a more comprehensive understanding of the evolving theoretical foundations and practical applications of WQ research.

Conclusion

The rising volume of literature on WQ emphasizes its escalating significance in the e-commerce sector. This study employs performance analysis and science mapping to identify principal contributors and demonstrate the thematic connections that characterize the field's intellectual framework. It reinforces the essential function of WQ in influencing consumer decisions and improving online user experiences. Ultimately, the findings offer critical insights for scholars, researchers, and policymakers seeking to tackle the evolving challenges of the digital marketplace and enhance WQ to satisfy changing consumer expectations.

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