BIBLIOMETRIC ANALYSIS OF SERVICE QUALITY: SERVQUAL RESEARCH TRENDS IN VARIOUS FIELDS FOR THE PERIOD 2012-2022

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Abstract.*The SERVQUAL bibliometric study was conducted to build a strong foundation for improving service quality in various fields or sectors in new and meaningful ways. Analysis of the number of publications and citations shows fluctuations in SERVQUAL research in various fields. Based on the Network Visualization analysis of the co-word map, research on SERVQUAL in various fields is divided into 5 clusters. (1) Cluster 1. The red color consists of 11items: Fuzzy Servqual, Healthcare service, Hospital, Industry, Level, Paper, Patient, Quality, Reliability, Sevqual Method, and Servqual Score. (2) Cluster 2. The green color consists of 8 items: Customer Satisfaction, Impact, Importance, Relationship, Review, Satisfaction, Service Quality Dimension, Servqual Dimension (3) Cluster 3. The blue color consists of 8 items: Context, Evaluation, India, Item, Measuring service quality, Model, Servqual, and Turkey. (4) Cluster4. Yellow consists of 4 items: Gap, Perception, Perspective, and Servqual Analysis. (5) Cluster 5. Purple consists of 4 items: Adaptation, Application, Case Study, and Service. The results of the bibliometric analysis of six service sector groups produced several findings. The application of dimensions and methods combined in measuring service quality shows that service quality in different sectors has a variety of approaches.*

Keywords: *Bibliometric Analysis; Dimensions; Methods;SERVQUAL*

1. INTRODUCTION

Research based on bibliometric analysis in recent years has gained tremendous popularity (Donthu et al., 2021). The popularity of bibliometric analysis is influenced by several things, namely (1) the progress, availability, and accessibility of bibliometric software such as Gephi, PoP, Leximancer, VOSviewer, and scientific databases such as Scopus, Web of Science, Google Scholar, Crosreff, PubMed and Semantic Scholar and (2) the development of cross-disciplinary bibliometric methodology. The popularity of bibliometric analysis in business research is a reflection of its usefulness for (1) handling large amounts of scientific data, and (2) generating high impact on research. Bibliometric analysis is a popular and rigorous method for exploring and analysing large amounts of scientific data (Donthu et al., 2021). Bibliometric mapping is an important topic in the field of bibliometrics (Börner et al., 2003). Two aspects of bibliometric mapping are the construction of bibliometric maps and the graphical representation of these maps. (van Eck & Waltman, 2010).

Service Quality has become one of the topics that have been widely used as the object of bibliometric analysis in recent years (J (Ali et al., 2021; Javed Ali et al., 2021; Ashiq et al., 2022; Azzari et al., 2020). This is because Service Quality is a significant concern in meeting customer expectations amidst high levels of competition (Lee et al., 2016). In retaining customers, service quality and personal abilities are important aspects that must be considered (Zaman Groff et al., 2015). Applying bibliometric analysis is useful for developing effective research channels for future analysis and research (Yas et al., 2020).

A well-conducted bibliometric study can build a strong foundation for advancing a field in new and meaningful ways, enabling and empowering researchers to (1) gain a holistic view, (2) identify knowledge gaps, (3) derive novel ideas for inquiry, and (4) position intended contributions to the field (Donthu et al., 2021). However, no

bibliometric study has discussed SERVQUAL in various fields. Therefore, this study was conducted to display bibliometric data analysis on SERVQUAL in various fields using VOSViewer to see the development of research on this from 2012-2022 and provide an easy path to data analysis using mapping tools. Thus, this study is expected to be used as a reference for conducting big data analysis on SERVQUAL in various fields.

2. LITERATURE REVIEW

2.1 Service Quality

Service quality depends on the company's capacity to produce solid service characters through the company's correspondence system because, as shown by the more positive the buyer sees the service personality, the better the buyer's attitude towards the service technique (Hapsari et al., 2017). The task of the service network describes clients with solid service evidence, self-identity, and satisfaction with the service who buy similar services reliably (Oh& Kim, 2017). Several studies have shown that service quality affects service dependency through service quality (McKecnie et al., 2011). Perceived service quality can be understood as the correlation between the company's presentation and the client's desires when negative disconfirmation, disappointment is created when convinced, and consumer satisfaction is created, expanding customer loyalty (Khudhair et al., 2019).

The most commonly used measure of service quality is the "Servqual" scale (Ladhari, 2009), originally developed and refined by Parasuraman et al. (1985,1988, 1994). SERVQUAL developed the gap theory to measure the service quality construct and conceptualized service quality as the difference (gap) between customer expectations about the service and customer perceptions ofthe actual performance of this service. Consequently, unlike objective quality, service quality can be assessed by measuring the extent to which the performance of the service offered meets customer expectations. Initially tested in five service settings: retail banking, credit card services, electrical equipment repair and maintenance, long-distance telephone services, and title brokerage (Ladhari, 2009 p. 172), the scale consists of 22 items representing five dimensions, namely "tangibles," "reliability," "responsiveness", "assurance" and "empathy." The SERVQUAL scale has been widely used to measure service quality in various industries.

Parasuraman et al. grouped the SERVQUAL scale into five dimensions, namely: 1). Reliability, namely the ability to perform the promised service dependably and accurately; 2). Assurance, namely the knowledge and courtesy of employees and their ability to inspire trust and confidence; 3). Tangibles, namely physical facilities, equipment, and appearance of personnel; 4). Empathy, namely Caring Attitude, individual attention given by the company to its customers; 5). Responsiveness, namely the willingness to help customers and provide prompt service.

2.2 Bibliometric Analysis

Bibliometrics is the application of mathematical and statistical methods to books and other means of communication (Abbas et al., 2020). It uses the quantitative analysis of empirical data in the published literature to study publication patterns in a field. This work depends on bibliometric and commitment planning investigations on service quality and customer satisfaction. This data collection provides a very advantageous, multidisciplinary position and contains the sociology of writing. Initially, the bibliometric investigation is directed to recognize the complete distribution by year, how many times mentioned by year, most mentioned authors, and favourable countries. The best ten of the most cited distributions are created. In this way, the logical planning study is completed using Scopus software, which allows the development of logical guides as a better perception of progress in the logical area (Chang et al., 2009). Scopus provides various modules that help investigators lead the science planning work process: a segment dedicated to the administration of the information base and its elements, a

module responsible for leading the science planning investigation, and a module for describing the results and guides created (Kumar et al., 2009). The importance of the study is built on three events: record check, H-Index, and all references. For each applicable investigative expression, a group of related publications is created, graphically showing the importance of each publication in the group and the relationship between all (Juhana et al., 2015).

3.   RESEARCH METHODS

The techniques applied to bibliometric analysis consist of two categories, namely: (1) performance analysis and (2) science mapping (Donthu et al., 2021). The performance analysis technique produces research constituent contributions, while the science mapping technique focuses on the relationship between research constituents. Some parts of the literature reveal the five stages of bibliometric analysis, including (1) determining search keywords, (2) starting search results, (3) improving search results, (4) compiling the earliest data statistics, and (5) conducting data analysis (Fahimnia et al., 2015) and (Setyaningsih et al., 2018).

4.   RESULTS AND DISCUSSION

Bibliometric analysis of SERVQUAL Research in various fields using PoP and VOSviewer software and carried out through five stages according to (Fahimnia et al., 2015) and (Setyaningsih et al., 2018); the results obtained are: 1) Keyword search results. A document search was conducted on August 14,2022, using PoP Software with the keywords "Service Quality" and "SERVQUAL." The database used is Google Scholar for the period 1988-2022. The results obtained were 939 documents in various forms (articles, reviews, conference papers, conference reviews, book chapters, books, short surveys, notes, and editorials). 2) Search enhancement results. Documents obtained from the keyword search "Service Quality" and "SERVQUAL". Then, they grouped based on inclusive categories. The results are 595 English-language documents and 344 non-English-language documents published from 1988-2022. Furthermore, 262 documents published by publishers were indexed by Scopus, and Scopus did not index 333 documents. Furthermore, from the 262 documents indexed by Scopus, 129 journals were obtained that discussed SERVQUAL in various fields from 2012-2022. The final result is 129 documents that meet the requirements for further analysis. The document selection stage is shown in Table 1.

Table 1. Document Selection Stage

Tahap Pencarian	Jumlah Dokumen	Jumlah Sisa Dokumen (n = 939)
Dokumen tidak berbahasa inggris	344	595
Dokumen tidak terindeks scopus	333	262
Tidak diterbitkan periode 2012-2022	133	129

3) Results of the earliest data statistics. Appropriate documents used for this study were downloaded from the Google Scholar database using two formats: Research Information System (RIS) and Comma Separated Values (CSV). The RIS and CSV formats consist of prominent information from each document, especially abstracts, keywords, bibliometric information, and bibliographic information (Hudha et al., 2020). 4) Data analysis results. The data analysis carried out consisted of two stages: Performance Analysis and Science Mapping (Donthu et al., 2021).

Performance Analysis
a) Metrics related to publications and citations. The results of the document selection process have produced 979 appropriate documents regardless of their inclusion criteria.

Furthermore, using PoP software, the display of metrics related to publications and citations can be seen in Table 2.

Table 2. Publication and Citation Metrics

Description	Results
Publication years	2012 - 2022
Citation years	2012 - 2022
Total publication	129
Total citation	6655
Authors	376
Cites/year	665,5
Cites/paper	51,59
Authors/paper	2,91
h-Index	47
g-Index	79

The data in Table 2 shows that from 2012 to 2022, 129 articles were published that were closely related to SERVQUAL research in various fields. Furthermore, there were 6655 citations, with an average of 665.5 citations per year. There were 376 authors, with an average of 2.91 per paper and 51.59 citations per paper. Other data shows that the h-index is 47 and the g-index is 79, which means that the h-index is smaller than the g-index. This is in line with the opinion of (Donthu et al., 2020), which states that the h-index is always lower than the g-index.

Based on the results of the total publications in 2012-2022 shown in Table 2, there are 47 publications indexed "h," meaning publications with the highest citations. Publications indexed "h" are grouped into six group, namely:

1). Group One (Health Service Sector). Research on SERVQUAL in the health sector is presented in the following Table 3:

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
1	Purcărea et al., 2013	273	5 Dimensi	SERVQUAL	Temuan pada dimensi Tangible	Elsevier
2	Al-Borie & Damanhouri, 2013	260	5 Dimensi	SERVQUAL	Temuan pada faktor yang mempengaruhi kepuasan pasien rawat inap.	Emerald
3	Al-Neyadi et al., 2018	125	5 Dimensi	SERVQUAL	Temuan pada dimensi Assurance	Taylor & Francis
4	Altuntas et al., 2012	121	5 Dimensi	SERVQUAL, Analytic hirarki process (AHP) dan analytic network process (ANP)	Mengusulkan *Analytic Hirarki Process (AHP)* dan *Analytic Network Process (ANP)*	Taylor & Francis
5	Li et al., 2015	115	5 Dimensi	SERVQUAL	Temuan pada faktor yang mempengaruhi	Elsevier

			kepuasan pasien rawat inap.		
6	Behdioğlu et al., 2019	92	5 Dimensi	Fuzzy SERVQUAL	Mengusulkan Fuzzy SERVQUAL	Taylor & Francis
7	Pekkaya et al., 2017	87	5 Dimensi	SERVQUAL	Temuan pada dimensi Tangible	Taylor & Francis
8	Camgöz-Akdağ et al., 2013	74	5 Dimensi	SERVQUAL & QFD	Mengusulkan pendekatan integrasi SERVQUAL dan QFD	Emerald
9	Alam & Mondal, 2019	68	5 Dimensi	SERVQUAL-AHP	Mengusulkan Metodologi gabungan model SERVQUAL dan Analytical Hierarchy Process	Elsevier

The data in Table 3 shows that nine SERVQUAL research articles in the health service sector fall into the H-Index category, where the article written by Purcărea et al., 2013 has the highest citation, namely 273 citations. All studies apply 5 SERVQUAL dimensions as a measurement scale based on the dimensions. The results of the study shown in Table 3 reveal that the Assurance and Tangible dimensions are the dimensions that have the most significant influence on patient satisfaction (Al-Neyadi et al., 2018; Pekkaya et al., 2017).On the other hand, it states that the tangible is the least important dimension because it has the highest gap score (Purcărea et al., 2013). Furthermore, in applying the SERVQUAL dimensions as a measurement scale, gender, education, income, occupation, age, and location factors influence patient satisfaction (Al-Borie & Damanhouri, 2013; Li et al., 2015).

Service quality through the SERVQUAL method can be measured through several modifications or approaches. The application of the Analytic Hierarchy Process (AHP) and Analytic Network Process (ANP) is carried out as a multi-criteria decision-making method to obtain the relationship and level of importance between service quality measurement dimensions (Altuntas et al.,2012). The Fuzzy SERVQUAL method determines the gap score in hospital service quality (Behdioğlu et al., 2019). The SERVQUAL-QFD and SERVQUAL-AHP integration approaches can improve quality and evaluate gaps (Alam &Mondal, 2019; Camgöz-Akdağ et al., 2013).

2). Group Two (Education Sector). Research on SERVQUAL in the health sector is presented in the following Table 4.

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
1	Yousapronpaiboon (2014)	363	5 Dimensi	SERVQUAL	Temuan pada pendidikan tinggi di Thailand	Elsevier
2	Lupo (2013)	161	5 Dimensi	Modifikasi SERVQUAL, Fuzzy Set Theory and the Analytic Hierarchy Process	Mengembangkan model SERVQUAL dengan menggabungkan Fuzzy Set Theory dan metode Analytic Hierarchy Process	Elsevier
3	Galeeva (2016)	132	5 Dimensi	Modifikasi SERVQUAL	Mengusulkan pendekatan baru	

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
4	Yeo & Li (2014)	128	5 Dimensi	SERVQUAL	dalam analisis data dan penyajian temuan Mengusulkan tiga aspek kunci dari standar layanan: (1) orientasi pelanggan, (2) desain kursus, dan (3)layanan dukungan.	Emerald Taylor & Francis
5	Akhlaghi et al., (2012)	110	5 Dimensi	SERVQUAL	Temuan pada dimensi Responsiveness	Elsevier
6	Abili et al., (2012)	73	5 Dimensi	SERVQUAL	Temuan pada dimensi Responsiveness	Emerald

The data in Table 4 shows that six SERVQUAL research articles in the education sector fall into the H-Index category, where the article written by Yousapronpaiboon (2014) has the highest citation rate, namely 363 citations. Furthermore, each of these studies applies the 5 SERVQUAL dimensions. Analysis of the SERVQUAL dimensions is an effort to find discrepancies in student expectations in higher education (Yousapronpaiboon, 2014). Based on Table 4, two studies have modified the SERVQUAL method, namely Modified SERVQUAL by combining the Fuzzy Set Theory and the Analytic Hierarchy Process and a new approach in data analysis and presentation of findings to improve the classic SERVQUAL method, which has always received criticism (Galeeva, 2016; Lupo, 2013)

Research conducted (Abili et al., 2012; Akhlaghi et al., 2012) found that Responsiveness is the dimension that has the most significant gap in the higher education sector. Furthermore (Yeo and Li, 2014) proposed three key aspects of higher education service standards, namely: (1) customer orientation, (2) course design, and (3) support services.

3).Group Three (Hotel and Tourism Sector). SERVQUAL research in the Hotel and Tourism sector is presented in Table 5 below:

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
1	Stefano et al (2015)	175	6 Dimensi	Modifikasi SERVQUAL	Mengusulkan metode fuzzy SERVQUAL and fuzzy AHP	Elsevier
2	Bhat (2012)	101	4 Dimensi	Modifikasi SERVQUAL	Temuan pada dimensi Reliability dan Responsiveness	SAGE
3	Tsang et al (2012)	90	7 Dimensi	Modifikasi SERVQUAL	Mengusulkan model THEMEQUAL	Taylor & Francis
4	Hansen, 2014	89	5 Dimensi	SERVQUAL, DINESERV, and meal experience models	Mengusulkan model SERVQUAL, DINESERV, dan meal experience models	Taylor & Francis
5	Behestenia & Azad (2019)	62	5 Dimensi	SERVQUAL	Mengusulkan model hybrid (model House of Quality (HOQ)-SERVQUAL-Kano)	

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
6	Shafiq et al (2019)	48	5 Dimensi	SERVQUAL	Temuan pada dimensi Tangibility	Taylor & Francis / Emerald
7	Hansen,(2014)	89	5 Dimensi	SERVQUAL, DINESERV, and meal experience models	Penelitian ini mengembangkan alat pengukuran untuk pengalaman makan dengan menggabungkan model SERVQUAL, DINESERV, dan pengalaman makan.	Taylor & Francis

Table 5 shows seven SERVQUAL research articles in the Hotel and Tourism sector that fall into the H-Index category. The article written by Stefano et al. is the article with the highest citation rate, namely 175 citations. Based on the table above, four articles apply modified SERVQUAL dimensions (Stefano et al.,2015). Proposed the fuzzy SERVQUAL and fuzzy AHP methods to assess service quality by adding the Access dimension. (Tsang et al., 2012) Proposed the THEMEQUAL model as a modification of SERVQUAL by applying 5 SERVQUAL Dimensions and additional dimensions, namely the Access dimension and the Courtesy dimension (Beheshtinia & Farzaneh Azad, 2019). Proposed a hybrid model using the House of Quality (HOQ), SERVQUAL, and Kano models.

The research conducted by (Bhat, 2012) through the modification of the 4 SERVQUAL dimensions and the results showed that Reliability and Responsiveness were the dimensions that had the lowest influence among the other dimensions. Furthermore, (Shafiq et al., 2019) applied five dimensions of SERVQUAL to hotel services and found that in addition to Tangibility, all SERVQUAL dimensions have a significant effect and are positively related to customer satisfaction. Furthermore, (Hansen, 2014) applied SERVQUAL, DINESERV, and meal experience models. The results of his study showed six important aspects of hotel services: core product, restaurant interior, personal social meeting, company, restaurant atmosphere, and management control system.

4).Group Four (Banking Sector). Research on SERVQUAL in the banking sector is presented in Table 6 below:

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
1	M Ali & S A Raza (2017)	449	6 Dimensi	Modifikasi SERVQUAL	Mengusulkan Compliance sebagai dimensi tambahan SERVQUAL	Taylor & Francis
2	Raza et al (2020)	164	2 Dimensi	Modifikasi SERVQUAL	Menyarankan model E-SERVQUAL	Emerald
3	Charles & Kumar (2014)	69	5 Dimensi	SERVQUAL	Menerapkan Model DEA-SERVQUAL.	Elsevier
4	Ahmed et al(2017)	64	4 Dimensi	Modifikasi SERVQUAL	Temuan pada model empat dimensi SERVQUAL yang dimodifikasi	Taylor & Francis
5	Dinçer et al (2019)	48	5 Dimensi	SERVQUAL	Menerapkan Hesitant fuzzy set pada Seluruh Dimensi SERVQUAL	Elsevier

The data in Table 6 shows that there are five SERVQUAL studies in the banking sector that fall into the H-Index category, where the article by M Ali & S A Raza has the highest citation, namely 449 citations. Based on the table above, three articles apply the modified SERVQUAL dimensions (M. Ali & Raza, 2017). The addition of the Compliance dimension shows the important role of the five SERVQUAL dimensions.

(Raza et al., 2020) suggests a modified E-SERVQUAL model that links it to e-customer satisfaction and e-customer loyalty. Finally, (Ahmed, 2017) shows that the modified four-dimensional SERVQUAL model (empathy, competence, reliability, and online service) significantly impacts overall customer satisfaction. The research (Charles & Kumar, 2014) applied the DEA Model and successfully measured the relative efficiency in determining the SERVQUAL gap. Furthermore (Dinçer et al., 2019) Implemented Hesitant fuzzy sets on all SERVQUAL Dimensions, which are important in improving service quality.

5).Group Five (Transportation Sector)/ Research on SERVQUAL in the transportation sector is presented in the following Table 7:

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
1	Basfirinci, et al (2015)	243	5 Dimensi	SERVQUAL & Kano	Temuan pada seluruh dimensi SERVQUAL dan Model Kano	Elsevier
2	Rezaei et al (2018)	213	5 Dimensi	SERVQUAL	Temuan pada dimensi Reability & Responsiveness	Elsevier
3	Barabino et al (2012)	163	5 Dimensi	SERVQUAL & EN 13816	Mengusulkan tiga atribut pada kualitas layanan	Emerald
4	Sam et al (2018)	87	5 Dimensi	SERVQUAL	Temuan pada dimensi Reability & Responsiveness	Elsevier
5	Khorshidi et al	67	5 Dimensi	SERVQUAL & QFD	Mengusulkan penerapan SERVQUAL & QFD	Emerald

The data in Table 7 shows that five SERVQUAL studies in the transportation sector fall into the H-Index category, where the article by Basfirinci et al. has the highest citation, namely 243 citations. The research (Basfirinci & Mitra,2015) revealed that the Servqual gap score was negative in the United Statesand Turkey in all areas of service quality. For the Kano model, it is shown that the general structure of the scale is the same for both countries.

Research conducted by (Rezaei et al., 2018; Sam et al., 2018) showed the same results: Reliability and Responsiveness are considered the most important dimensions to describe the quality of bus services in the city. Research conducted by (Barabino et al., 2012) describes three important attributes in the quality of land transportation services: On-board safety, bus reliability, and cleanliness. Furthermore, (Khorshidi et al., 2016) successfully applied SERVQUAL & QFD to determine service quality through a structured framework.

6).Group Six (Other Sectors). Research on SERVQUAL in the government agency, Logistics Services, Mobile Services, Manufacturing, and Non-Profit Organization sectors is presented in the following Table 8:

No	Penulis	Sitasi	Dimensi SERVQUAL	Metode	Novelty (Berdasarkan Masalah/ Metode)	Penerbit
1	Ocampo et al (2019)	77	5 Dimensi	SERVQUAL-AHP	Temuan pada dimensi Responsiveness	Elsevier
2	Roslan et al (2015)	100	6 Dimensi	Modifikasi SERVQUAL	Mengusulkan Dimensi Service Cost sebagai tambahan Dimensi SERVQUAL	Elsevier

3	Prentkovkis et al (2018)	69	5 Dimensi	Delphi, FUCOM & SERVQUAL	Mengusulkan integrasi model Delphi, FUCOM & SERVQUAL	MDPI
4	Samen et al (2013)	102	5 Dimensi	SERVQUAL	Temuan pada dimensi SERVQUAL dari sudut pandang pelanggan, manajer dan karyawan	Emerald
5	Alnshour et al (2014)	63	5 Dimensi	SERVQUAL	Temuan pada dimensi SERVQUAL dari sudut budaya konsumen	Emerald
6	Liu et al (2015)	85	5 Dimensi	SERVQUAL model and fuzzy set theory	Mengusulkan Metode HIbrid yang berbasis SERVQUAL model and fuzzy set theory	Elsevier
7	Jones & Shadiz (2015)	63	5 Dimensi	SERVQUAL	Temuan dimensi SERVQUAL yang berbeda dan peran perspektif yang berperan dalam skenario nirlaba.	Taylor & Francis

The data in Table 8 shows that seven SERVQUAL studies in the Government Agency, Logistics Services, Mobile Services, Manufacturing, and Non-Profit Organization sectors fall into the H-Index category, where the article written by Abu El-Samen et al. is the article with the highest citation, namely 102 citations. SERVQUAL research in the logistics services sector was conducted (Roslan et al., 2015) through the application of a modification of the SERVQUAL dimension by adding the Service Cost dimension, and the results prove that there is a relationship between customer satisfaction and service quality dimensions at the Iskandar Malaysia logistics service provider. Furthermore, (Prentkovskis et al., 2018) applied Delphi, FUCOM, and SERVQUAL to determine the level of process quality and sustainability activities in the logistics services sector.

SERVQUAL research in the mobile service sector (Alnsour et al., 2014; Samen et al., 2013) shows that service quality from consumers, employees, and managers affects satisfaction and loyalty. Meanwhile, research in the government agency sector was conducted (Ocampo et al., 2019), which applied the SERVQUAL-AHP method. The study results showed that the Responsiveness Dimension is the most important in providing the highest service quality. The Hybrid method based on SERVQUAL and fuzzy set theory was applied (Liu et al.,2015) in the manufacturing sector, where the results obtained showed that the tangible dimension is the dimension that has the most significant gap in the certification and inspection industry in China.

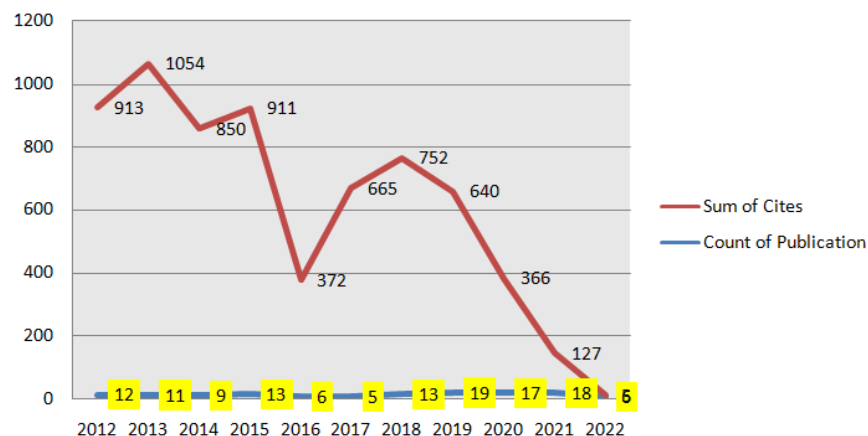b) Analysis of publication and citation trends

Figure 1. Trend of Publication and Document Citations 2012-2022.

Figure 1 data shows that the number of studies on SERVQUAL in various fields fluctuates. In 2013 and 2014, there was a decrease in publications, namely from 12 studies throughout 2012 to 11 and 9 publications. 2015, there was an increase of 13 publications, which decreased again in 2016 to 6 publications and five publications in 2017. In 2018-2022, there were consecutive fluctuations, namely 13 publications in 2018, increasing to 19 publications in 2019, decreasing again to 17 publications in 2020, and increasing to 18publications in 2021. Furthermore, there is a possibility that it will increase in 2022 because six publications are indicating a trend of SERVQUAL research in various fields.

Science Mapping

Co-Word Analysis was conducted through VOSviewer software to investigate existing or future topics related to the research field by concentrating on writing the content of publishing documents (Donthu et al., 2021). The analysis was conducted to provide the most frequently appearing keywords in the Service Quality study in Higher Education. Furthermore, the results of this analysis play a role in distributing the most frequently appearing keywords in the last period.

a) Network Visualization
The Network Visualization analysis in Figure 2 is used to find the most frequently appearing keywords by selecting words that will appear in 26 related keywords in five clusters, as shown in red, green, blue, and yellow.
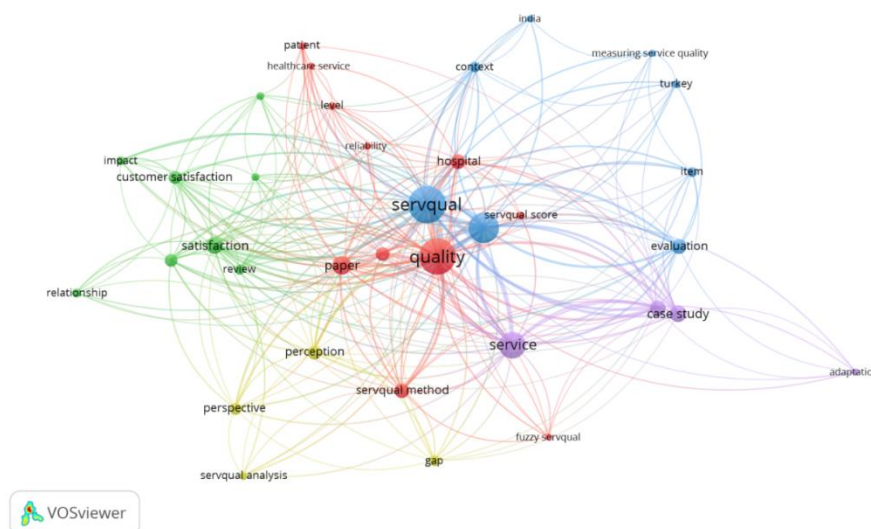

Figure 2. Network Visualization of SERVQUAL Research in various fields.

The results of the Network Visualization co-word map in Figure 2 show the development of research on SERVQUAL in various fields, divided into 5 clusters, as follows: 1) Cluster 1. The red colour consists of 11 items: Fuzzy Servqual, Health Care Service, Hospital, Industry, Level, Paper, Patient, Quality, Reliability, Sevqual Method, and Servqual Score. 2) Cluster 2. The green colour consists of 8 items, namely: Customer Satisfaction, Impact, Importance, Relationship, Review, Satisfaction, Service Quality Dimension, Servqual Dimension. 3) Cluster 3. The blue colour consists of 8 items: Context, Evaluation, India, Item, Measuring Service Quality, Model, Servqual, and Turkey. 4) Cluster 4. The yellow color consists of four items: Gap, Perception, Perspective, and Servqual Analysis.5) Cluster 5. The purple colour consists of four items: Adaptation, Application, Case Study, and Service.
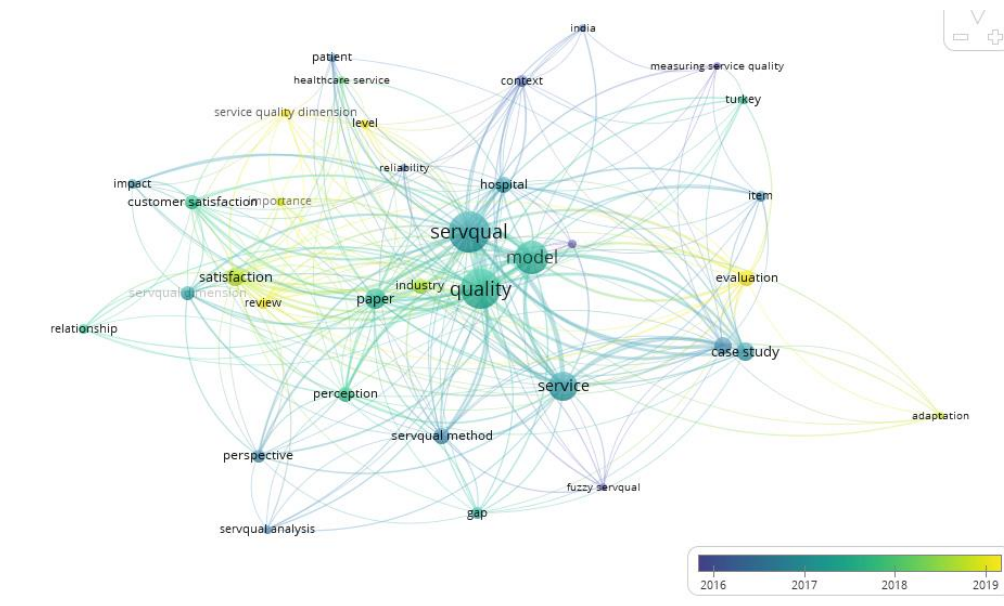
b) Overlay Visualization

Figure 3. Overlay Visualization of SERVQUAL Research in various fields.

Figure 3 shows the relationship between keywords based on the publication period. The yellow colour indicates keywords that are trending in the latest year, namely 2019. Based on the results of Overlay Visualization, four trending keywords were found: Service Quality Dimension, Level, Evaluation, and Review.
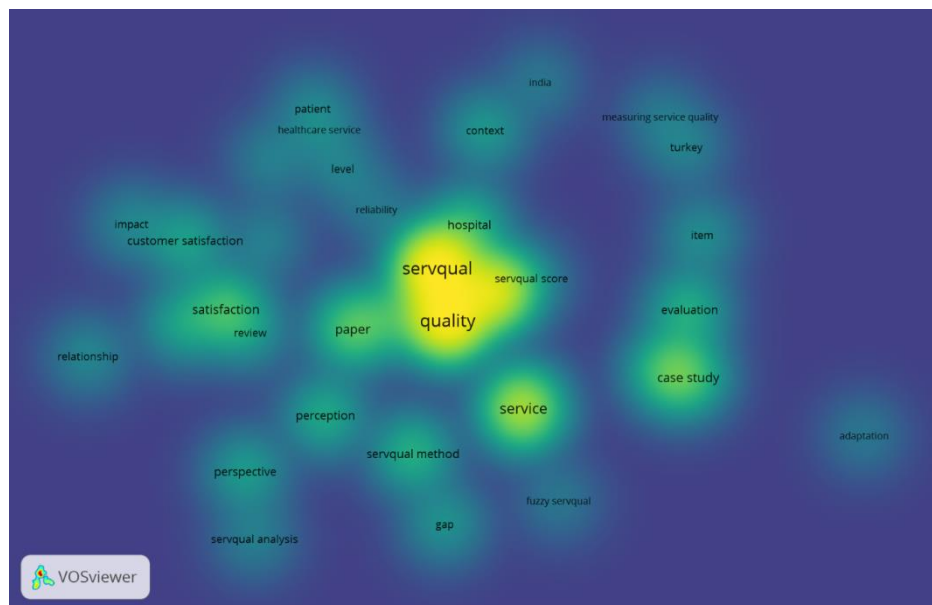
c) Density Visualization

Figure 4. Density Visualization of SERVQUAL Research in various fields.

The cluster density display in Figure 4 shows items marked the same as the visible items. Item points have a colour depending on the item's density at that time. The item can identify that the colour of the dots remains dependent on the items related to other items. The Co-Word Density Map is useful for obtaining an overview of the general

structure of the bibliometric map by showing which items are considered important to analyse (Muñoz-Leiva et al., 2012).

The research data shown in Figure 4 can be interpreted as the most widely used keywords in a publication that shows the visualization of the development of co-word density map research on SERVQUAL in various fields. Figure 4 shows a density map resulting from an analysis using all SERVQUAL articles in various fields in 2012-2022. The density map means that the more yellow the colour with the largest circle diameter, the denser the keywords are, meaning they appear more often, and if the colour fades, it blends with the green background and appears less often (van Eck & Waltman, 2010)

CONCLUSION

The bibliometric analysis of SERVQUAL was conducted to build a strong foundation for improving service quality in various fields or sectors in a new and meaningful way. Analysis of the number of publications and citations shows fluctuations in SERVQUAL research in various fields. Based on the Network Visualization analysis of the co-word map, research on SERVQUAL in various fields is divided into 5 clusters. (1) Cluster 1. The red colour consists of 11 items: Fuzzy Servqual, Health care service, Hospital, Industry, Level, Paper, Patient, Quality, Reliability, Sevqual Method, and Servqual Score. (2) Cluster 2. The green color consists of 8 items: Customer Satisfaction, Impact, Importance, Relationship, Review, Satisfaction, Service Quality Dimension, Servqual Dimension (3) Cluster 3. The blue color consists of 8 items: Context, Evaluation, India, Item, Measuring service quality, Model, Servqual, and Turkey. (4) Cluster 4. Yellow consists of 4 items: Gap, Perception, Perspective, and Servqual Analysis. (5) Cluster 5. Purple colour consists of 4 items: Adaptation, Application, Case Study, and Service. The results of bibliographic analysis on six service sector groups produced several findings.

1) Health Service Sector. Assurance and Tangible dimensions have the greatest influence on health services. Several combination methods are applied in SERVQUAL research inthe health service sector, namely: Application of Analytic Hierarchy Process (AHP)—Analytic Network Process (ANP), Fuzzy SERVQUAL Method, SERVQUAL-QFD integration approach, and SERVQUAL-AHP.

2) Education Sector. Responsiveness is a dimension with the largest gap in the higher education sector. Several combination methods were applied to SERVQUAL research in the field of education, namely SERVQUAL by combining Fuzzy Set Theory and the Analytical Hierarchy Process and a new approach to data analysis and presentation of findings.

3) Hotel and Tourism Sector. Several modifications of SERVQUAL dimensions in the hotel and tourism sector, namely: Modification of SERVQUAL dimensions and Access dimensions, Courtesy dimensions. Furthermore, several combination methods were applied to SERVQUAL research in the hotel and tourism sector: fuzzy SERVQUAL and fuzzy AHP methods, THEMEQUAL models, Hybrid models using the House of Quality (HOQ) model, SERVQUAL and Kano.

4) Banking Sector. Research in the banking sector applies modified SERVQUAL dimensions, namely, five SERVQUAL dimensions with the addition of Compliance dimensions, Internet banking dimensions, and four modified SERVQUAL dimensions (empathy, competence, reliability, and online service). Furthermore, several combination methods are applied to the banking sector SERVQUAL research: a modified E-SERVQUAL model that links it to electronic customer satisfaction and loyalty, the DEA Model, and Hesitant fuzzy sets.

5) Transportation Sector. Reliability and Responsiveness are considered the most important dimensions in describing the quality of transportation services. SERVQUAL and QFD are further applied to determine service quality.

6) Other Sectors (government agencies, Logistics Services, mobile services, Manufacturing and Non-Profit Organizations). SERVQUAL research in the logistics services sector modifies the SERVQUAL dimension by adding the Service Cost

dimension. More Delphi, FUCOM, and SERVQUAL methods are applied to the logistics services sector. SERVQUAL research in the mobile services sector applies the SERVQUAL-AHP method. The Hybrid method based on SERVQUAL and fuzzy set theory is applied to the manufacturing sector.

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