

Everything is Going Electronic, so do Services and Service Quality: Bibliometric Analysis of E-Services and E-Service Quality

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Abstract—Purpose: The purpose of the study was to explore the developments in ‘e-services and e-service quality’ from 2000 to 2020. **Data Source:** Scopus database was used to conduct the bibliometric analysis of 404 documents. **Method:** VOSviewer software was used to analyse the research articles associated with ‘e-services and e-service quality’ research. Search was limited to keywords of ‘e-services OR e-service and e-service quality’. **Findings:** Results revealed that the field of ‘*Business, Management and Accounting*’ had the highest number of publications. *Total Quality Management and Business Excellence* was found at the top among the most productive journals in chosen search. Chang W.-I. and Yuan S.-T. from Taiwan were found to be the leading authors among top ten authors. United States and National Cheng Kung University of Taiwan were found to be the leading country and institution in the selected search of e-service and e-service quality. **Originality/Value:** This study, to best of our knowledge, is the first of its kind in mapping the ‘e-services and e-service quality’ literature in Scopus. This will aid in shaping the central theme and set the future research directions for the researchers.

Keywords—e-services, e-service quality, bibliometric analysis

1 Introduction

Bibliometric analysis is a tool which is used to explore the trends and developments in the body of knowledge. It is the empirical and theoretical works of various researchers whose valuable contributions develop certain discipline, area or construct overtime [1], [2]. Bibliometric analysis is a quantitative approach which helps to identify and analyze the data related with keywords used and searched in the literature, their relationships, the number of articles published in a particular time frame and their

citations [3]–[5]. The current paper is intended to review e-services and e-service quality research by using bibliometric technique.

Services are defined by Lovelock & Wirtz, (2004), as “economic activities between two parties, implying an exchange of value between seller and buyer in a marketplace”. When the services are performed in cyberspace such as using technologies, they are termed as e-services. As customers evaluate other services, they also evaluate e-services and their performances. Therefore, e-service quality is the consumer’s evaluation and judgement of services in virtual markets and cyberspace [7].

Few studies had performed bibliometric analysis on service quality. Ali et al., [8] reviewed the concept of service quality in healthcare by using bibliometric analysis. Altıntaş et al., [9] used bibliometric analysis for e-tailing service. A review and bibliometric analysis of service quality, and customer satisfaction was conducted by Yas et al., [10] and they had used Scopus database. But to the best of our knowledge, this was the first bibliometric study on e-services and e-service quality. Therefore, the purpose of current paper was to explore and comprehend the trends and developments of e-services and e-service quality globally. Following research questions were addressed by the current paper.

RQ 1. What is the publication output of ‘e-services and e-service quality’ search across the years?

RQ 2. What are the most prominent authors and journals that contributed to the development of ‘e-services and e-service quality’ research?

RQ 3. What are the most productive institutions and countries in ‘e-services and e-service quality’ search?

RQ 4. What is the bibliometric mapping of ‘e-services and e-service quality’ search in terms of authors, countries, keywords, and documents?

2 Method

Bibliometric analysis is a technique utilized by researchers to understand the global trends of a chosen research area in the database of academic literature. It makes it different from the review paper which discusses the latest developments, challenges and critics, and future directions of a specific research area [2], [8].

2.1 Data source & search strategy

The Scopus database was the source of data of the current study. It is considered as the largest citation and abstract database of peer-reviewed literature which cover a wide array of subjects [2], [5]. Data were extracted for the bibliometric analysis from the database from the date of May 20, 2021, to May 25, 2021. The search string was mainly focused on the central theme that was ‘e-service quality’. It was further limited to exact keywords such as e-service quality, e-services, and e-service which resulted in 1002 documents. The oldest publication was found in the year 2000. Therefore, trend of publication was mentioned from 2000 till 2020.

The search was then limited to document type – articles, source type – journals, language – English, and the year 2021 was excluded. The final documents were 404 which were utilized for the analysis. The search process flow is shown in the Figure 1 and the search string is given in Appendix 1.

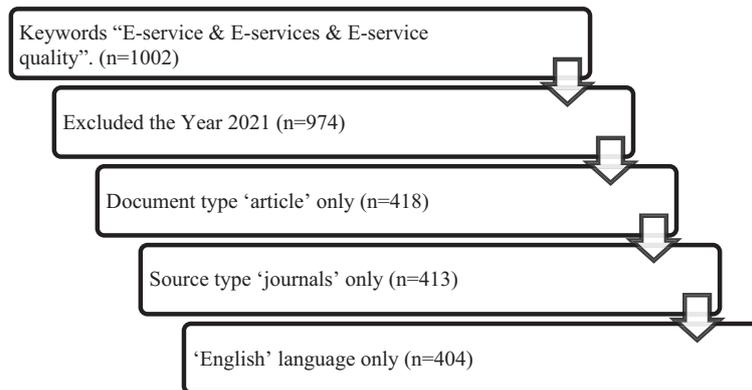


Fig. 1. Search process flow

3 Analysis & results

We executed the bibliometric analysis on 404 documents. We analyzed the publication output across timeframe, the most productive journals and authors, the most prominent countries and institutions, contributions across different disciplines, co-authorship for authors and countries, co-occurrence of author keywords, and bibliographic coupling of documents.

3.1 Publication output

For the 20 years of search, 404 research papers had been published (Figure 2). The oldest paper was published in 2000 and the recent one was in 2020 as 2021 was excluded. Till 2005, less than 10 documents were published per year. After 2005, there was increasing number of publications in e-services and e-service quality research. In 2005, Parasuraman et al., [11] developed multi-item e-s-qual scale to measure e-service quality which could triggered the publications in said area. Overall trend of publication was increasing across the years. We found 2019 was the highest publication year with 46 documents. Most of the papers were published in the field of Business, Management and Accounting (27%) followed by Computer Science (26%) and Social Sciences (13%). All other fields and subjects witnessed less than 10% in e-services and e-service quality research (Figure 3).

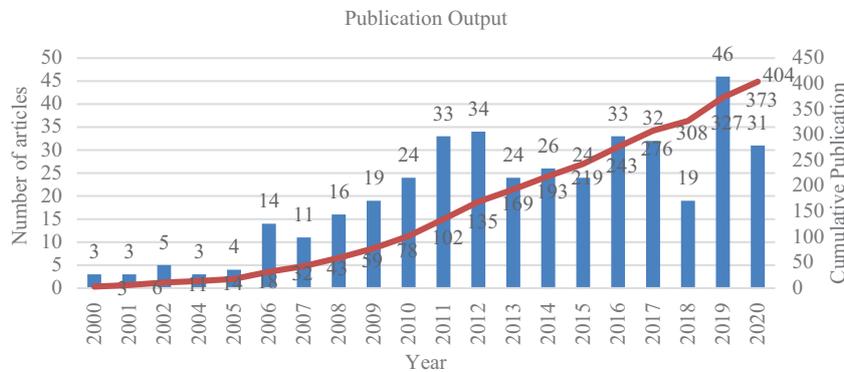


Fig. 2. Publication output

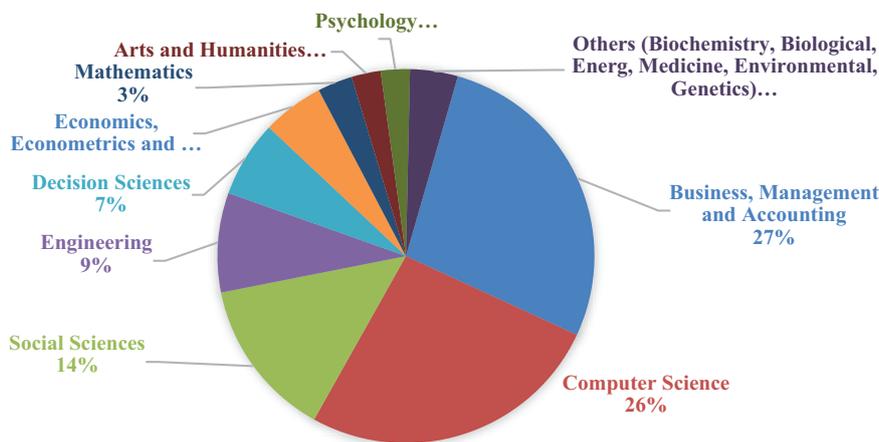


Fig. 3. Distribution of documents across subjects

3.2 Most productive journals and prominent authors

We analyzed the most productive journals and the most prominent authors in e-services and e-service quality research. Our results revealed the top 10 most productive journals and prominent authors in the ‘e-services and e-service quality’ research in Table 1 & Table 2. *Total Quality Management and Business Excellence* was found at the top with the most publications with 4.6 cite score (2019) and it was published by *Taylor and Francis*. It was followed by *Information Technology and People* and *Service Industries Journal*, and they were published by *Emerald* and *Taylor and Francis*, respectively. All top ten journals were mentioned in Table 1.

Table 1. List of top ten journals

S/ No	Journal	TP (%)	Cite Score 2019	The Most Cited Article	Times Cited	Publisher
1	Total Quality Management and Business Excellence	10	4.6	A. <i>The impact of e-service quality, customer satisfaction and loyalty on e-marketing: Moderating effect of perceived value</i>	225	Taylor & Francis
2	Information Technology and People	8	3.1	B. <i>Factors influencing consumer intention in social commerce adoption</i>	55	Emerald
3	Service Industries Journal	8	3.3	C. <i>Measuring the antecedents of e-loyalty and the effect of switching costs on website</i>	49	Taylor & Francis
4	Electronic Government	7	1.5	D. <i>Significant socio-economic factors for local e-government development in Portugal</i>	49	Inderscience
5	Expert Systems with Applications	7	11.0	E. <i>A combined fuzzy AHP and fuzzy TOPSIS based strategic analysis of electronic service quality in healthcare industry</i>	262	Elsevier Top of Form
6	Industrial Management and Data Systems	7	7.9	F. <i>Determinants of satisfaction and continuance intention towards self-service technologies</i>	158	Emerald
7	International Journal of Services, Technology and Management	6	0.4	G. <i>Customer-based innovation of knowledge e-services: The importance of after-innovation</i>	32	Inderscience
8	Journal of Internet Commerce	6	3.7	H. <i>Consumer's Perception of Website Service Quality: An Empirical Study</i>	23	Taylor & Francis
9	Computers in Human Behavior	5	12.1	I. <i>What drives consumer knowledge sharing in online travel communities? Personal attributes or e-service factors?</i>	49	Elsevier
10	Electronic Commerce Research and Applications	5	6.9	J. <i>How to design personalization in a context of customer retention: Who personalizes what and to what extent?</i>	49	Elsevier

Our results revealed top ten authors who had contributed to the development in e-service and e-service quality. Chang W.-I. and Yuan S.-T. were at the top with total publication of 04 and both authors were from Taiwan. They were followed by Ba S. and Boyer K.K. from United States. All the facts regarding top ten authors were mentioned in table.

Table 2. List of top ten authors

No	Author	Scopus Author ID	Year of 1st Publication*	TP	h-index	TC	Current Affiliation	Country
1	Chang W.-L.	7404564732	2009*	4	9	28	National Taipei University of Technology, Taipei,	Taiwan
2	Yuan S.-T.	14049457500	2008*	4	13	52	National Chengchi University, Taipei,	Taiwan
3	Ba S.	56126274300	2007*	3	18	60	University of Connecticut, Storrs,	United States
4	Boyer K. K.	35512115800	2002*	3	36	407	The Ohio State University, Columbus,	United States
5	Chang H. H.	13309983900	2009*	3	25	256	National Cheng Kung University, Tainan,	Taiwan
6	Featherman M. S.	6506439458	2006*	3	15	167	Carson College of Business, Pullman,	United States
7	Machiraju V.	55927088400	2000***	3	6	6	Springer-Verlag, Berlin,	Germany
8	Marimon F.	6504405453	2011**	3	22	90	Universitat Internacional de Catalunya, Barcelona,	Spain
9	Nijkamp P.	7102958684	2011**	3	62	30	Vrije Universiteit Amsterdam,	Netherlands
10	Rahi S.	57003177500	2019*	3	12	49	University of the Punjab, Lahore,	Pakistan

Notes: *First Author, ** Second Author, *** Third Author.

3.3 The leading countries and institutions

We analyzed the leading countries and institutions in our search. United States was found at the top with 76 total publications for countries (TPC). It was followed by Taiwan (TPC, 51) and India (TPC, 30). Other top countries were mentioned in Figure 4. Among the top ten institutions, National Cheng Kung University in Taiwan was leading the others with total publications (TPI) of 06, followed by Hewlett Packard Laboratories of United States with 05 TPI. Other leading institutions were mentioned in Figure 4.



Fig. 4. Top countries and institutions

3.4 Bibliometric maps

VOSviewer (Centre for Science and Technology Studies, Leiden University, Netherlands) was the software that was used in mapping the literature of e-service quality research. It was a software which read the bibliometric maps pertaining to citations, author keywords and bibliographical information of databases. Maps include the items which represent the names of documents, authors, countries, and keywords. These items relate to each other by the link and its strength. This link is showed with positive numerical value. The higher the value, the higher the link strength between two items [12], [13], [14].

3.5 Co-authorship (authors)

The co-authorship analysis represents two authors contribute to a publication together. It is the link strength between two authors who have coauthored the number of publications. However, the total link strength (TLS) shows the total co-authorship strength of a selected author with other authors.

We applied different thresholds while executing co-authorship. Maximum number of authors per document was 25. The minimum number of documents of an author was 01, and minimum number of citations was remained 00. After applying these criteria,

all the authors (n=975) met the threshold. We found that Li H., Lu J., and Nijkamp P. had the highest total link strength (TLS) which was 09, followed by Wu D. who had got 8 TLS. All other details such as number of documents and citations of these authors and others were mentioned in Table 3.

Screenshots of the co-authors were created from two types of maps. Figure 5 represented the map of all authors included in the analysis (n=975). It also contained the items which were not connected with other items. The layout for visualization of not connected set was set as its attraction value was 03 and repulsion was 02. Figure 6 represented the connected set of items (authors) which contained the largest connected set of 15 items (authors).

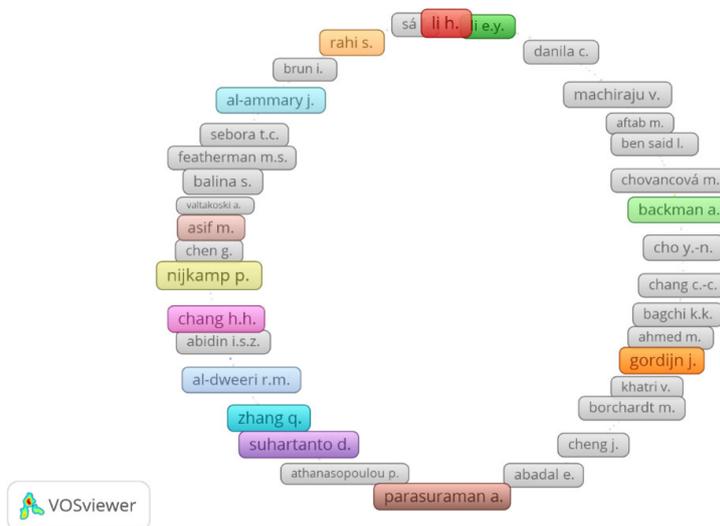


Fig. 5. Screenshot of co-authorship (Authors): not connected set

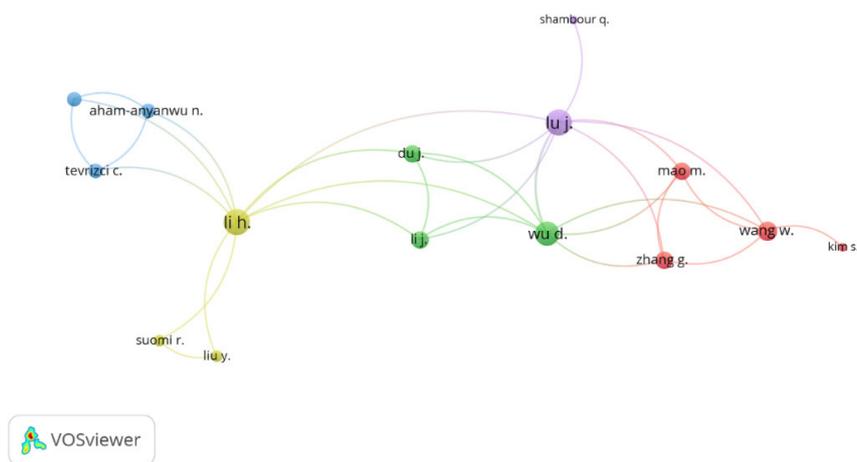


Fig. 6. Screenshot of co-authorship (Authors): connected set

Table 3. List of authors as per TLS

Item (Author)	Documents	Citations	TLS	Item (Author)	Documents	Citations	TLS
Li H.	3	53	9	Yin Q.	1	24	6
Lu J.	3	776	9	Yuan S.-T.	4	52	6
Nijkamp P.	3	30	9	Zarina L.	2	1	6
Wu D.	2	699	8	Zhang Z.	3	60	6
Chang H.H.	3	256	7	Zhou C.	1	24	6
Gordijn J.	2	15	7	Agrawal V.	2	7	5
Parasuraman A.	2	1976	7	Al-Ammary J.	1	4	5
Suhartanto D.	2	47	7	Al-Kaabi R.	1	4	5
Zhang Q.	2	30	7	Al-Soufi A.	1	4	5
Al-Dweeri R.M.	2	12	6	Ali H.	2	9	5
Alonso A.	1	1	6	Aljawder M.	1	4	5
Ba S.	3	60	6	Alrayes A.	1	4	5
Backman A.	1	4	6	Asif M.	1	5	5
Balina S.	2	1	6	Brohman M.K.	1	35	5
Barra E.	1	1	6	Bukhari M.H.	1	5	5
Baumgarte D.	2	1	6	Chawla S.	1	2	5
Bölte S.	1	4	6	Cho Y.-N.	1	7	5
Chen Y.-C.	3	44	6	Choi C.S.	1	7	5
Frostvittra M.	1	4	6	Hayes J.P.	1	2	5
Gordillo A.	1	1	6	Hernández-Soriano F.	2	13	5
Hirvikoski T.	1	4	6	Hussain A.	1	5	5
Huang S.	1	24	6	Hwang J.	1	5	5
Keith-Bodros G.	1	4	6	Jameel A.	1	5	5
López-Pernas S.	1	1	6	Johnson J.H.	1	2	5
Machiraju V.	3	6	6	Jr.	1	2	5
Marco L.	1	1	6	Kathawala Y.A.	1	2	5
Marimon F.	3	90	6	Kim K.H.	1	7	5
Mellblom A.	1	4	6	Kim S.J.	1	7	5

(Continued)

Table 3. List of authors as per TLS (*continued*)

Item (Author)	Documents	Citations	TLS	Item (Author)	Documents	Citations	TLS
Munoz-Arcentales A.	1	1	6	Ko E.	1	7	5
Neuts B.	2	26	6	Li L.	2	29	5
Norman-Claesson E.	1	4	6	Martin P.	1	35	5
Pozo A.	1	1	6	Mirchandani D.A.	1	2	5
Quach D.-C.	1	24	6	Ouyang J.	2	5	5
Rahi S.	3	49	6	Piccoli G.	1	35	5
Romão J.	2	26	6	Sahito N.	1	5	5
Sahai A.	3	6	6	Sarkees M.E.	1	7	5
Skilters J.	2	1	6	Tripathi V.	2	7	5
Stallaert J.	3	60	6	Wang W.	2	681	5
Van Leeuwen E.	2	26	6	Watson R.T.	1	35	5
Vasilakos A.V.	1	24	6	Zulkernine F.	1	35	5
Xiong N.	1	24	6				

3.6 Co-authorship (countries)

We then conducted co-authorship analysis for countries. It was the mapping of associations and affiliations among countries. Our results showed a total of 70 items in which few of the names were not representing any countries. Those names were excluded from the analysis. Thresholds were set as the minimum number of documents of a country was 01 and the minimum number of citations was 00.

Maps of connected and not connected sets of items (countries) were shown in Figure 7 and Figure 8. The largest set of connected items (countries) was 47. Its layout values were based on attraction (05) and repulsion (02). For the map of not connected set, attraction and repulsion values were set on 06 and 01, respectively. Result of co-authorship among countries revealed that United States was far ahead of other countries with total link strength (TLS) of 42 and 76 publications with 5226 citations. It was followed by China (TLS, 20; Documents, 27; Citations, 432) and United Kingdom (TLS, 20; Documents, 23; Citations, 492). The list of all countries and their association strength was mentioned in Table 4.

Results also revealed some countries which did not collaborate with other countries in chosen research area. Brazil, Iraq, Denmark, Japan, Poland, Russian Federation, and others mentioned in table were among those countries which had 00 total link strength.

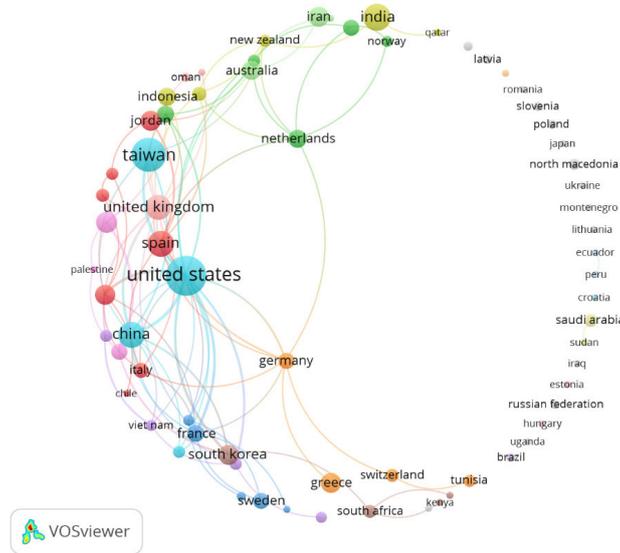


Fig. 7. Screenshot of co-authorship (Countries): not connected set

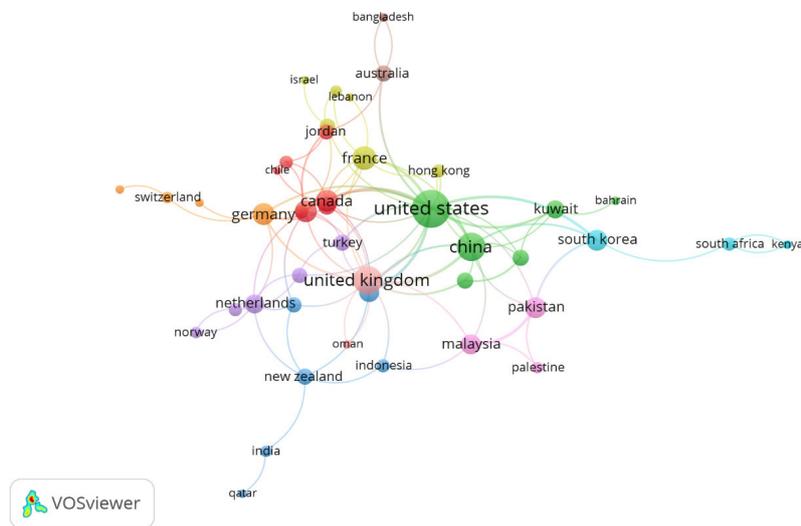


Fig. 8. Screenshot of co-authorship (Countries): connected set

Table 4. List of countries as per TLS

Item (Country)	Documents	Citations	TLS	Item (Country)	Documents	Citations	TLS
United States	76	492	39	Bangladesh	1	4	1
China	27	432	20	Chile	1	4	1
United Kingdom	23	44	20	Ecuador	1	11	1
France	9	217	12	Greece	13	156	1
Canada	13	637	10	Iran	13	95	1
Germany	8	473	10	Israel	2	86	1
Spain	25	249	10	Kenya	1	5	1
Pakistan	8	0	9	Lebanon	1	8	1
South Korea	14	71	9	Oman	2	50	1
Malaysia	16	328	8	Peru	1	19	1
Taiwan	51	134	8	Qatar	1	141	1
Netherlands	11	591	7	Saudi Arabia	5	10	1
Italy	7	133	6	Sri Lanka	1	523	1
Kuwait	4	28	6	Sudan	1	41	1
Australia	12	1157	5	Tunisia	4	71	1
Czech Republic	4	18	5	Zimbabwe	1	25	1
New Zealand	4	206	5	Brazil	2	11	0
Turkey	9	38	5	Croatia	1	11	0
Viet Nam	3	5226	5	Denmark	1	32	0

Belgium	4	416	4	Estonia	1	11	0
Jordan	13	64	4	Hungary	1	13	0
Portugal	6	6	4	Iraq	1	1	0
Thailand	3	1721	4	Japan	1	106	0
Egypt	5	45	3	Latvia	2	1	0
Finland	8	255	3	Lithuania	1	7	0
Hong Kong	4	225	3	Mauritius	1	1	0
Indonesia	11	66	3	Montenegro	1	9	0
South Africa	5	7	3	Nigeria	2	25	0
United Arab Emirates	4	1	3	North Macedonia	3	9	0
India	30	257	2	Poland	2	11	0
Norway	3	28	2	Romania	1	1	0
Palestine	1	141	2	Russian Federation	2	19	0
Sweden	8	0	2	Slovenia	2	22	0
Switzerland	5	39	2	Uganda	1	564	0
Bahrain	3	11	1	Ukraine	1	11	0

3.7 Co-occurrence (author keywords)

Co-occurrence analysis represents the occurrence of items in a particular document. We executed analysis on author keywords. Minimum occurrence threshold was set on 02 which gave us 194 author keywords out of 1071 for analysis. All the items (keywords) were connected so the largest set of these connected items was shown in Figure 9. The most prominent keywords found were hovering around e-services because it was the central theme. The keyword ‘e-services’ had 498 total link strength which occurred 217 times. It was followed by ‘e-service quality’ (Occurrence, 144; TLS, 362), ‘e-commerce services’ (Occurrence, 49; TLS, 141), ‘customer satisfaction’ (Occurrence, 34; TLS, 113), ‘web services’ (Occurrence, 32; TLS, 105) and ‘e-government services’ (Occurrence, 47; TLS, 100).

Results also showed different services (keywords) which were cooccurred with e-services and e-service quality search. The list of these services was mentioned in Table 5. We divided these services in two formats; ones were those which were related to electronic services and others were common services. The electronic services included online services, digital services, and mobile services.

Few electronic services were revealed to have least total link strength (TLS). These would be the interesting avenues for future research directions pertaining to e-services and e-service quality. Online delivery services occurred 02 times with 05 total link strength (TLS), followed by internet services (Occurrence, 02; TLS, 03) and online database services (Occurrence, 02; TLS, 02).

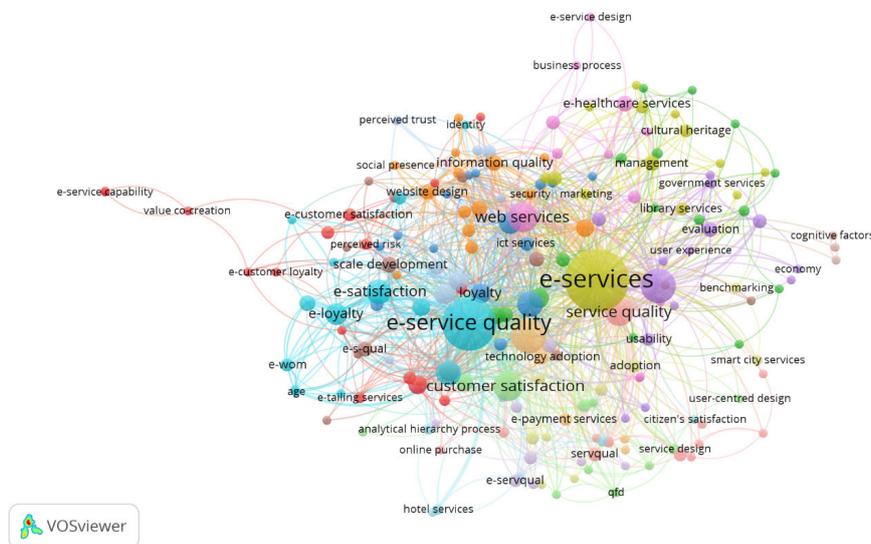


Fig. 9. Co-occurrence of author keywords

Table 5. Categorization of e-services from co-occurrence of author keywords

E-Services			Other Services		
Item (Keyword)	Occurrence	TLS	Item (Keyword)	Occurrence	TLS
e-Commerce Services	49	141	Banking Services	12	44
Web Services	32	105	Tourism Services	6	25
e-Government Services	47	100	Education Services	7	23
e-Banking Services	21	76	Healthcare Services	5	15
e-Retailing Services	12	38	Government Services	3	14
e-Healthcare Services	7	17	Retailing Services	4	14
e-Tourism Services	4	14	Airline Services	2	10
IT Services	4	13	Logistic Services	3	10
ICT Services	5	11	Library Services	4	8
e-Payment Services	4	10	Hotel Services	3	7
e-Tailing Services	3	10	Insurance Services	2	7
e-Communication Services	2	9	Atm Services	2	6
Smart City Services	3	7	Delivery Services	2	6
Online Delivery Services	2	5			
Internet Services	2	3			
Online Database Services	2	2			

3.8 Bibliographic coupling (Documents)

We proceed our analysis to bibliographic coupling of documents. Bibliographic coupling represents the links between publications. It also indicated the number of citations two publications have in common. We ran this tool on documents, there were other options like sources, authors, countries, and organizations.

While executing, we set the minimum number of citations of a document at 00. All the documents (404) met the criteria. The largest set of connected items (documents) was 363 (figure). To make visualization better, attraction value was set at 4 and repulsion at -2. Figure 10 represented the bibliographic coupling of 363 items (documents/publications). It was based on the weight of total link strength. The 100 highest scoring TLS documents or publications were listed in Table 6. Stamenkov & Dika, [13] was cited 6 times and had highest TLS (1909) among others, followed by del Águila-Obra et al., [14] and Poon & Lee, [15] [18].

Figure 11 represented the bibliographic coupling map based on citations. It showed the prominence of Parasuraman et al., [11] with 199 links, 552 TLS and 1941 citations. It was highly cited publication in which authors created the multi-item scale that was e-s-qual for measuring e-service quality.

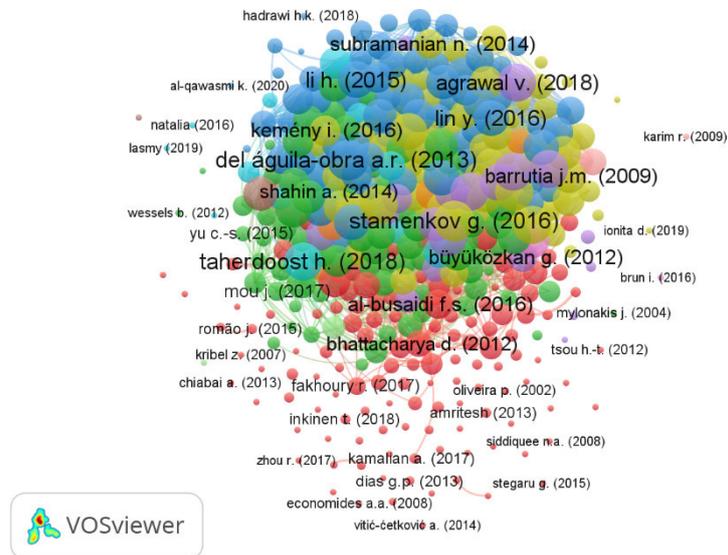


Fig. 10. Screenshot of bibliographic coupling (documents)

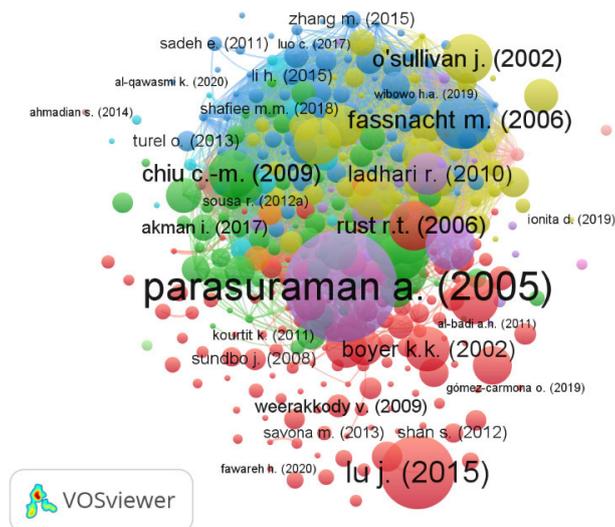


Fig. 11. Screenshot of bibliographic coupling (documents) on citations

Table 6. List of documents from bibliographic coupling as per TLS

Item (document)	Citations	TLS	Item (document)	Citations	TLS
Stamenkov G. (2016) [13]	6	1909	Kemény I. (2016)	13	918
Del Águila-Obra A. R. (2013) [14]	0	1906	Lin C.-H. (2010)	17	914
Poon W.-C. (2012) [15]	6	1640	Du J. (2013)	22	909
Shatnawi T. (2019)	5	1629	Mekovec R. (2007)	11	900
Taherdoost H. (2018)	33	1627	Chiu C.-M. (2009)	243	899
Hussien M.I. (2013)	31	1622	Khatib S.M. (2019)	0	896
Gera R. (2011)	20	1606	Wang W. (2019)	4	893
Agrawal V. (2018)	6	1591	Kumar G. (2017)	11	891
Kaur B. (2020a)	3	1585	Lau T.-C. (2011)	13	881
Shankar A. (2020)	2	1584	Tsang N.K.F. (2010)	65	876
Janita M.S. (2013)	60	1544	Yaya L.H.P. (2011)	63	874
Mouakket S. (2012)	30	1499	Rita P. (2019)	43	869
Hsin Chang H. (2011)	157	1489	Finn A. (2009)	61	869
Ladhari R. (2010)	180	1471	Trabelsi-Zoghalmi A. (2020)	4	867
Li H. (2015)	23	1442	Han B. (2018)	9	847
Bhati N.S. (2020)	0	1339	Hsu S.-H. (2008)	119	845
Al-Tarawneh K.A. (2012)	13	1334	Chang H.H. (2009)	225	827
Ahmad A. (2016)	23	1316	Kumar A. (2015)	10	819
Lin Y. (2016)	29	1314	Büyüközkan G. (2012)	262	809
Mouakket S. (2014)	7	1265	Benaroch M. (2011)	13	807
Park Y.A. (2007)	85	1258	Belanche D. (2014)	79	798
Kim J.-H. (2020a)	2	1190	Jin J. (2020)	0	797
Al-Nasser M. (2015)	10	1171	Al-Busaidi F.S. (2016)	0	797
Al-Dweeri R.M. (2019)	12	1156	Subramanian N. (2014)	59	788
Menezes L.S. (2016)	8	1140	Al-Ammary J. (2017)	4	772
Stamenkov G. (2015) [13]	21	1132	Etemad-Sajadi R. (2015)	29	772
Giovanis A.N. (2014)	19	1129	Hahn S.-E. (2017)	27	769
Fuentes-Blasco M. (2010)	49	1129	Adil M. (2020)	1	765
Rafiq M. (2012)	28	1117	Luo S.-F. (2011)	9	763
Kaya B. (2019)	17	1114	Liao C.-H. (2011)	37	757
Barrutia J.M. (2009)	18	1110	Zhang X. (2006)	35	739
Lee F.-H. (2011)	49	1105	Castro-Lopez A. (2017)	8	730
Xu J.D. (2013)	199	1094	Carlson J. (2011)	30	727
Siu N.Y.-M. (2010)	6	1083	Kim J.-H. (2020b)	0	720
Lee H. (2009)	88	1077	Hsu T.-H. (2012)	30	719
Dai H. (2020)	1	1072	Rahi S. (2019c)	13	717
Udo G.J. (2010)	213	1051	Ahmad S. (2020)	2	716

(Continued)

Table 6. List of documents from bibliographic coupling as per TLS (*continued*)

Item (document)	Citations	TLS	Item (document)	Citations	TLS
Sardana S. (2020)	1	1049	Moez L. (2013)	5	712
Yarimoglu E.K. (2017)	7	1044	Loukis E. (2012)	30	711
Chen Y.-C. (2017)	8	1041	Hung S.-Y. (2013)	28	704
Sousa R. (2012b)	38	1025	Agrawal V. (2019)	1	695
Al-Adwan A.S. (2019)	5	1012	Kurt S.D. (2012)	19	694
Sousa R. (2012a)	7	1012	Rahi S. (2019b)	17	688
Stiglingh M. (2014)	8	1009	Liljander V. (2006)	226	684
Ali H. (2019)	5	987	Rabinovich E. (2008)	21	683
Kao T.-W. (2016)	28	987	Etamad-Sajadi R. (2014)	14	670
O'cass A. (2012)	40	986	Taherdoost H. (2017)	7	668
Rahman M.S. (2020)	4	964	Featherman M.S. (2010)	34	659
Wu Y.-L. (2012)	16	948	Berbegal-Mirabent J. (2016)	23	654
Pearson A. (2012)	40	944	Bhattacharya D. (2012)	69	653

4 Conclusion, limitations and future research directions

This study presented an overview of ‘e-service and e-service quality’ research. It was based on the 404 documents which were retrieved from the Scopus database with the timeline from 2000 to 2020. The field of ‘Business, Management and Accounting’ witnessed the highest number of publications. Total Quality Management and Business Excellence was found at the top among the most productive journals in chosen search. Chang W.-I. and Yuan S.-T. from Taiwan were found to be the leading authors among top ten authors. United States and National Cheng Kung University of Taiwan were found to be the leading country and institution in the selected search of e-service and e-service quality.

Bibliometric mapping results revealed Li H., Lu J., and Nijkamp P. were authors who had highest association between other authors, United States was the leading country which had highest associations, collaborations, and affiliations with other countries in authoring the studies. Furthermore, along with central keywords (e-services and e-service quality), e-commerce services, customer satisfaction, web services and e-government services were the most prominent and highly associated keywords found.

The current study was not free from limitations. The search term was limited to ‘e-services and e-service quality’ only, therefore, it might not cover all the relevant subject of studies. The current study excluded 2021 year which might include interesting topics in the searched area.

Based on the limitations and results, we found that most of the research was done in the field of Business, Management and Accounting, and there was a need to focus on other underexplored areas such as Psychology, Arts and Humanities, Decision Sciences and Engineering. These would be the interesting avenues for future research directions pertaining to e-services and e-service quality. Online delivery services, internet services

and online database services were found least associated with central keywords and further research was suggested in those services.

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6 Appendix 1

6.1 Search String

```
e-services OR e-service AND quality AND ( LIMIT-TO
( EXACTKEYWORD , "E-services" ) OR LIMIT-TO ( EXACT-
KEYWORD , "E-service Quality" ) OR LIMIT-TO ( EXACT-
KEYWORD , "E- Services" ) OR LIMIT-TO ( EXACTKEYWORD ,
"E-service" ) OR LIMIT-TO ( EXACTKEYWORD , "Electronic
Services" ) ) AND ( EXCLUDE ( PUBYEAR , 2021 ) ) AND
( LIMIT-TO ( DOCTYPE , "ar" ) ) AND ( LIMIT-TO ( SRC-
TYPE , "j" ) ) AND ( LIMIT-TO ( LANGUAGE , "English"
) )
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