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Review Article

Bibliometric Analysis and Visualization of Online Consumer Behavior – Past, Present and Future

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Abstract

Understanding online consumers and their buying behavior had been the major focus for marketers and gained special attention among the marketing science researchers for over three decades. The purpose of this research is to investigate the past and current trends in online consumer behavior domain, by highlighting the research themes through bibliometric analysis and provide an agenda for future research. The study carried out a systematic literature review of online consumer behavior research with the help of bibliometric analysis from 1999 to 2020, and the bibliographic data of 1254 documents were obtained from the Scopus, one of the popular academic indexing databases. The study performed various bibliometric analysis using open-source software tools, including Biblioshiny, VOS Viewer, and Sci2 tool. This paper is unique in applying a variety of quantitative and scientific mapping tools for better understanding and visualization of the research field. The analysis of scientific research will be a reference guide for research scholars in the academic community for understanding the intellectual structure, theoretical foundations of online consumer behavior research and identify the knowledge gaps and recommend future research directions. It can also help the marketing practitioners to understand the dynamic characteristics of online consumers and their buying behavior, through various contributions made by the scientific literature.

Keywords: Online consumer behavior, social media, online consumer reviews, co-citation analysis, bibliographic coupling analysis, citation burst analysis.

1. INTRODUCTION

The Internet, as a leading breakthrough technology, had transformed the way individuals and businesses performing their activities throughout the world for over 30 years. The total number of Internet users across the world had increased drastically from a mere 16 million in 1995 to 5.05 billion in 2020 (Internet World Stats, 2021). A report stated that there are 4.66 billion active internet users worldwide, out of which 4.32 billion are active mobile internet users, 4.2 billion are active social media users, and 4.15 are active mobile social media users (We Are Social, Data Reportal, & Hootsuite, 2021). Further, it was found that the internet population and growth rate were varying across the global regions. The growth of Internet users' population from 2009 to 2020 has been: 764.4 million to 2525.03 million in Asia; 425.8 million to 727.85 million in Europe; 259.6 million to 332.91 million in North America; 186.9 million to 467.82 million in Latin America; 86.2 million to 566.14 million in Africa; 58.3 million to 184.86 million in Middle East, and 21.1 million to 28.92 million in Australia (Internetworldstat.com, 2020). The top three countries with the highest number of Internet users are China with 934.38 million, India with 696.77 million, and the USA with 284.09 million (Ibid).

Internet has been providing opportunities for business of all sizes, from small (start-up) to large-scale (Fortune 100) companies (Chen *et al*., 2002). Internet, as an innovative platform, enable business firms to reduce the cost of attracting new customers and to reduce cost per customer order, to develop new product/service offerings much faster, to have personalized, one-to-one, and interactive communication with their prospective and existing

customers, to quickly identify and penetrate new marketplaces, to provide pre- and post-purchase services to their customers at lower cost, thus ensuring customer satisfaction and loyalty. The Internet has become an integral part of corporate strategies in general and marketing strategies in particular. The global marketers have increased their advertising expenditure more on digital platforms like online classifieds, display ads, sponsorships, videos, search, in-game advertising, advertising through newsletter and e-mail, which has been $325.02 billion in 2019 and the same is estimated to reach $526.17 billion by 2024 (eMarketer, 2020).

The Internet users have been performing various actions online such as communication, social networking, banking, bills payment, buying and selling goods and services, reading news, playing games, health-related benefits. According to a report by Capgemini (2020), the top 10 online activities that online users are comfortable with, are: "searching/using Google" (75%), "Accessing mail" (73%), "Shopping online" (68%), "Watching videos/movies" (67%), "Using instant messaging" (64%), "Using social media" (64%), "Banking/making payments" (63%), "Making calls" (54%), "Searching/applying jobs" (54%), and "Learning/training" (54%).

Through Internet, consumers could get a lot of information about the products/services, compare various brands and its prices, buy their favorite products online conveniently from any place and any time (Forsythe & Shi, 2003). According to a report by Wunderman Thompson Commerce (2020), the various sources over the Internet used by consumers for searching product information are "Amazon" (63%), "search engines" (48%), "retailer sites" (33%), "other marketplaces" (25%), "website of the brand they want" (21%), "comparison sites" (10%) and "social media" (8%). The preference for purchasing goods and services online has been growing steadily over the last two decades. The number of digital buyers across the world was 1.32 billion in 2014 and this was estimated to reach 2.14 billion by 2021 (eMarketer, 2017). The top five reasons for global consumers purchasing over the Internet than a brick-and-mortar store are "better prices" (63%), "free and discounted shipping" (47%), "wide range of product categories" (34%), "product reviews" (32%) and "speed of delivery" (32%) (Ups, 2019). The growth rate of retail e-commerce sales has been slowing down worldwide from 28% in 2017, 22.9% in 2018, and 20.2% in 2019 because of recessionary trends across the world, but the same grew to 27.6% in 2020, due to the outbreak of Covid-19 (eMarketer, 2021). Based on the report of Worldpay (2021), 44.5% of total ecommerce transactions worldwide were made through digital or mobile wallets, followed by 22.8% by credit cards and 12.3% by debit cards.

The Internet technologies have had a profound impact on both consumers' decision-making process (information search, comparison and evaluation of products and services and final decision to buy through online/offline channels), and strategies and tactics of marketers. With the emergence of diverse shopping platforms (website, digital and mobile) and increased availability of alternatives, the online consumers have been more demanding, expecting both hedonic and utilitarian benefits, and more empowered than offline consumers (Koufaris 2002). The modern marketers, operating on online platforms, had been designing the innovative means of attracting, communicating, engaging, and satisfying their target market, thus aimed at providing a compelling shopping experience (Novak *et al*., 2000). Online businesses provide distinct benefits by offering a wide variety of products and services, convenience of purchasing anywhere, anytime and pre-purchase search etc. than brick-and-mortar firms despite the buyers' security and privacy concerns of shopping online (Dennis & Sandhu 2002).

Online consumer behavior is a complex socio-technical phenomenon, as there are many interdependent factors shaping such behavior (Lee & Chen 2010). For instance, Kim & Eastin (2011) investigated the influence of hedonic motivation (fun, excitement, and novelty) on online consumers' purchasing behavior. Various factors were found to have a significant impact on online buying behavior, for instance, emotional variables (pleasure and dominance), site atmospherics, and website interfaces (Mazaheri *et al*., 2011); online reviews (Park & Nicolau, 2015). Online trust has been identified to be one of the critical factors for the success of e-commerce firms, as lack of trust might discourage online consumers from buying products online (Chen & Barnes, 2007). The social media has provided consumers with enhanced satisfaction during two stages of buying behavior i.e., information search and alternative evaluation (Voramontri & Klieb 2019).

Sheehan & Hoy (1999) have investigated the significance of privacy concerns of online consumers and its influence on their buying behavior. Sheehan (2002) has studied the privacy concerns of online consumers, and the results found different segments of consumers based on their personality and demographic characteristics. Security and privacy concerns were the major barriers to shopping over the Internet, and convenience offered by the Internet and the 24/7 availability of customer service motivated consumers to shop online (Ahuja *et al*., 2003). Chatterjee *et al*., (2003) has examined the consumers' (exposure) response through modeling their clickstream data. A study by Shang *et al*., (2006) investigated the causes of online consumers' (active and passive) participation in virtual consumer communities and its effect on brand loyalty. Like any other social situations, the online consumer behavior is also being influenced by other

consumers' actions, called as the herd behavior. Chen (2008) has evaluated this, and the results found that the online consumers preferred the recommendations of other consumers than the recommendations offered by the online vendor.

As online consumers are interacting with technological devices, and being influenced by many significant factors in the virtual shopping environment, various research models were developed to measure their distinct behavior, derived from diverse fields such as psychology, sociology, information science, economics, marketing, etc. A theoretical framework was proposed based on the Theory of Planned Behavior (Ajzen, 1991), explaining the effect of flow constructs (concentration, enjoyment, and telepresence) on online consumer behavior, which was moderated by perceived behavioral control and attitude (Lee & Chen, 2010). A study by Mazaheri *et al*., (2011) conceptualized a research framework of online consumer behavior based on two popular theories, viz. Theory of emotions (Zajonc, 1980) and stimulus-organism-response model (Mehrabian & Russell, 1974). The empirical validation of their model revealed that emotional variables (pleasure, arousal, and dominance) had influenced the website atmospheric variables (entertainment, informativeness and effectiveness). Further, the site atmospheric factors were found to have significant impact on site involvement, site attitudes, service attitudes and purchase intentions of online consumers. Another study by Mazaheri *et al*., (2014), explained the importance of three dimensions of service tangibility viz. physical intangibility, generality and mental intangibility and their impact on consumers' attitudes towards the online websites. This study highlighted the differences in the behavior of online consumers across the three cultural contexts. A longitudinal study conducted by Kim (2012), explained the pre-purchase (trust and expectation) and post-purchase (satisfaction, post expectation and post-purchase intention) stages of consumer behavior in the ecommerce context. The framework of this was developed based on three theories viz. social exchange theory (Homans, 1974), expectation-confirmation theory (Oliver, 1980) and post-adoption model (Bhattacherjee, 2001). Zhang *et al*., (2006) studied the effect of impulsiveness on consumers' intention to buy, and they empirically validated a research model, which is a modified version of Technology Acceptance Model (Davis, 1989). Van Noort *et al*., (2008) tested the impact of online safety cues on consumers' risk perceptions, their attitudes, and intentions to buy online, by applying Regulatory Focus Theory (Higgins, 1997). Saeed *et al*., (2003) introduced an integrated framework of online consumer behavior research based on the extensive review of literature. The comprehensive model encompasses the influence of significant factors (system quality, information quality, service quality and vendor and channel features) on specific behavior i.e., usage of web, online purchase, and post-purchase, which was mediated by consumers' perceptions such as ease of use, usefulness, trust, and shopping enjoyment. Constantinides, E. (2004) delineated the differences between the purchase decision-making process of offline consumers and virtual consumers, by highlighting the importance of variables which are unique to the online platform and the need to modify the conventional marketing elements.

Hwang & Jeong (2016) identified two major research themes (website use and purchase behavior) through a review of online purchase behavior research, considering few top information systems and e-commerce sources of publications. Bauman & Bachmann (2017) reviewed the online trust in e-commerce literature published between 2004 to 2014. Nguyen *et al*., (2018) systematically reviewed online retailing literature, focusing specifically on online fulfillment activities, based on the findings from 52 peer reviewed research papers from 2000 to 2015. This study identified the significant order-fulfillment elements from the perspective of online consumers' buying behavior. A study by Vanhala *et al*., (2020) applied bibliometric analysis and text-analytic methods in usage of large data sets in online consumer behavior literature and identified related research themes. Reyes-Menendez *et al*., (2020) conducted another bibliometric analysis of online consumer behavior in tourism sector by highlighting the significance of electronic word-of-mouth strategies.

From the above paragraphs, it is evident that the Internet has become a critical platform for consumers to search, compare, evaluate, and purchase their preferred choice of products online. Understanding online consumers and their buying behavior had been the major focus for marketers and gained special attention among the information systems and marketing science researchers in the last three decades, because of the rapid growth of e-business worldwide (Lee & Chen, 2010). However, there are limited studies available explaining the evolution of various research themes in online consumer behavior and their advancement over the period. Therefore, it is necessary to have a clear picture of the existed research themes, the current trends, and the potential areas of research on online consumer behavior.

This article aims to fill this gap by evaluating the past and current trends in online consumer behavior domain, by highlighting the research themes through bibliometric analysis and provide agenda for future research. The objective of this study is to carry out a systematic literature review of online consumer behavior research with the help of bibliometric analysis for the period of 22 years, i.e., from 1999 to 2020. The study is first of its kind and unique in adopting and applying a large variety of quantitative tools (bibliometric techniques) in online consumer behavior

research, to identify the evolution of various knowledge themes and trends.

2. METHODOLOGY

This paper used comprehensive bibliometric analysis tools to examine the intellectual structure of the online consumer behavior literature. Bibliometric analysis can be defined as the application of quantitative methods to analyze contents and other bibliometric data of various publications, such as peer-reviewed journal articles, books, book chapters, conference proceedings, periodicals, reviews, reports, and other documents. This review adopted both the procedures of bibliometric analysis i.e., performance analysis and scientific mapping, as suggested by Cobo *et al*., (2011). The performance analysis aims to measure the productivity and impact of scientific publications in terms of authors, universities, and countries. The structural and dynamic patterns of scientific research can be understood with the help of scientific mapping analysis.

To fulfill the study's objectives, the bibliographic data of documents were obtained from the Scopus by Elsevier, which is one of the popular academic indexing databases. Data were extracted in January 2021. All types of documents available in the Scopus were used for analysis to provide a comprehensive review of the selected research area. The publications available only in English language were considered, which resulted in a total 1254 documents. The search terms used to retrieve the documents were "online consumer" OR "e-consumer" OR "virtual consumer" OR "digital consumer" AND "behavior" OR "behavior" in the field of 'Article title, Abstract, Keywords'. These documents were covering the period of 22 years, i.e., 1999 to 2020. To perform quantitative analysis and visualization of online consumer behavior research, bibliographic data of the publications were extracted like authors, source, keywords, references, abstract, total citations, etc.

The performance analysis and scientific mapping has been performed with the help of the following quantitative methods: content analysis; citation analysis; co-occurrence analysis; co-citation analysis; bibliographic coupling analysis; and Citation Burst analysis. To perform various quantitative analyses, the study used different open-source bibliometric software packages – Biblioshiny (Aria & Cuccurullo, 2017), VOS Viewer (www.vosviewer.com; Van Eck & Waltman, 2010), and Science of Science-Sci2 tool (Sci2 Team, 2009).

3. RESULTS AND DISCUSSION

The initial frequency distribution and citation analysis of documents are performed using Biblioshiny software. Table 1. provides the information about the publications extracted from the Scopus database, with 1254 documents published between 1999 and 2020 (January 2021). The usage of Internet in the late 1990's, was primarily for searching products/services information, comparing their prices, and purchasing them offline/online. This trend was growing faster in developed countries (for example the USA), which was still at a nascent stage among the major parts of the world (especially Asia-Pacific and Africa). Between 1995 and 2000, the e-commerce firms grew exponentially in developed nations (specifically the USA), due to the immense growth of Internet users. The major reasons attributed to this development were based on the unique features of Internet as a new business platform, namely ubiquity, global reach, interactivity, information density and personalization or customization (Laudon and Laudon, 2011). Thus, as a reflection of Industry Trends, the publications in the area of online consumer behavior had started since 1999, which would be considered as the beginning era of research in this field.

There were about 640 sources where these documents were published, which include journals, books, conference proceedings, conference review etc. The keywords provided by authors were more than double the number of documents, with a total of 3080. Those documents were written by 2682 authors, in which 169 documents were single-authored documents and the remaining (2513) were multi-authored documents. The average number of co-authors for every document has been 2.69 with a collaboration index of 2.44. The average citations per document is given as 27.21, which is relatively high, signifying the popularity of the research on online consumer behavior.

Table 1: Main information about the publications

Total number of documents	1254
Timespan	1999:2020
Types of Sources (Journals, Books, etc)	640
Average years from publication	7.26
Average citations per document	27.21
Average citations per year per doc	2.645
References	52884
DOCUMENT CONTENTS	
Keywords Plus (ID)	3425
Author's Keywords (DE)	3080

AUTHORS	
Authors	2682
Author Appearances	3370
Authors of single-authored documents	169
Authors of multi-authored documents	2513
AUTHORS COLLABORATION	
Single-authored documents	226
Documents per Author	0.468
Authors per Document	2.14
Co-Authors per Documents	2.69
Collaboration Index	2.44

The extraction of publications on online consumer behavior for the period of 22 years i.e., 1999-2020, resulted in 1254 documents in 640 sources (journals, conference paper, book chapter, review etc.). As given in Fig-1, the majority (800) were research articles in various journals, followed by 300 conference papers, 50 review papers, 43 book chapters and 34 conference review papers (Figure-1). The reason for articles published in the journals are being dominant is because of the research field i.e., online consumer behavior had been evolving in the last two decades, and there were many theoretical models developed and applied in studying the dynamic nature of online consumer behavior. A total of 800 articles were published in as many as 160 journals across various disciplines. Out of these, only 11 journals had published 10 or more articles and 20 journals published at least 5 articles during 1999- 2020. The top 20 journals with most publications were falling into marketing and information system areas. As journal articles are scholarly and peer-reviewed and make significant contributions in theory development and knowledge management of a specific field.

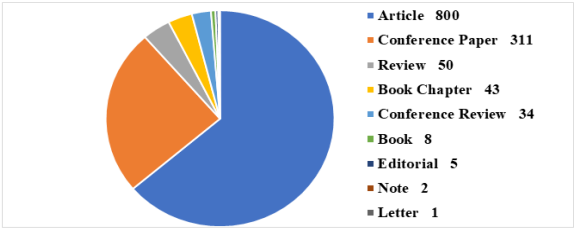

Fig-1: Document types on online consumer behavior research

There were more than 25 subject categories covering publications in online consumer behavior, the top 10 categories are listed in Table 2. The highest number of publications were associated with the category of 'Business, Management and Accounting' with 623 (49.68%) documents, followed by 'Computer Science' with 533 documents, 'Social Sciences" with 270 documents, 'Economics, Econometrics and Finance' with 148 documents and both 'Decision Sciences' and 'Engineering' with 142 documents. It was anticipated that most of the publications would fall in to two major subject categories viz. 'business, management and accounting' and 'computer science'. The obvious reason, as noted earlier, has been the distinct characteristics of online consumer behavior, impersonal interactions with technological channels, tends to be different than offline consumers and this field is also multidisciplinary in nature, theories derived from business, marketing, psychology, sociology, and information systems. Similarly, the subject areas such as 'social sciences', 'economics, econometrics, and finance', 'decision sciences', and 'engineering' are interconnected and are also closed associated with the field of online consumer behavior. It is interesting to note the mathematics as one of the top contributing subject areas, because of various quantitative tools and techniques applied in this field. The impact of technological developments (specifically Internet) on health care resulted in drastic changes in the way services are provided to modern consumers, hence, there exists a reason for 'medicine' being one of the top contributing subject areas.

Table 2: The top 10 subject categories on online consumer behavior research

Subject Category	**Publication Number**	**Percentage of Total**
Business, Management and Accounting	623	49.68%
Computer Science	533	42.50%
Social Sciences	270	21.53%
Economics, Econometrics and Finance	148	11.80%
Decision Sciences	142	11.32%
Engineering	142	11.32%
Mathematics	83	6.62%
Psychology	79	6.30%
Medicine	51	4.07%
Arts and Humanities	47	3.75%

The annual publication trend of online consumer behavior research during 1999 – 2020 is provided in Fig-2. It is evident that the number of publications had been growing slowly till 2008, then this had increased steadily for the next five years from 2009 to 2013. This can be explained partly because of the rapid developments in Information and Communication Technologies, resulted in almost doubling the Internet users across the globe i.e., from 1.574 billion in 2008 to 2.802 billion in 2013 (ITU, 2020). Another reason could be the swift diffusion of smartphones around the world, led to surge in smartphone user penetration from 9.7% in 2010 to 31% in 2013 (eMarketer, 2012). The activities performed by online consumers had been expanding from mere communication, browsing information etc. to spending more time on entertainment (videos, games), shopping, networking etc. Subsequently, the publications had been rising rapidly between 2016 and 2020. One of the breakthrough features of online platform that brought a significant change in online consumer behavior during 2010 to 2020 demanding more research, is the evolution of social networking sites. For instance, the number of social network users worldwide has increased more than three times from 970 million in 2010 to 3.81 billion in 2020 (Brian Dean, 2020). Similarly, the average daily time spent by Internet users on social networking sites had gone up to 145 minutes in 2020 from 90 minutes in 2012 (Statista, 2021). According to a report by PricewaterhouseCoopers (2016), the digital shopping behavior of global digital buyers had been influenced by the following social media activities: "reading reviews, comments and feedback"(45%), "receiving promotional offerings" (44%), viewing ads" (30%), "staying on top of current fashion and product trends" (25%), "writing reviews, comments and feedback" (22%), "associating with particular brands or retailers" (20%), and "purchasing products directly via a social media channel" (16%). A market report by GlobalWebIndex (2019) revealed that 43% of Internet users used social networks for searching information about the products, 25% of them have found brands through recommendations or comments on social networking sites, 22% are motivated to buy any product based on a lot of likes and positive comments on social media. Further, it was found that only 12% of online users are motivated to purchase because of a 'buy' button on social networking sites.

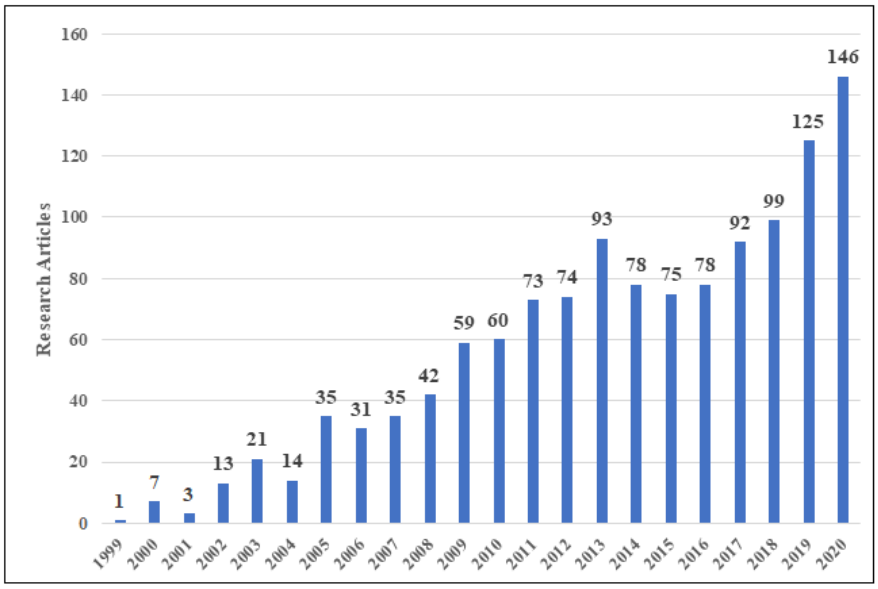

Fig-2: Evolution of literature in online consumer behavior research

The influence of published documents from 1999 to 2020 has been illustrated in Fig-3, in terms of average citations per year. It is observed that the average number of citations had reached the peak during the years 2000 and 2002. In 2000, the average citations per year is higher due to one highly cited article i.e., Novak *et al*., (2000). Similarly, the peak in 2002 has been the result of another article by Koufaris (2002), which has received highest number of citations in this dataset. Further, an article by Pavlou & Fygenson (2006) has been one of the most frequently cited documents, resulting in the increasing trend of average citations per year. Incidentally, these articles are found to be the top three most cited documents in this study.

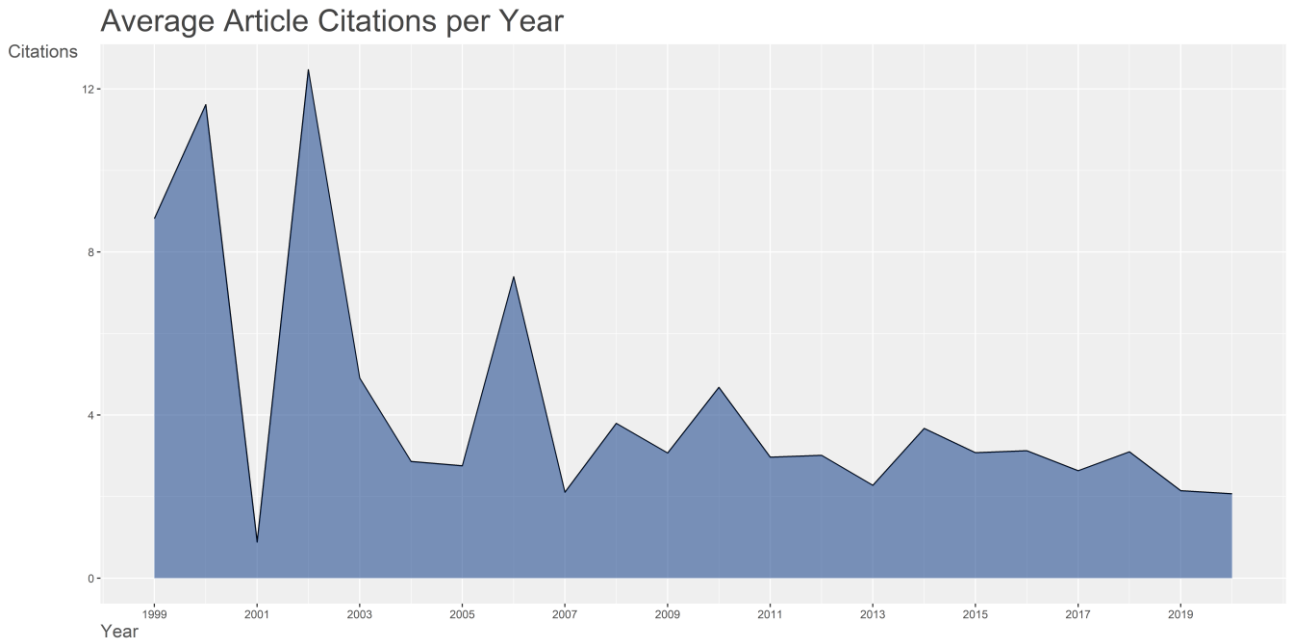

Fig-3: Average article citations per year

In general, 76 countries produced various publications in online consumer behavior research area. Table 3 lists the top 10 most productive countries in terms of research in online consumer behavior between 1999 and 2020. The USA, with 372 documents (29.37%), is the most productive country, followed by China with 162 documents (12.92%) and UK with 115 documents (9.17%). Other countries that have made significant contributions are India with 75 documents (5.98%), Taiwan with 73 documents (5.82%), Australia – 56 documents (4.47%), South Korea – 50 documents (3.99%), Canada with 47 documents (3.75%), Germany with 44 documents (3.51%) and Hong Kong with 43 documents (3.43%). In terms of average citations per document, Hong Kong ranks the first, followed by the USA, Canada, Taiwan, and South Korea.

As the world's leading country with economic, military, and technological power, it is obvious that USA is the most productive country in online consumer behavior research area, with the highest citations and h-index of 18726 and 61, respectively. The number of Internet users in the USA has increased by 328% over a period of 20 years i.e., from 95.3 million in 2000 to 313.3 million in 2020 (Internet World Stats, 2019). Interestingly, the Internet usage penetration among the young (18-29 years) population in the USA was almost 100% in 2019, which was about 72% in 2000 (Pew Research Center, 2020). Surprisingly, this figure was only about 14% for age group of 65+ in 2000, which has grown up to 73% in 2019, and 61% to 97% for 30 to 49 years and 46% to 88% for 50 to 64 years of age (Ibid.). Most of Internet users in the USA are from suburban (94%), followed by 91% from Urban and 85% from Rural (ibid.). According to eMarketer's report (2019), the majority (90%) of Internet users in the USA were e-mail users, followed by search users (85%), digital video viewers (83%), digital audio listeners (72%), and social network users (72%). As the leading economy with advanced technology and infrastructure available, the Internet usage in the USA had been highly penetrated, gained more attention among the academic researchers and making it the most productive country in the field of online consumer behavior.

China, the world's second largest economy in terms of GDP and the most populous country in the world, has been the second most productive country in online consumer behavior. As the country with largest Internet population, the number of Internet users in China had more than tripled from 298 million in 2008 to 989 million in 2020 (CNNIC, 2020). The penetration rate of Internet users in China had grown to 70.4% in 2020 from 22.6 % in 2008 (Ibid.). The Internet users in urban and rural regions in China were 68.7% and 31.3% respectively by the end of 2020 (Ibid.). Among the Internet users, the majority (39.3 %) were in the age group of 30 to 49 years, followed by 26.3% for 50 and above age, and 17.8% for 20 to 29 years of age (Ibid.). The top five activities performed by Internet users in China has been given as follows: 'Instant messaging' (99.2%), 'Online video' (93.7%), 'Short videos' (88.3%), 'Online payment' (86.4%), and 'Search engines' (77.8%). The average time spent by Internet users on online has increased from 18.7 hours in 2011 to 26.2 hours in 2020 (Ibid).

One of the leading economies of the world, the UK, has been identified as the third most productive country in terms of publications in online consumer behavior. The Internet usage population had grown from 15.4 million in 2000 to 63.5 million in 2020 (Internet World Stats, 2019). According to statistics by ITU (2021), only 26.82% of the population were using

the Internet in the year 2000, which grew to 94.82% by 2020. In the UK, as one of the highly penetrated Internet markets, the users had been spending average of 25 hours per week online in 2019, as compared to only 9.9 hours in a week during 2005 (Ofcom, 2020). It is interesting to note that the Internet penetration for both age groups of 15-24 and 25-34 was found to be very high (98.5%), and for age groups of 35-44, 45-54, and 55-64 had been about 96.5%, 97%, and 91.5% respectively, except for the users above 65 years with 66.5%. As per the statistics given by Office for National Statistics (UK) in 2020, the top 5 activities performed by the Internet users are "sending/receiving mails" (85%,), "finding information about goods or services" (81%), "Internet banking" (76%), "Using Instant messaging services (e.g., Skype or WhatsApp)" (71%), and "Social networking (e.g., Facebook or Twitter)" (70%).

Table 3: The top 10 most productive countries/regions on online consumer behavior research

Country/Region	Publication Number	Total Citations	Average Citations	The Percentage of Total	H-index
USA	372	18726	50.34	29.67%	61
China	162	1434	8.85	12.92%	18
UK	115	2787	24.23	9.17%	27
India	75	280	3.73	5.98%	10
Taiwan	73	2250	30.82	5.82%	23
Australia	56	1353	24.16	4.47%	21
South Korea	50	1519	30.38	3.99%	20
Canada	47	1870	39.79	3.75%	18
Germany	44	1082	24.59	3.51%	13
Hong Kong	43	2921	67.93	3.43%	21

From the Table 3, it is evident that among the top 10 most productive countries, two countries are from North America and five countries are from Asia, implying that both regions made the largest contribution of publications in the field of online consumer behavior. In terms of average citations and h-index, the radar map of top 10 productive countries/regions has been illustrated in Fig-4, and it is clear that the USA, UK, Taiwan, Hong Kong and Australia are the most prominent countries.

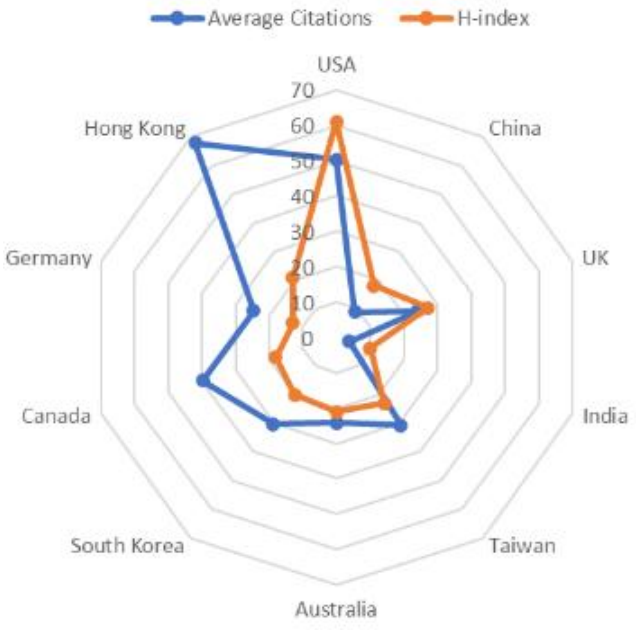

Fig-4: Radar map of top10 countries

In terms of institutions (Table-4), the City University of Hong Kong from Hong Kong has contributed the highest number of publications (18), followed by the University of Texas at Austin from USA (14), National University of Singapore from Singapore (14), Hong Kong Baptist University (12), and University of North Texas form USA (12). In the top 10 productive institutions, five institutions are from the USA, three institutions are from Hong Kong, and one institution is from Singapore, and Canada, respectively.

Table 4: The top 10 most productive institutions on online consumer behavior research

Institution	Publication Number	Total Citations	Average Citations	The Percentage of Total	H-index
City University of Hong Kong	18	1719	95.50	1.44	10
The University of Texas at Austin	14	362	25.86	1.12	7
National University of Singapore	14	411	29.36	1.12	7
Hong Kong Baptist University	12	1631	135.92	0.96	8
University of North Texas	12	503	41.92	0.96	8
HEC Montreal	11	150	13.64	0.88	6
University of South Carolina	10	313	31.30	0.80	7
Hong Kong Polytechnic University	10	589	58.90	0.80	6
Purdue University	10	144	14.40	0.80	6
University of Nevada, Las Vegas	10	378	37.80	0.80	6

In terms of average citations and h-index, the radar map of top 10 productive institutions is depicted in Fig-5, and the most prominent institutions were City University of Hong Kong, Hong Kong Baptist University and University of North Texas and Hong Kong Polytechnic University.

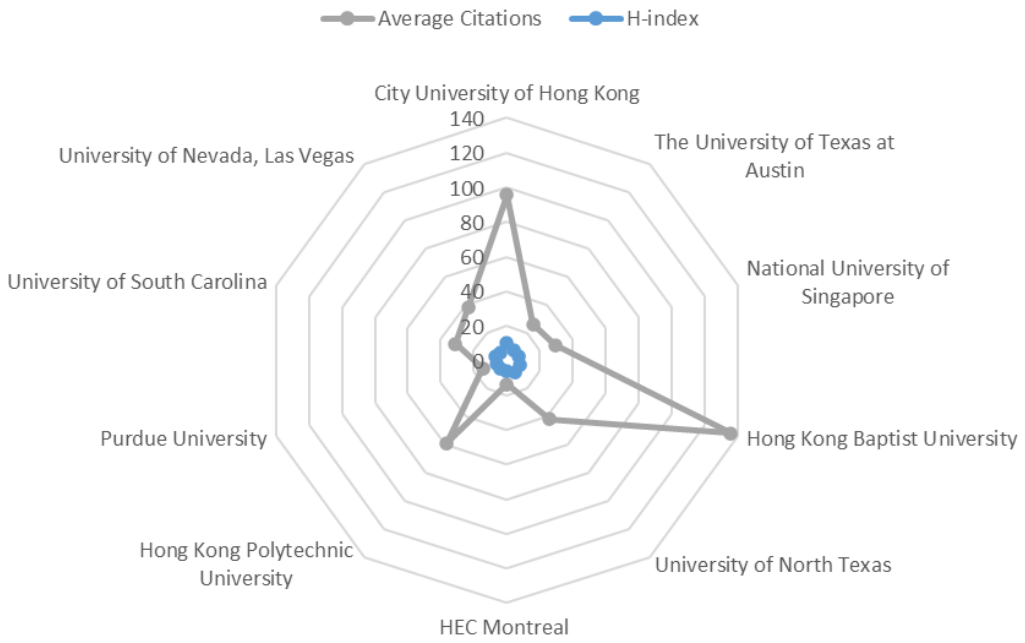

Fig-5: Radar map of top 10 institutions

The top 10 most productive sources of publications are illustrated in Fig. 6. In this study's dataset, there were a total of 1254 documents appeared in 640 sources. Journal of Research in Interactive Marketing is the most productive journal with 33 articles. The next most productive source is Journal of Retailing and Consumer Services (26 articles), followed by Journal of Business Research (19 articles), ACM International Conference Proceeding Series (19 articles), Lecture Notes in Computer Science (18 articles), Sustainability (17 articles), Internet Research (15 articles), Decision Support Systems (14 articles), European Journal of Marketing (13 articles), Electronic Commerce Research and Applications (12 articles). Among the top 10 sources, there are three journals published by the Emerald Group Publishing Ltd., and four journals published by Elsevier, both are amongst the leading academic publishing companies in the world.

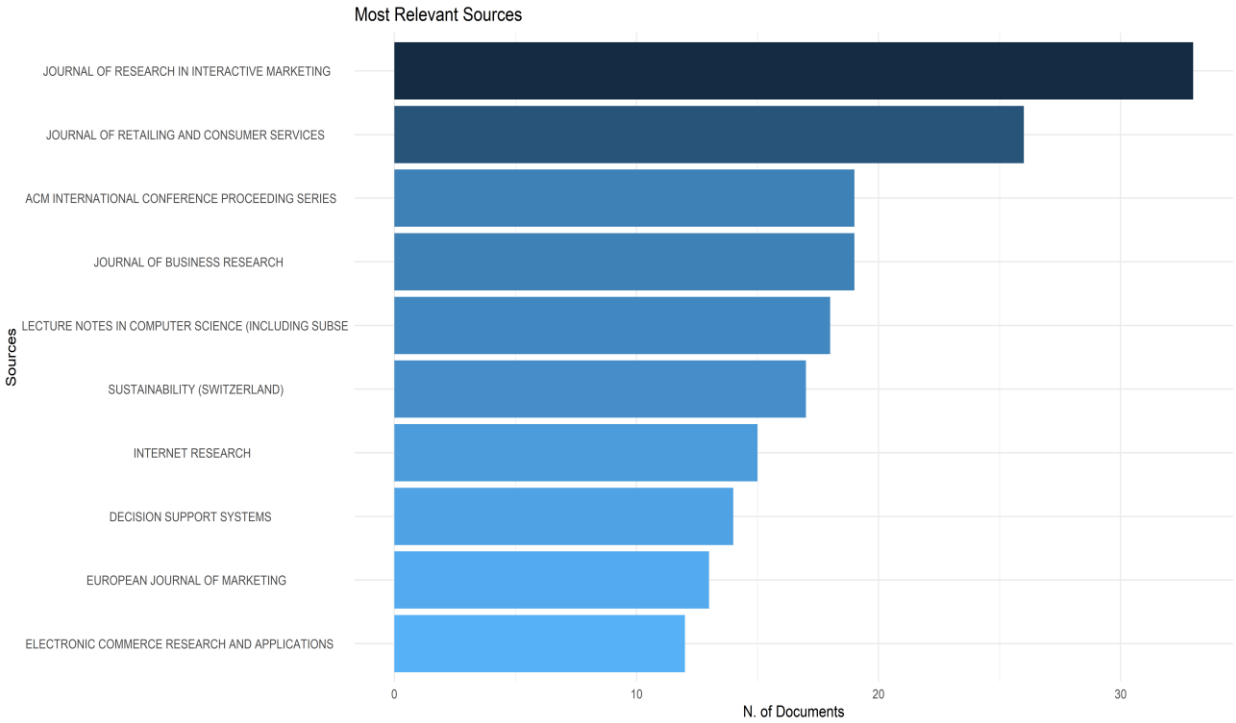

Fig-6: Top 10 productive sources

Further, as given in Fig 7, the "Journal of Research in Interactive Marketing" had been attracting a greater number of publications since 2005 and showing increasing trend in online consumer behavior publications in the future. This journal is published by Emerald, dedicated to focus on various marketing areas such as interactive, electronic, relationship, direct and multi-channel marketing. Similarly, another popular journal in marketing arena, which received highest number of articles from 2006 with increasing trend in the future, is the "Journal of Retailing and Consumer Services". This is followed by another multi-disciplinary journal "Sustainability" which had also shown an increasing trend in publications since 2015.

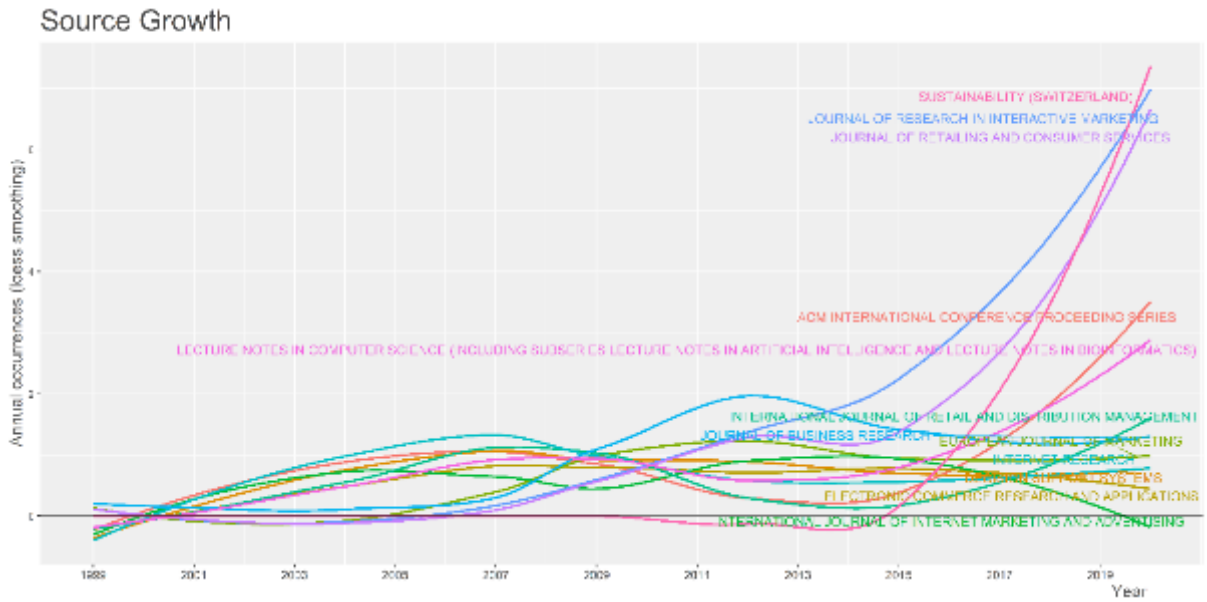

Fig-7: Source growth

A total 2682 authors made contributions in the field of online consumer behavior research. The top ten most productive authors with their number of publications are listed in Table-5. It is clear that Cheung, C.M.K (Cheung *et al*., 2005, 2009; Cheung *et al*., 2008; Cheung *et al*., 2009; Cheung, & Lee 2011; Cheung & Lee 2012; Zhang *et al*., 2014; Zhang *et al*., 2014) is the most productive author in terms of

publications in online consumer behavior, followed by Dennis, C (Dennis *et al*., 2002; Jayawardhena *et al*., 2007; Dennis *et al*., 2009; Bukhari *et al*., 2012; Bukhari *et al*., 2013; Pantano *et al*., 2019; Vazquez *et al*., 2020), Richard M, -O (Richard *et al*., 2010; Mazaheri *et al*., 2011, 2012; Mazaheri *et al*., 2014; Richard & Chebat 2016; Richard & Habibi 2016), Constantinides, E (Constantinides 2004; Lorenzo *et al*., 2007; Constantinides *et al*., 2008; Constantinides *et al*., 2010; Lorenzo-Romero *et al*., 2013; Constantinides & Holleschovsky 2016).

Table 5: The top 10 most productive authors on online consumer behavior research

Author	Institution	Country	Publication Number	Total Citations	H-index
Cheung, C.M.K.	Hong Kong Baptist University	Hong Kong	8	1445	6
Dennis, C.	Middlesex University	UK	7	297	6
Richard, M.O.	SUNY Polytechnic Institute	USA	6	388	6
Constantinides, E.	University of Twente	Netherlands	6	357	5
Mäntymäki, M.	University of Turku	Finland	6	59	2
Wang, H.	Shandong University of Finance and Economics	China	6	5	1
Novak, T. P.	GW School of Business	USA	5	2898	5
Lee, M. K. O.	Sungkyunkwan University	South Korea	5	1303	5
Huseynov, F.	Gebze Teknik Üniversitesi	Turkey	5	44	4
Kim, S. S.	Wisconsin School of Business	USA	5	398	4

The top 10 most cited research papers in online consumer behavior research are depicted in Fig-8 and Table 6. An article by Koufaris (2002) has highest (1696) citations, which demonstrated the distinct features of online consumer behavior, with a special focus on new customers' intentions to return and unplanned purchases and how this behavior was influenced by cognitive and emotional beliefs of online shopping experience. Another highly cited article was by Novak *et al*., (2000) conceptualized a theoretical model explaining the effect of flow on customer experience on the web. Through empirically validating the model, this study also found that customers' ease at placing orders, ease of contacting e-commerce firms, ease of cancelling orders, ease of making payments, ease of returning orders, quicker delivery and prompt customer support are key factors in providing the compelling online experience. Similarly, an article with high citations, by Pavlou & Fygenson (2006) focused on the two interrelated aspects of online consumer behavior i.e., obtaining information and actual purchase. They developed a comprehensive research framework by incorporating TAM and other technological characteristics into TPB and confirmed the hypothesized relationships to capture the two unified behavior of online consumers.

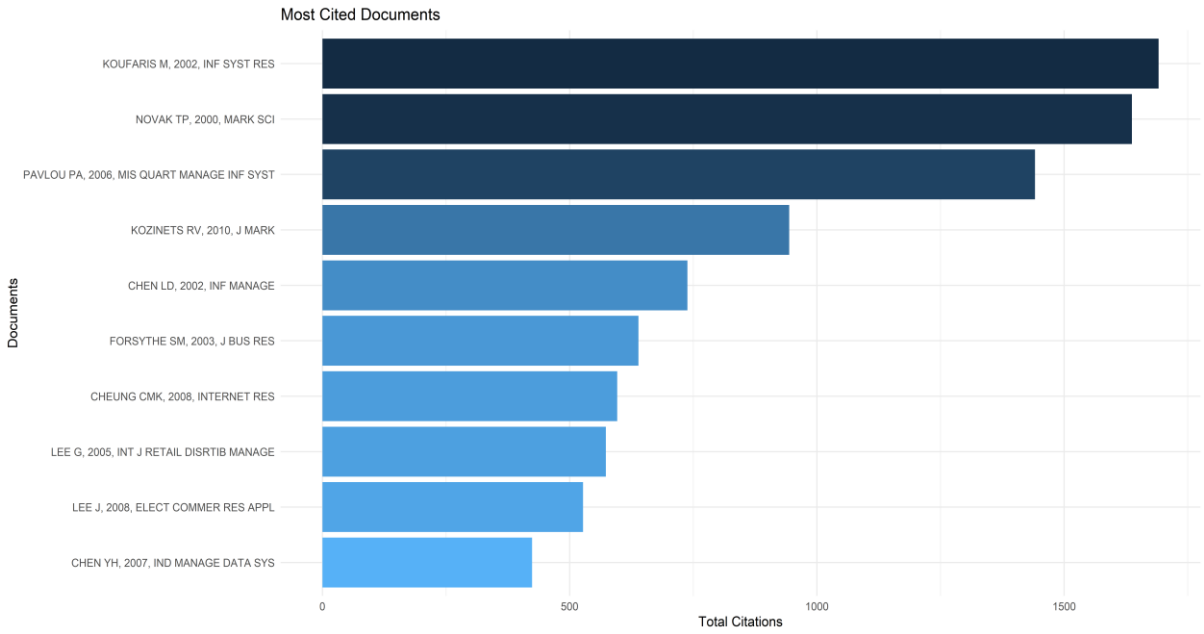

Fig-8: Most cited papers

The influence of word-of-mouth (WOM) marketing on consumer purchase behavior had been demonstrated, in one of the highly cited articles, by Kozinets *et al*., (2010). They suggested the four social media communication strategies viz. "evaluation", "embracing", "endorsement" and "explanation", which were further reinforced by specific factors namely, "character narrative", "communications forum", "communal norms" and "promotional characteristics" (Ibid.). An integration of TAM and Innovation and Diffusion Theory (IDT), explaining the consumer acceptance of virtual stores, was proposed by Chen *et al*., (2002), which had 737 citations till 2020. The results of this study revealed that perceived usefulness, perceived ease of use, and compatibility were the significant factors influencing the consumers' attitude towards using the online store. Consumers' actual usage of online shopping store had been predicted based on their intention and which in turn, was influenced by their attitude. Similarly, another study by Forsythe & Shi (2003) substantiated the role of perceived risk and demographics in determining the Internet patronage behavior of online consumers.

Table 6: The top 10 most cited online consumer behavior publications

Rank	Author(s)	Title	Year	Source	Total citations
1	Koufaris, M.	Applying the Technology Acceptance Model and flow theory to online Consumer Behavior	2002	Information Systems Research	1696
2	Novak *et al*.,	Measuring the customer experience in online environments: A structural modeling approach	2000	Marketing Science	1642
3	Pavlou & Fygenson	Understanding and predicting electronic commerce adoption: An extension of the theory of planned behavior	2006	MIS Quarterly: Management Information Systems	1449
4	Kozinets *et al*.,	Networked narratives: Understanding word-of-mouth marketing in online communities	2010	Journal of Marketing	949
5	Chen *et al*.,	Enticing online consumers: An extended technology acceptance perspective	2002	Information and Management	737
6	Forsythe & Shi	Consumer patronage and risk perceptions in Internet shopping	2003	Journal of Business Research	643
7	Cheung *et al*.,	The impact of electronic word-of-mouth: The adoption of online opinions in online customer communities	2008	Internet Research	599
8	Lee & Lin	Customer perceptions of e-service quality in online shopping	2005	International Journal of Retail and Distribution Management	574
9	Lee *et al*.,	The effect of negative online consumer reviews on product attitude: An information processing view	2008	Electronic Commerce Research and Applications	529
10	Chen & Barnes	Initial trust and online buyer behaviour	2007	Industrial Management and Data Systems	427

Cheung *et al*., (2008) adopted the Information Adoption Model (Sussman & Siegal, 2003) to explain the various level of information adoption among the online consumer communities. It was reported that relevant and comprehensiveness, as part of argument quality factor had positive effect on the information usefulness, which in turn leads to information adoption behavior. An extension of SERVQUAL model was proposed and validated by Lee & Lin (2005), explaining the impact of e-service quality dimensions on online consumers' overall service quality, their level of satisfaction and purchase intentions. This study found that customers' perceived level of trust was the most significant factor influencing both overall service quality and satisfaction, followed by reliability and responsiveness. Further, online customers' purchase intentions were positively influenced by both overall service quality of online stores and customer satisfaction. A study by Lee *et al*., (2008) highlighted that consumers' attitude towards products in online store had been influenced by the varying effects of negative online consumer reviews, through the Elaboration Likelihood Model. The customers' trust on e-commerce stores was identified to be a significant predictor of their intentions to purchase, as online transactions are of more anonymous and impersonal in nature (Chen & Barnes 2007).

The list of top 10 keywords used by authors has been listed in Table-7. The table shows that the keywords 'online consumer behavior', 'e-Commerce'

and 'consumer behavior' are the most frequently appearing keywords in the literature.

Table 7: Top 10 author keywords

Author Keywords (top 10)	Articles
Online consumer behavior	198
e-Commerce	194
Consumer behavior	155
Online shopping	86
Internet	56
Trust	52
Social media	42
Online consumer review	33
Internet marketing	29
Online review	28

The integration of information and communication technologies into various activities, especially in marketing and sales, had provided greater opportunities for businesses across the world, through generating increased sales at reduced costs per order (Saibaba 2021). During the late 1990's, the consumers in developed countries had the privilege to place orders conveniently from their home or work computers, popularized as electronic commerce or e-Commerce. According to Turban *et al*. (1999), electronic commerce is "where business transactions take place via telecommunications networks, especially the Internet". The diffusion of e-Commerce has been rapidly growing for over 30 years and its implications necessitating the need for understanding the distinct characteristics of online consumer behavior. Initially, e-commerce has been confined to wired computer networks of individuals, businesses, governments, and other organizations and this has further expanded into wireless mobile devices (laptops, tablets, smartphones) in the last two decades, called as mobile commerce or m-commerce. According to eMarketer (2021), the worldwide retail ecommerce sales stood at $4.28 trillion in 2020 and this was estimated to be 20.4% of the total worldwide retail sales. This trend has been gradually shifting towards shopping over the mobile devices. For instance, the total worldwide mobile commerce sales were estimated to reach $3.56 trillion in 2021, and this could approximately be 73% of total e-commerce sales (eMarketer, 2018).

One of the most frequently used authors' keywords, is trust i.e., the degree of consumers' reliability and dependance on brands in the online context. According to Mayor *et al*. (1995), trust is "the willingness of a party to be vulnerable to the action of another party based on the expectation that the other will perform a particular action important to the trustor, irrespective to the ability to monitor or control that other party". Corritore *et al*., (2003) define online trust as "an attitude of confident expectation in an online situation of risk that one's vulnerabilities will not be exploited". Consumers' online trust has been widely studied in the literature and considered as the key factor influencing their pre- and post-purchase behavior. With the emergence of social media, the trust has become much more a complex phenomenon because of the influence of digital content, digital media, user generated content, online communities, online consumer reviews, word-of-mouth etc. According to eMarketer (2019), the top three factors that would increase the digital shoppers' trust in brands were 'good online reputation', 'positive customer reviews' and 'quick customer service'. Further, the report stated that the digital customers' trust would be decreased in case of 'deletion of negative comments or reviews of customers', 'negative customer reviews' and 'unsecured website url'.

Online consumer reviews, another significant author's keyword, that has become the important source of information for online consumers, which would influence their buying behavior (Baek *et al*., 2012). Earlier, the level of uncertainty in online context was high, because of various reasons such as limited product information, absence of both actual product displays and salespeople interaction, lack of prior experience or knowledge about the seller etc. It was widely accepted that online reviews would help consumers in reducing their uncertainty, thus positively impacts their purchasing decisions. At the same time, online reviews might also have negative effect on consumers' buying behavior, because of credibility issues, only positive reviews, and conflicting reviews. During the information processing stage of consumers' online buying behavior, online reviews exercise a greater influence, with a clear perception of its benefits and costs. It is reported that 93.4% of digital shoppers worldwide stated to read customer reviews when they research about the unfamiliar online retailer, before making a purchase decision (eMarketer, 2019). It has been found that electronic word-of-mouth has significant influence on online consumer's purchase intentions (Roy *et al*., 2019).

The wordcloud of top 50 author keywords in online consumer behavior research area has been depicted in figure 9. The keywords that are directly related to the theme of this research such as online shopping, internet, social media, internet marketing and online review. Some of the distinct keywords mentioned by the authors include purchase intention, technology acceptance model, perceived risk, word-of-mouth, social commerce, and clickstream data. As discussed in the previous paragraphs, these keywords highlighted the distinct and dynamic nature of online consumer behavior.

Fig 9: Worldcloud of top 50 author keywords

The co-occurrence of authors' keywords has been illustrated in Fig. 10. The keyword network analysis resulted in four clusters (Table 8), explaining various trends and themes of online consumer behavior.

Fig 10: Co-occurrence network of keywords

The first cluster, in red color, consists of significant keywords such as online review, online consumer review, and electronic word-of-mouth, indicating the key role of online reviews and electronic word-of-mouth on online consumer behavior research field. The second cluster, given in blue color, focused on the theme of various online marketing efforts of business firms, with keywords like digital marketing, social media marketing, online advertising, Facebook etc. The third cluster (green color) was centered around building and managing customer relationships online, comprised of keywords like customer satisfaction, website quality, customer loyalty etc. Finally, the last cluster (purple color) was focusing on the prime factors influencing the consumers' decision to shop online. Some of the keywords included in this cluster are reputation, online trust and perceived risk.

Table 8: Keyword network cluster analysis

Clusters	Featured keywords	Themes
Custer 1	Online consumer review, electronic word-of-mouth, information search	Influence of online consumer reviews and electronic word-of-mouth on information processing
Cluster 2	Social media marketing, online marketing, interactivity, facebook, online advertising, clickstream data, communication, privacy	Effect of company's digital marketing efforts on online consumer behavior
Cluster 3	Customer satisfaction, customer loyalty, service quality, website quality, social commerce, data mining	Managing customer relationships in online platforms
Cluster 4	Purchase intention, perceived risk, reputation, online trust	Significant consumer variables and their impact on decision making

The evolution of topic topics trending in various years has been illustrated in Fig 11, with the publication year on the horizontal axis and logarithmic value of frequency on the vertical axis.

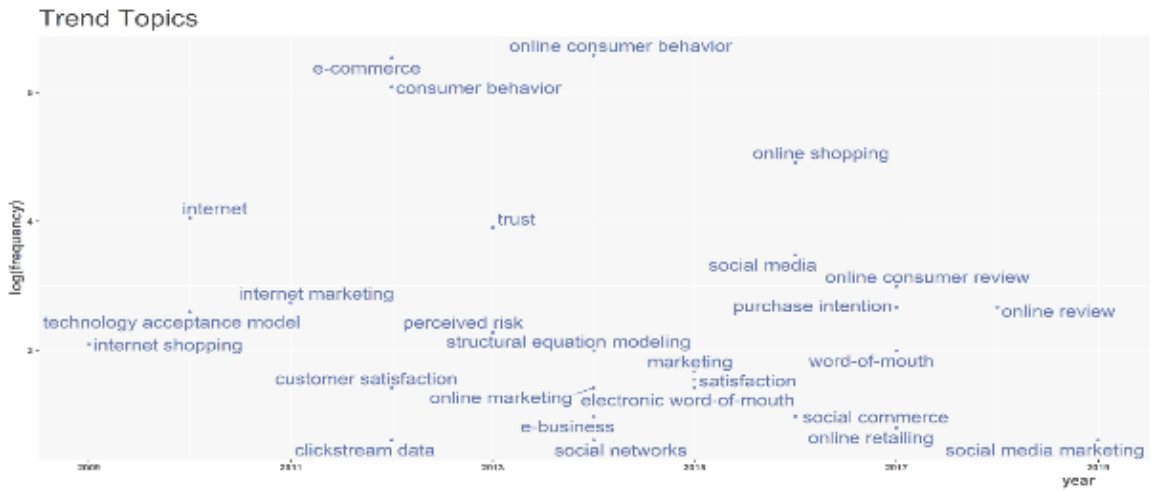

Fig-11: Trend topics in online consumer behavior research

The major topics related to evolution of e-commerce and online consumer behavior such as internet shopping, technology acceptance model, internet marketing, trust, perceived risk, and customer satisfaction, were trending till the year 2013. From the year 2014 to 2019, the focus shifted towards the social networks and word-of-mouth which included topics such as social media, social commerce, purchase intention, social media marketing, electronic word-of-mouth, and online review.

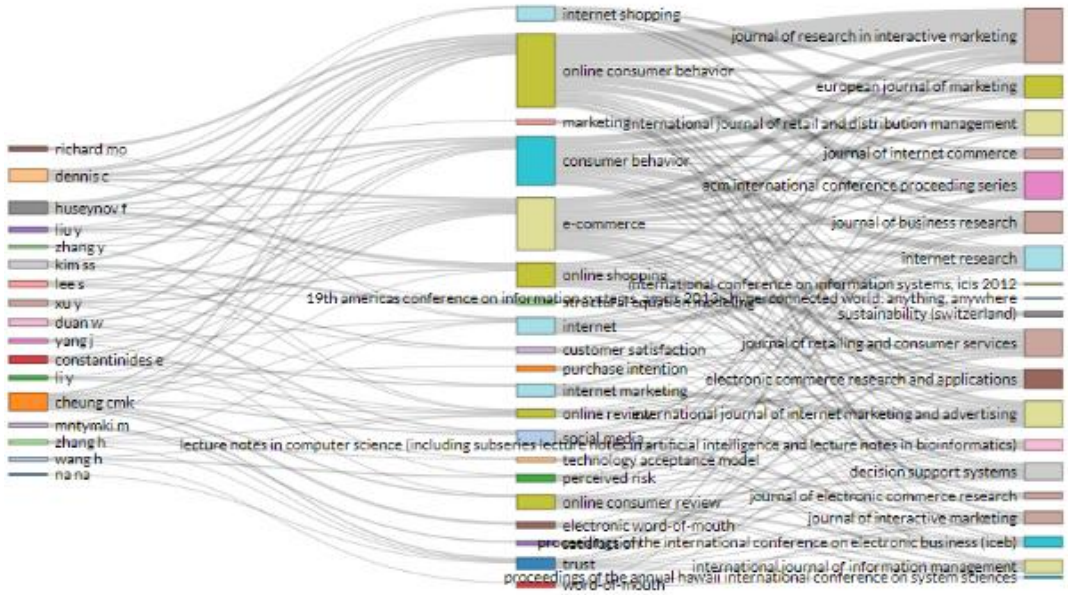

Fig 12: Three field plot

Fig 12 depicts the main items of three fields (authors, keywords, and sources) and their relations which has been visualized through Sankey diagram. This was developed based on top 20 authors, keywords, and sources of publications. It can be seen from the picture that the biggest node was for the main research theme of "online consumer behavior", followed by "consumer behavior", and "e-commerce".

In order to obtain the major themes in the online consumer behavior research, a bibliographic coupling analysis was performed in VOS Viewer. The bibliographic coupling stems from the similarity of two documents when they share similar references. As suggested by McCain (1990), a cut-off point was established (documents with minimum 20 citations), to have better structure of a research field, and this has resulted in using 287 documents used for bibliographic coupling analysis. Bibliographic coupling network of documents is presented in Fig-13, which resulted in 9 major clusters.

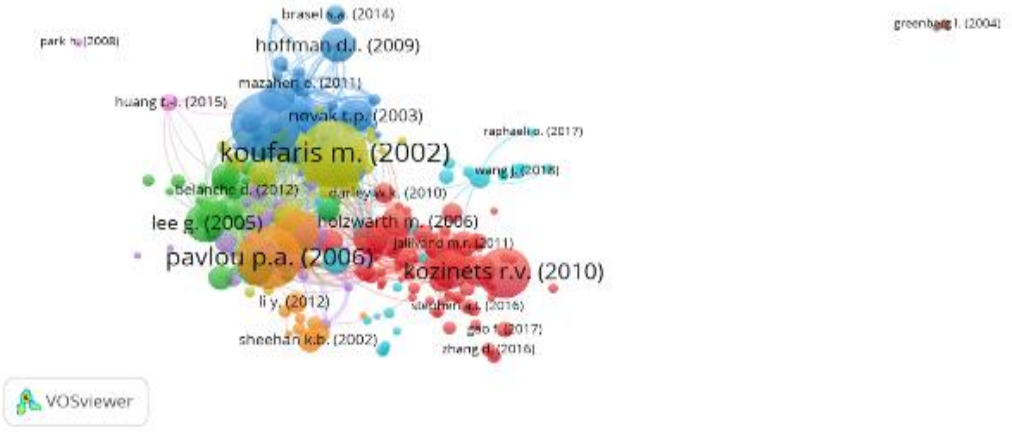

Fig 13: Bibliographic coupling of documents

Various themes are identified based on the clusters and appropriately named, as given in Table 9. Cluster 1 comprised of the research papers explaining the role of online reviews and electronic word-of-mouth in online consumer behavior. The theme of online consumers' perceptions of service quality, trust, satisfaction, and loyalty has been captured by cluster 2. The research papers that studied the influence of website attributes on enhancing shopping experience grouped in cluster 3. Various theoretical models explaining the online consumers' buying behavior have been covered in cluster 4. Similarly, the cluster 5 consists of studies examining the purchase intentions of online consumers. Cluster 6 includes the research papers that evaluated the usage of data mining techniques in this field. Cluster 7, 8 and 9 covered significant and distinct research themes viz. online privacy, online health, and Interactive techniques, respectively.

Table 9: Bibliographic coupling of documents – clusters and themes

Clusters	Featured publications	Themes
Custer 1	Kozinets *et al*., (2010); Cheung *et al*., (2008); Cheung *et al*., (2012)	Role of online consumer reviews and electronic word-of-mouth
Cluster 2	Lee & Lin (2005); Chen & Barnes (2007); Belanche *et al*., (2012)	Online Consumers' perception of trust, service quality, satisfaction and loyalty
Cluster 3	Novak *et al*., (2000); Parboteeah *et al*., (2009); Kim & Lennon (2013)	Online store atmospherics and customer experience
Cluster 4	Koufaris (2002); Forsythe & Shi (2003); Dennis *et al*., (2009)	Modelling the online consumer behavior
Cluster 5	Wells *et al*., (2011); Hajli (2013); Wu *et al*., (2016)	Online purchase intention
Cluster 6	Olbrich & Holsing (2011); Wang *et al*., (2018); Jansen & Schuster (2011)	Data mining
Cluster 7	Sheehan (2002); Li (2012); Milne *et al*., (2009); Xie *et al*., (2006)	Online privacy
Cluster 8	Greenberg *et al*., (2004); Pang *et al*., (2014); El Sherif *et al*., (2018)	Online health
Cluster 9	Huang & Liao (2015); Park *et al*., (2008)	Interactive Technologies - Virtual Reality and Augmented Reality

Co-citation analysis explains the structure of a research field by identifying the most cited documents through how many times two documents are cited together by other documents. There are three types of unit analysis available in this technique i.e., authors, journals and references, and this analysis would help us to identify the most influential documents published, authors and sources of documents.

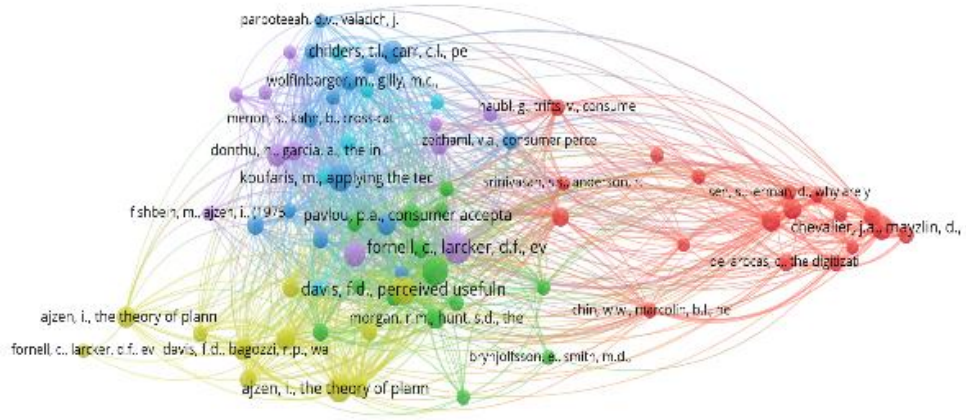

Fig-14: Co-citation analysis of documents

In order to detect the most cited documents in the online consumer behavior literature, a cut-off point of documents with a minimum of ten citations have been selected for analysis. There was a total of 52884 citations by all 1254 publications used in this study. Only 72 documents have met the minimum requirement of ten citations, which were used for further analysis. As seen in Fig-14, document co-citation network resulted in six clusters. These clusters were appropriately named based on the most-cited references in that cluster (Table 10).

Table 10: Cocitation network cluster analysis

Clusters	Featured publications	Theme
Cluster 1	Chevalier & Mayzlin (2006); Hennig-Thurau *et al*., (2004); Bickart & Schindler (2001)	Electronic word-of-mouth
Cluster 2	Gefen *et al*., (2003); Pavlou (2003); Bart *et al*., (2005)	Online trust
Cluster 3	Koufaris (2002); Childers *et al*., (2001); Wolfinbarger & Gilly (2001)	Hedonic and Utilitarian motivation
Cluster 4	Davis (1989); Venkatesh & Davis (2000); Venkatesh *et al*., (2003)	Technology Acceptance Theories
Cluster 5	Fornell & Larcker (1981); Anderson & Gerbing (1988); Baron & Kenny (1986)	Research Methods
Cluster 6	Bhattacherjee (2001); Gefen (2002); Shim *et al*., (2001)	Purchase and continuance intention

Citation burst analysis is used to signify the most active area of research through sudden surge of article's citations, that has attracted special attention from its scientific community in a given period. The burst detection has been performed in Sci2 tool, based on Kleinberg's algorithm (Kleinberg, 2003). To indicate the emerging trends of online consumer behavior research, the burst detection analysis of authors, journals and references has been performed.

Table 11 presents the top 10 authors with the strongest citation bursts. Taylor S. is the top ranked author with a maximum burst strength of 10.7184, whose contributions focused on developing theories related to information technology usage. Jarvenpaa S. L. is the author with longest citation burst duration of 11 years from 2002 to 2012, covering research mostly on building online trust.

Table 11: Authors' Citation Bursts

Authors	Weight	Length	Start	End
Jarvenpaa SL	9.8691	11	2002	2012
Bellman S	8.8587	6	2002	2007
Hoffman DL	8.0446	7	2002	2008
Taylor S	10.7184	5	2006	2010
Reichheld FF	7.3325	5	2007	2011
Klein LR	8.1625	3	2009	2011
Shim S	6.9722	6	2009	2014
Chang HH	7.5463	6	2015	2020
Liu Y	8.1532	5	2016	2020
Henseler J	7.1084	3	2018	2020

Bellman S., Hoffman D.L., Reichheld F.F., Klein L.R., Shim S., Chang H.H., and Liu Y., are the authors with strongest citation bursts from 2002 to 2020, with a coverage of research on various issues such as online buying behavior, online customer experience, e-loyalty, online information search, online purchase intention, online reviews etc.

Table 12 depicts the top 10 references with the strongest citation bursts. Duan *et al*., (2008) is the top ranked document with a burst strength of 4.9079, followed by Gefen *et al*., (2003) with a burst strength of 3.9961. Mazaheri *et al*., (2011) is the document having longest duration with 5 years, implying that this article has made extensive impact in the evolution of online consumer behavior literature. Gefen *et al*., (2003) highlighted the importance of trust in e-commerce, empirically validated a research model by extending the TAM. This study found that trust in e-vendor is a significant predictor of on intentions to use online shopping, along with other TAM variables i.e., perceived usefulness and perceived ease of use. An article by Pavlov (2003) has citation burst from 2007 to 2008. This paper investigates the role of trust and perceived risk in the context of e-commerce, because of the uncertainty perceived by the online consumers. Further, this study integrated trust and perceived with TAM in understanding the acceptance of e-commerce among the sample of students and online consumers. The results of this study confirmed the positive influence of trust, perceived usefulness and perceived ease of use and negative influence of perceived risk on online consumers' intention to transact on an e-commerce website, which in turn influences the actual transaction behavior.

Table 12: Co-Citation Bursts

Cited documents	Strength	Length	Start	End
Gefen *et al*., (2003)	3.9961	3	2006	2008
Pavlou (2003)	3.6082	2	2007	2008
Duan *et al*., (2008)	4.9079	4	2009	2012
Barnes *et al*., (2007)	2.9142	2	2010	2011
Bridges & Florsheim (2008)	3.819	4	2010	2013
Kim & Son (2009)	3.1858	3	2011	2013
Mazaheri *et al*., (2011)	2.9370	5	2012	2016
Sparks & Browning (2011)	3.6123	2	2015	2016
Floh & Madlberger (2013)	2.9487	2	2016	2017
Liu & Park (2015)	3.3432	3	2018	2020

A citation burst of Duan *et al*., (2008) is detected from 2009 to 2012. This paper examined how movie sales was influenced by online word-of-mouth. The findings of this study revealed that there is a positive relationship between movie sales and volume of online reviews. Further, this study found that online word-of-mouth might not directly impact customers' choices and purchasing decisions. Citation bursts from 2010 to 2013 are led by Bridges & Florsheim (2008), Barnes *et al*., (2007) and Kim & Son (2009). The utilitarian and hedonic motivation of online consumers was found to enhance their online shopping experience (Bridges and Florsheim, 2008). Internet users were classified into three major segments viz. 'risk averse doubters', open-minded online shoppers' and 'reserved information-seekers' based on three important characteristics i.e., 'neuroticism', 'willingness to buy', and 'shopping pleasure' (Barnes *et al*., 2007). A study by Kim & Son (2009) found that post-adoption behavior in online services is determined by the dedication and constraint-based mechanisms. Mazaheri *et al*., (2011) had significant attention between 2012 to 2016, developed a research framework based on stimulus-organism-response (S-O-R) model, in understanding the online consumer behavior. This study demonstrated the impact of emotions, site atmospherics, site attitude, site involvement and service attitudes on purchase intentions of online consumers from Canada and China. A research article by Sparks & Browning (2011), gained popularity from 2015 to 2016, highlighted the influence of e-word-of-mouth (online reviews) on purchase intentions and trust. One of the papers that received higher citations in the recent past (2016-2017) by Floh & Madlberger (2013), demonstrated the application of S-O-R model in understanding the online impulsive buying behavior. Finally, a publication by Liu & Park (2015), with the strongest citation bursts very recently from 2018 to 2020, emphasized the influence of three aspects of online reviews (reviewers' characteristics, quantitative facet, and qualitative facet of review characteristics) in shaping the perceived usefulness of user generated content.

The top 10 cited sources of publications with the strongest citation bursts from 2000 to 2020 are listed in Table 13. Communications of the ACM is the earliest journal that had the highest burst strength of 13.5698, followed by Information Technology and Management with the value of 8.9728. Both journals also had the longest duration of 8 years from 2000 to 2007 for CACM and 2006 to 2013 for ITM. They are focused on covering emerging trends in information technology and its practical applications.

Table 13: Journals' Citation Bursts

Journals	Weight	Length	Start	End
Communications of the ACM	13.5698	8	2000	2007
Sloan Management Review	6.4	7	2003	2009
Information Technology and Management	8.9728	8	2006	2013
Journal of the Association for Information Systems	7.8872	6	2008	2013
International Journal of Consumer Studies	7.7067	4	2014	2017
Journal of Marketing	7.8407	5	2016	2020
Computers in Human Behavior	7.05	5	2016	2020
International Journal of Hospitality Management	7.7251	4	2017	2020
Journal of Consumer Research	7.6035	4	2017	2020
Sustainability	6.62	3	2018	2020

Further, citation bursts of five journals (Journal of Marketing, Computers in Human Behavior, International Journal of Hospitality Management, Journal of Consumer Research and Sustainability) are closest to the present (from 2016 to 2020) and these publications are attracting more attention among the online consumer behavior researchers recently.

The burst detection analysis used in this research to explore the development and emerging trends in online consumer behavior research. Based on the results of citation bursts, it is recommended that more attention to be paid by research scholars towards those authors (Chang H.H., Liu Y., and Henseler J), references (Sparks & Browning 2011, Floh & Madlberger 2013, and Liu & Park 2015) and journals (Journal of Marketing, Computers in Human Behavior, International Journal of Hospitality Management, Journal of Consumer Research and Sustainability).

CONCLUSION

The main purpose of this review paper is to illustrate the knowledge themes and trends in online consumer behavior research. This paper presented a comprehensive view of the research area through bibliometric analysis, thus making a significant contribution to the theory of online consumer behavior. This paper is unique in using a variety of quantitative tools in bibliometric methods including the content analysis; citation analysis; co-occurrence analysis; co-citation analysis; bibliographic coupling analysis; and citation burst analysis, to illuminate the intellectual structure of this research. It can be concluded from the results of various bibliometric techniques, some of the suggested areas requiring additional focus from the research scholars are: Online Consumer Reviews; Social Commerce; Big Data (Data Mining, Text Mining); Interactive Technologies (Augmented Reality, Virtual Reality); and E-tailing ethics.

This study suffers from few limitations. First, the articles were extracted from only database i.e., Scopus, and did not cover the publications in other indexed databases like Web of Science. The need for combining research documents from more than one database could extend the scope and potential of generalizing the results. Similarly, the bibliometric methods used in the research might suffer from certain conceptual limitations, which could affect the validity of the study. Although the study considered many articles for analysis, there could still be researchers' bias in identifying the research themes and providing explanation to the results.

The results of this research will surely be useful for researchers in online consumer behavior domain, to have a better understanding of the evolution of literature, theoretical foundations, and the future research directives. Similarly, the marketing practitioners can also make use of the outcome of this research, especially significant contributions made by the researcher's community and future research trends in understanding the complex and dynamic phenomenon of online consumer behavior.

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