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Bibliometric Analysis: Consumers Interest in E-Commerce using VOSviewer

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Abstract
Purpose: The focus of this research is to evaluate the trend of consumer interest in e-commerce in the last 10 years using data accessed from the Scopus online database. Design/methodology/approach: This study measures bibliometric analysis of 17,988 articles from 366 journals during 2013-2022. Findings: The findings show that the trend of publications about consumer interest continues to increase. The most cited article is Effect of social commerce factors on user purchase behavior: An empirical investigation from renren.com with 150 citations. The country with the highest number of publications is China with 90 publications with 732 citations. Research limitations/implications: This study has limitations on the database which is only sourced from the Scopus database. Originality/value: This study makes the most influential contribution and impacts to research on emerging consumer interests in various fields, including leading researchers and their country of origin.

Keywords: Scopus, VOSviewer, Bibliometric Analysis, Consumer Interest, E-commerce

1. Introduction

The Covid-19 pandemic is still not over, especially in Indonesia. New variants of the Covid-19 virus, namely Omicron (Ettaboina, Nakkala, and Laddha 2021) are still increasing in Indonesia (Task Force for Handling Covid-19 2021). Covid-19 has caused changes in various sectors, one of which is the economic sector. The changes that occurred were due to restrictions on interacting directly (Ministry of Health of the Republic of Indonesia 2020), thus maximizing the use of technology in online transactions. The transaction carried out is to buy products online by visiting e-commerce such as Shopee, Tokopedia, and Lazada.

In recent years, traditional business activities that have led the country's economic growth have had to quickly transform into a form of technology and information-based business commonly known as online business. Selling online or doing business online has many advantages over traditional sales, one of which is selling online more efficiently because consumers can make purchases from home using smartphones. Almost all activities outside the home are limited, especially during the Covid-19 pandemic. All of the important activities, including economic activities, are restricted and pursued virtually (Rakib et al. 2020).

For Indonesians, easy and convenient shopping is a very convenient and pleasant thing. Technology presents an alternative place to buy and sell that is acceptable to the public. The growth of online businesses around the world (Nisar and Prabhakar 2017) confirms the role of technology in the internet revolution. Hopefully, the use of the internet allows e-commerce to become increasingly widely used.

From previous research, utilitarian value directly triggers purchase intent in consumers, while consumers get hedonistic value from searching and browsing in online stores before making a step purchase (Topaloğlu 2012). In addition, research (Bai, Yao, and Dou 2015) found that social support, seller uncertainty, and product uncertainty influence user behavior. Further results show that social factors can significantly increase users' purchasing intentions in social shopping. Then, another study suggested that the factors that influence consumers' interest in shopping online are (1) *Perceived Concentration*, (2) *Perceived Enjoyment* and (3) *Perceived Ease of Use* (Purwaningsih and Adison 2016) . Another study that also focuses on measuring consumer interest using *eye tracking*, that the product that consumers like does not necessarily have an attractive appearance, because there are several other factors that make consumers prefer the product (Sari et al. 2018).

In addition, other research related to e-commerce stated that marketing communication strategies require interesting and unique concepts in each promotion so that people are interested in buying products and services sold by the company (Dewi and Hartono 2019). The study (Fu et al. 2020) found that the behavior of searching for consumers' online reviews was substantially influenced by the level of human contact of recycled products. It was found that consumers rely on reviews of the perception of safety when buying goods with high contact. The findings in another study explained that consumers' purchasing decisions to buy through online applications are positively influenced by *buying interest*, *value perception*, and *trust* (Hidayat et al. 2021). Referring to (Kennedyd et al. 2022) that developing PI (*Purchase Intention*) behavior alone does not lead to online shopping site commitments or customer loyalty and repeat purchases. Online site loans are generated by the EPP (*E-commerce Platform Preference)* factor; Among these factors, order fulfilment and company   image of online shopping platforms contribute the most, indicating that the priority of six factors (*price, product variety, site awareness, recommendation trust, company image, site design, order fulfilment*) this should be the starting point when practitioners design an online shopping platform.

This research was compiled with the aim of analyzing "*Consumer Interest in E-commerce*" in the last ten years by analyzing related documents in the Scopus database search. Then it is processed and analyzed using the VOSviewer application program to find out the bibliometric map "*Consumer Interest in E-commerce*."

2. Literature Review

2.1 Interest

Intention is the closest predictor of behavior, this is affirmed in the model developed by Ajzen in the theory of reasoned action as well as the theory of planned behavior. Intention plays a unique role in directing actions, that is, linking the deep considerations that a person believes and desires with certain actions. Based on the foregoing, it can be concluded that intention is a person's desire to perform an action or give rise to a certain behavior accompanied by certain efforts (Hidayat et al. 2021). According to Ajzen (2005) in (Hidayat et al. 2021) intention is considered as an intermediary of motivational factors that have an impact on a behavior. According to Kotler (2011) in (Hidayat et al. 2021) buying interest is a feeling that arises from the consumer after seeing or knowing information about the product; the consumer will try the product and ultimately have the desire to buy and own

the product. Buying interest is acquired due to the perception formed from the learning process and the thought process. Buying interest is a motivation that continues to be recorded in the minds of consumers and becomes a desire that must be fulfilled (Hidayat et al. 2021).

The formation of intentions can be explained by the theory of planned behavior which considers that human beings always have a purpose in behaving. Previous research has identified the positive influence of buying interest on the decision to buy a product. The presence of a relationship between buying interest and purchasing decisions, high consumer buying interest will encourage consumers to buy the desired product. Conversely, low buying interest will hinder consumers from buying the product. If the buying interest is high then the consumer will decide to buy the product (Herche 1994).

2.2 Factors affecting buying interest

The buying behavior of a consumer is influenced by cultural, social, and personal factors (Kotler and Keller 2016). Cultural factors are culture, subculture and social class. Social factors such as refences groups, family and social role and status. Personal factors include age and stages in the life cycle, work and economic circumstances, personality and self-concept, as well as lifestyle and values.

In addition, it refers to (Noer, Putra, and Adriani 2022) that utilitarian motivation and hedonistic motivation affect consumers' buying interest. Explained about utilitarian spending motivation reflects the desire of consumers to make efficient, rational, and goal-oriented efforts (Anderson and Simester 2014). Whereas, hedonistic motivation refers to multisensory aspects, fantasies, and aspects of consumptive emotions (Hirschman and Holbrook 1982).

2.3 E-commerce

Electronic media, such as online discussion forums, bulletin board systems, and electronic news groups, are important sources of information that facilitate the exchange of information among influential consumers (Kane, Mishra, and Dutta 2016). According to Turban (2002) in (Dewi and Hartono 2019) e-commerce or electronic commerce is a concept that explains the series of buying, selling and exchanging products, services and information through a computer network, namely the internet. Defined as commercial activities and transactions conducted electronically over the internet, e-commerce combines traditional economic behavior and a rapidly evolving cyber infrastructure and provides a connection between the real world and the virtual world through the flow of capital, ideas, and goods (Zhang 2019). E-commerce is a combination of traditional business models and network technology and information technology in the information age, thus facing important opportunities and challenges (Fu et al. 2020).

E-commerce provides personalization to provide product information that consumers like. In e-commerce, consumers give an assessment on the product after purchasing the goods. Rating information and transaction information can be combined to generate product recommendations. Product recommendations result in a list of preferred and purchased products. Product recommendations can be used to provide product information to other consumers and as a solution to information overload (Sari et al. 2018).

3. Research Methods

This study focuses on unearthing the latest information on research trends in the last ten years by using a bibliometric indicator that conceptualizes data on the topic of consumer interest. The search engine in the Scopus database filters publications from 2013-2022 to identify the literature broadly against the concept of consumer interest.

Researchers chose the publication collection period from 2013 because there was a consistent growth in the number of publications during this period compared to the previous period. The popularity of the topic of consumer interest increased in 2009-2012, causing the growth of publications.

Scopus is one of the most extensive citations for entering an abstract database undergoing a thorough review of peers (Nuryakin, Ngetich, and B 2022). The study focuses only on international journals extracted using search engines from the Scopus database accessed for a fee. The search for journals is limited to obtaining the maximum amount corresponding to the interest of consumers in e-commerce in the publication period. The author compiled articles published in 2013-2022 with the highest number of publications.

The initial search identified 17,988 journals with keywords: (TITLE-ABS-KEY (consumer) AND TITLE-ABS-KEY (interest)) AND PUBYEAR > 2012 AND PUBYEAR < 2023 AND PUBYEAR > 2012 AND PUBYEAR < 2023, then reduced to 336 journals with keywords: (TITLE-ABS-KEY (consumer) AND TITLE-ABS-KEY (interest) OR TITLE-ABS-KEY (consumer AND interest) AND TITLE-ABS-KEY (e-commerce)) AND PUBYEAR > 2012 AND PUBYEAR < 2023 AND PUBYEAR > 2012 AND PUBYEAR < 2023. Furthermore, 336 journal documents obtained from the Scopus database, were stored in RIS format to be processed using VOSviewer software.
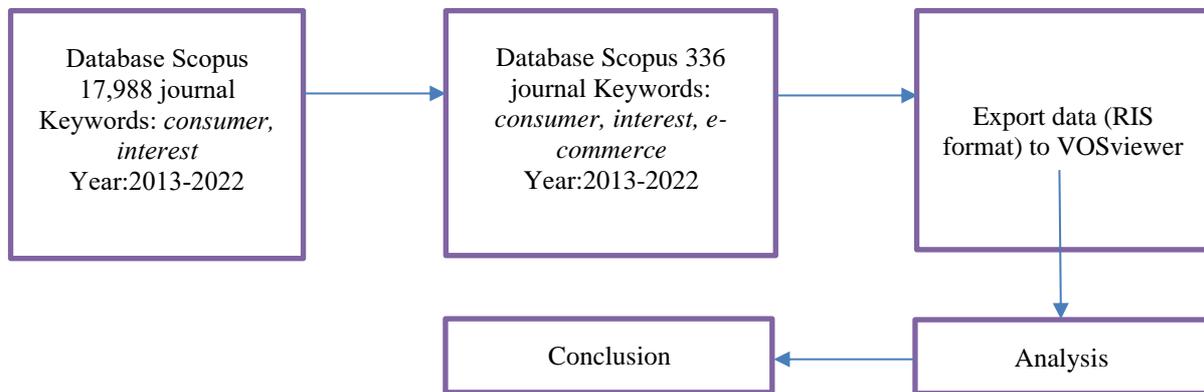

Figure 1: Research Methods

4. Analysis and Discussion

4.1 Publications per Year

Research on consumer interest in e-commerce from 2013 to 2022 became popular and interesting to discuss further. From 2013 to 2018, there were no more than 30 journals per year, but gradually increased even though in 2014 there was a decline. In 2019 to 2022 more than 40 publications per year, but it decreased in 2020 and 2022 (see figure 1). The highest publication occurred in 2021, namely 60 journals.
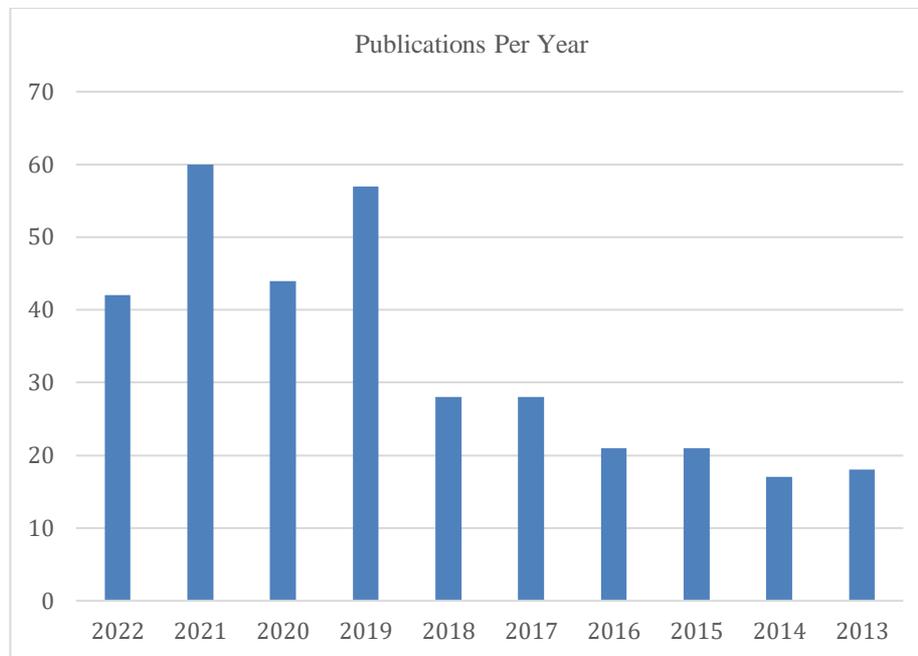
Figure 2. Publications per Year

4.2 Most cited documents

This section features the 10 most followed journals from publications. Research journals are ranked by volume of citations from the highest to the lowest of the 10 journals.

Table 1: Top journals cited/cited

No	Publication Title	Year	Writer	Citations
1	Effect of social commerce factors on user purchase behavior: An empirical investigation from renren.com	2015	Bai, Y., Yao, Z. , Dou, Y.-F.	150
2	A review of the environmental implications of B2C e-commerce: a logistics perspective	2015	Mangiaracina, R., Marchet, G. , Perotti, S. , Tumino, A.	99
3	Intelligent decision-making of online shopping behavior based on internet of things	2020	Fu, H., Manogaran, G. , Wu, K. , (...), Jiang, S. , Yang, A.	86
4	A framework for fake review detection in online consumer electronics retailers	2019	Bearded, R., Araque, O. , Iglesias, C.A.	85
5	Building E-Commerce Satisfaction and Boosting Sales: The Role of Social Commerce Trust and Its Antecedents	2019	Lin, X., Wang, X. , Hajli, N.	80
6	A method for discovering clusters of e-commerce interest patterns using click-stream data	2015	Su, Q., Chen, L.	76
7	How can a mobile vendor get satisfied customers?	2013	San-Martin, S., López-Catalán, B.	70
8	A personalised movie recommendation system based on collaborative filtering	2017	Subramaniyaswamy, V., Logesh, R. , Chandrashekhar, M. , Challa, A. , Vijayakumar, V.	69
9	A dual model of product involvement for effective virtual reality: The roles of imagination, co-creation, telepresence, and interactivity	2019	Cowan, K., Ketron, S.	65

10	Initial trust and intentions to buy: The effect of vendor-specific guarantees, customer reviews and the role of online shopping experience☆	2018	Stouthuysen, K., Teunis, I. , Giants, E. , Slabbinck, H.	57

Based on Table 1, the most cited journal on consumer interest in e-commerce is *the effect of social commerce factors on user purchase behavior: An empirical investigation from renren.com* (Bai, Yao, and Dou 2015). The journal develops and validates conceptual models of how social factors, such as social support, seller uncertainty, and product uncertainty, affect users' purchasing behavior in social commerce. This study aims to provide an understanding of the relationship between user behavior and social factors on social networking platforms. The next most cited journal is *a review of the environmental implications of B2C e-commerce: a logistics perspective* (Mangiaracina et al. 2015). The journal offers a review of current literature on the topic of environmental sustainability of B2C e-commerce, specifically from a logistics perspective.

4.3 Most influential countries

In this section, the 10 countries with the highest number of publications in the period from 2013 to 2022 are described (see Figure 3). The first place is China with 90 publications with 732 citations, then the United States with 42 publications with 581 citations, India with 36 publications with 132 citations, Indonesia with 30 publications with 60 citations, The United Kingdom with 17 publications with 260 citations, Taiwan with 15 publications with 137 citations, Australia with 13 publications with 132 citations, Germany with 13 publications with 95 citations, Italy with 11 publications with 171 citations, and Malaysia with 171 citations, and Malaysia with as many as 9 publications with 59 citations.
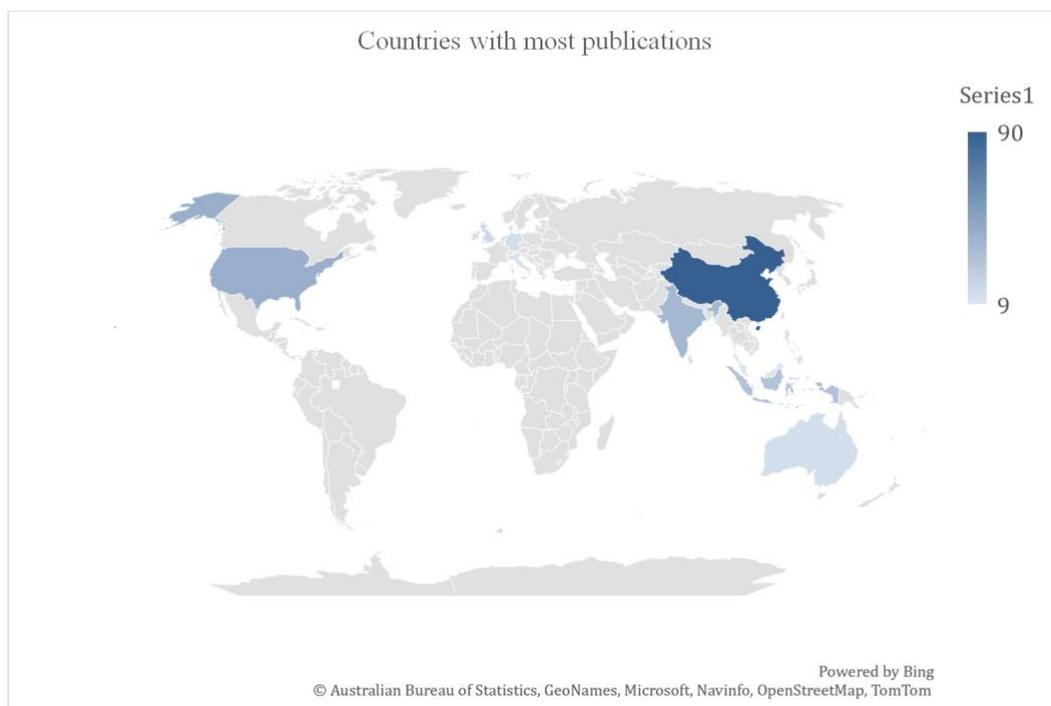

Figure 3: Countries with the Highest Number of Publications

4.4 Authors with the most publications

In this section, the 10 authors with the most publications are described in the period from 2013 to 2022 (see Figure 4). The first order is Ferdiana, Nugroho, and Sari, namely 3 publications with 12 citations, then Bai as many as 2 publications with 160 citations, Bauerová as many as 2 publications with 9 citations, Besana as many as 2 publications with 1 citation, Buldeo as many as 2 publications with 16 citations, Esposito as many as 2 publications with 1 citation, Hajli with 2 publications with 100 citations, and Huseynov with 2 publications with 35 citations.
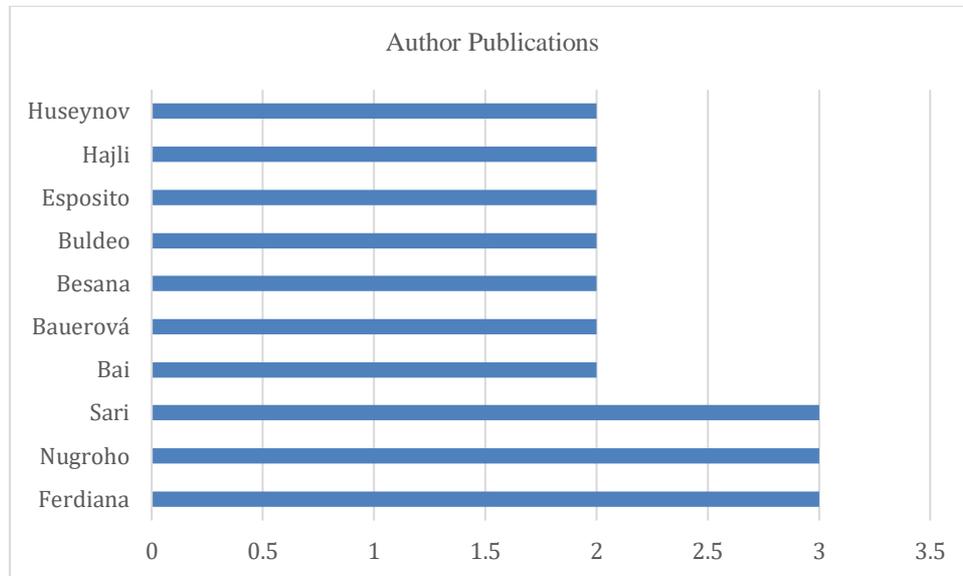
Figure 4: Author Publications

4.5 Publication fields

In this section, it describes the 10 most publication areas in the period from 2013 to 2022 (see Figure 5). Computer science ranks first with 178 journals cited with 1360. Business management and accounting with 109 journals cited as many as 1098. Engineering with 86 journals cited as many as 336. Social sciences with 72 journals cited as many as 785. Econometrics and finance with 52 journals cited 307. The science of decision making with 39 journals cited as many as 276. Mathematics with 30 journals citations as many as 65. Environmental science with 14 journals citations as many as 59. Energy with 13 journals cited as many as 53. Arts and humanities with 10 journals cited as many as 60.
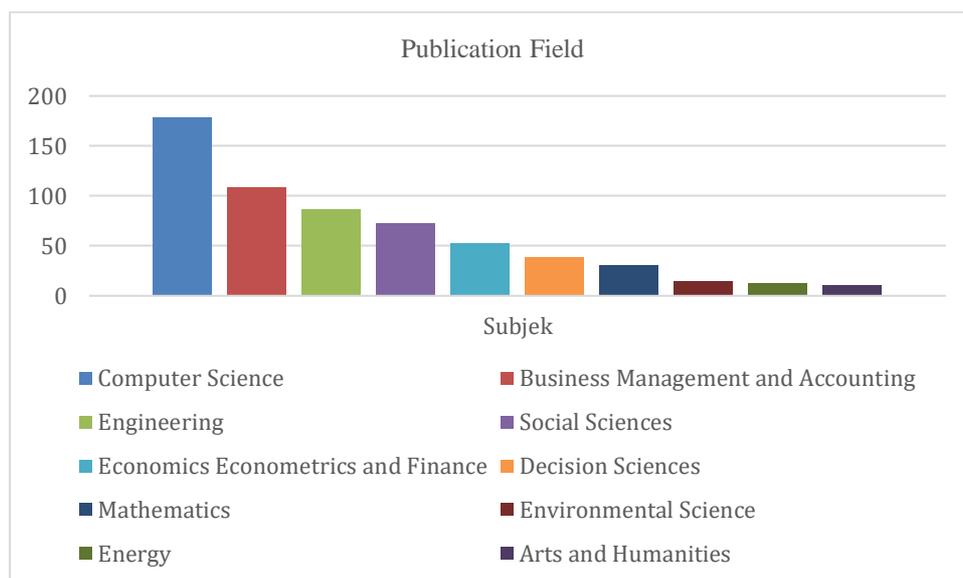

Figure 5: Publication Field

4.6 Analysis co-authorship of author

In this section, by using the type of analysis, namely *co-authorship* with the unit of analysis is the author. There are 5 clusters, namely cluster 1 in red, cluster 2 in green, cluster 3 in blue, cluster 4 in yellow, and cluster 5 in purple (see Figure 6).
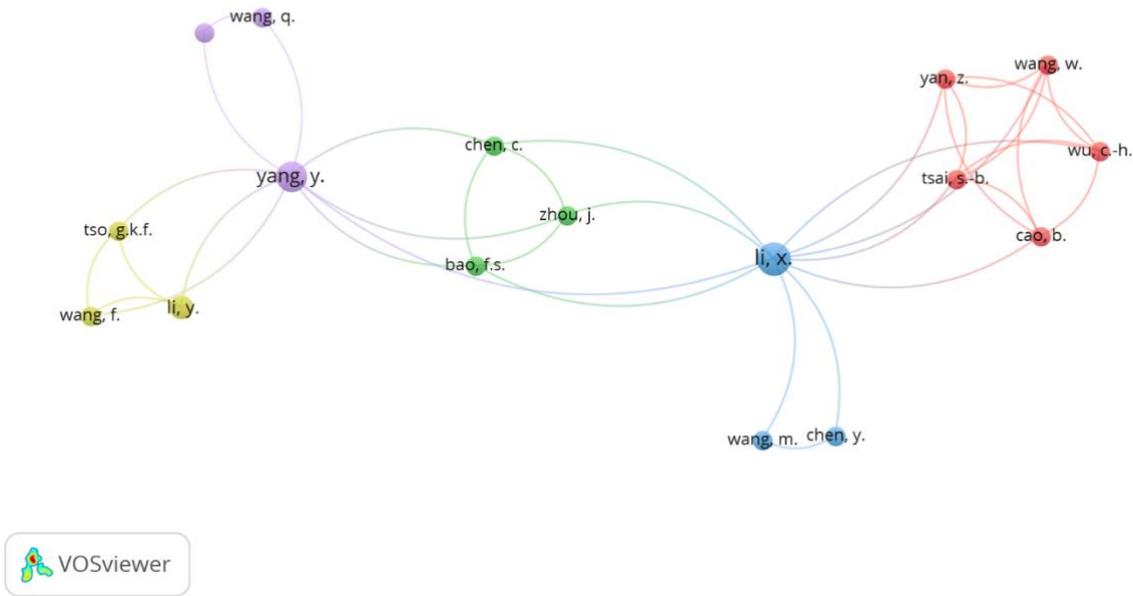
Figure 6: *Co-authorship of author*

4.7 Bibliometric Networks

The display presented in Figure 7 explains that each circle represents a keyword or term that appears frequently. Researchers highlighted that there are 3 most dominant nodes, namely electronic commerce, e-commerce, and consumer behavior. This shows that in 336 journals processed using VOSviewer the keywords that most often appear are electronic commerce, e-commerce, and consumer behavior in the period from 2013 to 2022.
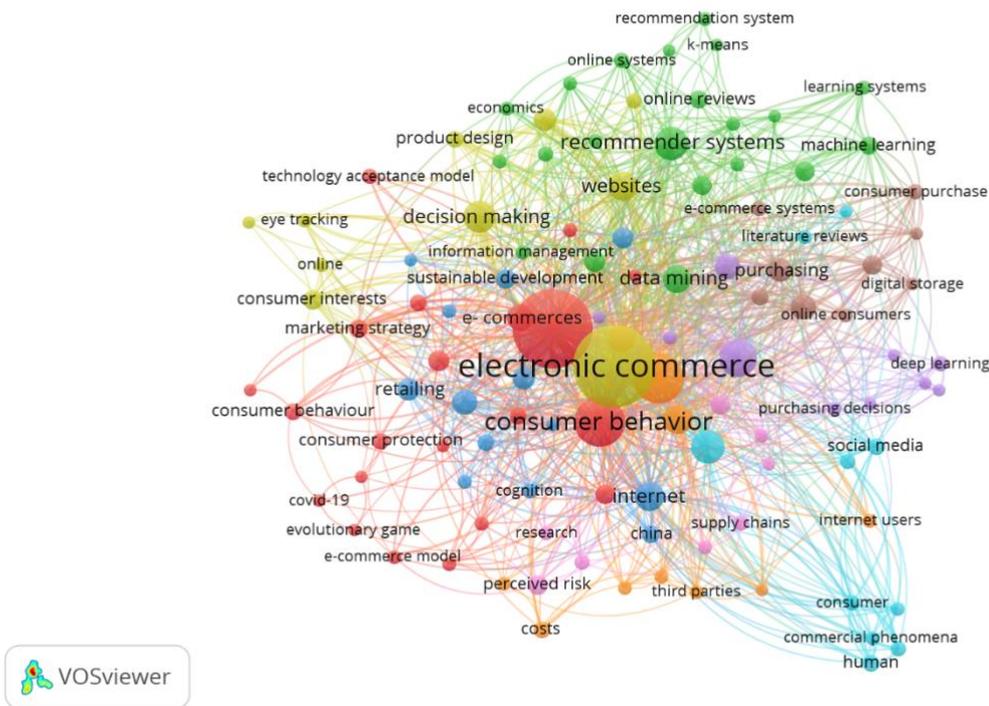

Figure 7: *Co-occurrence of keywords*

The consumer interest node is connected to the electronic commerce, e-commerce, decision making, consumer interests, and eye tracking nodes (see Figure 8). Consumer interest related to electronic commerce, e-commerce, decision making, consumer interests, and eye tracking refers to research conducted by (Sari et al. 2018) whose research focus is on measurement of consumer interest and prediction of product selection in e-commerce using the eye tracking method.
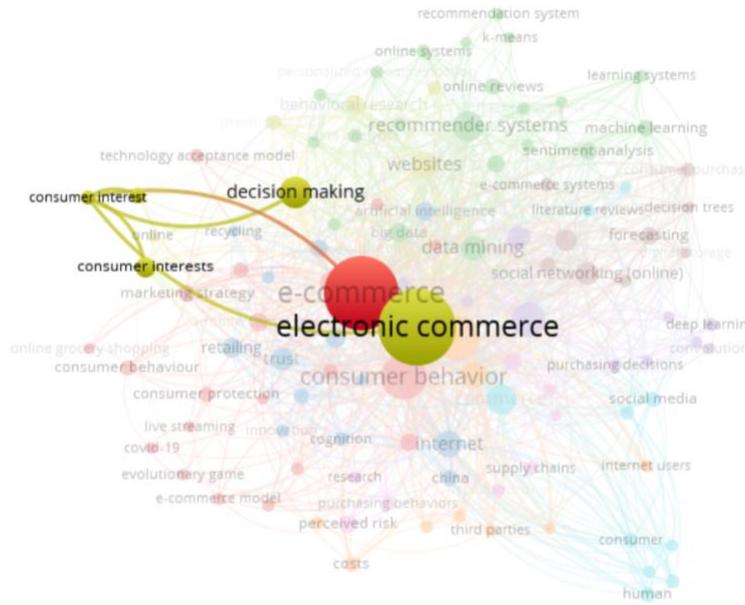

Figure 8: Consumer interest network

Consumer interest nodes are connected to electronic commerce nodes, e-commerce, consumer behavior, sales, decision making, recommender systems, commerce, data mining, e-commerce, surveys, behavioral research, big data, mobile commerce, consumer protection, live streaming, e-commerce model, online, eye tracking, and consumer interest (see Figure 9). Referring to research (Bai, Yao, and Dou 2015) which focuses on the influence of social commerce factors on user purchasing behavior with empirical investigations of renren.com in line with Figure 9 that consumer interest s relates to electronic commerce, e-commerce, consumer behavior, and other nodes.
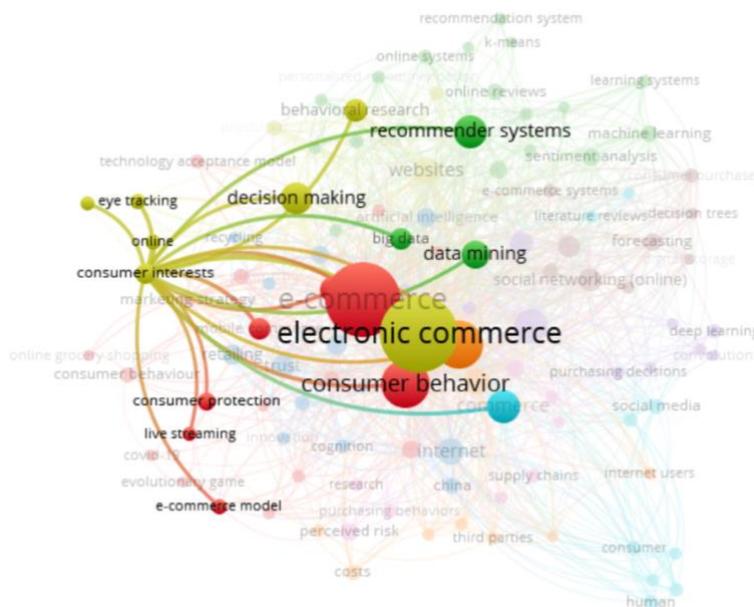

Figure 9: Consumer *interests* network

From the results of the analysis, 336 journals can then be grouped into 9 clusters that are distinguished by their color (see Table 2). Cluster 1 in red consists of 21 keywords, cluster 2 in green consists of 21 keywords, cluster 3 in blue consists of 13 keywords, cluster 3 is blue consists of 13 keywords, cluster 4 in yellow consists of 10 keywords, cluster 5 is purple with 10 keywords, cluster 6 is colored toska consists of 10 keywords, cluster 7 is colored orange consists of 10 keywords, cluster 8 with brown colors consists of 9 keywords, and cluster 9 in pink consists of 8 keywords.

Table 2: Clusters by keyword

Cluster 1	*Competition, consumer behavior, consumer behaviour, consumer protection, covid-19, cross-border, cross-border e-commerce, consumer satisfaction, e-commerce, e-commerce, e-commerce model, evolutionary game, live streaming, marketing strategy, mobile commerce, online grocery shopping, online platform, online transaction, semantics, technology acceptance, and topic modelling*
Cluster 2	*B2C e-commerce, big data, classification (of information), collaborative filtering, data analytics, data mining, economics, information management, intelligent systems, k-means, learning systems, machine learning, online reviews, online systems, personalized recommendation, profitability, recommendation system, recommender systems, sentiment analysis, statistical analysis, and sustainability*
Cluster 3	*Artificial intelligence, China, cognition, consumption behavior, innovation, internet, purchase intention, recycling, retailing, shopping activity, supply chain management, sustainable development, and trust.*
Cluster 4	*Behavioral research, consumer interest, consumer interests, decision making, electronic commerce, eye tracking, online, online consumer behavior, product design, and websites.*
Cluster 5	*Convolution, convolutional neural networks, deep learning, e-commerce websites, electronic word of mouths, online shopping, product reviews, products and services, purchasing decisions, and structural equation modelling.*
Cluster 6	*Article, commerce, commercial phenomena, consumer, consumer attitude, human, literature review, literature reviews, social commerce, and social media.*
Cluster 7	*Consumer buying, costs, information asymmetry, internet users, manufacture, marketing, regression analysis, sales, surveys, and third parties.*
Cluster 8	*Consumer purchase, decision trees, digital storage, e-commerce systems, forecasting, online consumers, purchase decision, purchasing, and social networking (online).*
Cluster 9	*Consumer preferences, crowdsourcing, information systems, perceived risk, purchasing behaviors, research, search engines, and supply chains.*

5. Findings

Based on the results of the analysis of *the co-occurrence of keywords* (see Figure 7), the consumer interest node is not the dominant node, but the dominant node is electronic commerce, e-commerce, and consumer behavior. This means, in 336 journals the keywords that most often appear are not consumer interest even though in the Scopus search engine the keywords used already use consumer interest.

Research on consumer interest in e-commerce in 2013 to 2022 reached the highest publication in 2021 with a total of 60 publications. Then the most cited journal is *the effect of social commerce factors on user purchase behavior: An empirical investigation from renren.com* (Bai, Yao, and Dou 2015) with 150 citations. The country with the most number of publications is China with 90 publications with 732 citations. The authors with the most publications are Ferdiana, Nugroho, and Sari. The field of publication with the highest number is computer science with 178 journals cited as many as 1360.

6. Limitations and Recommendations

This research has limitations on databases that are only sourced from the Scopus database, while other studies such as (De Bakker, Groenewegen, and Den Hond 2005) use databases from ISI Web of Science Social Science Citation Index (WoS/SSCI) and ABI/Inform Archive Database Complete, Global, and Trade & Industry

(ABI/Inform). To avoid the occurrence of data duplication, it is recommended to use two databases. There are still several more techniques in bibliometric analysis that have not been discussed by the author, so in the future it is expected to be able to explore more techniques in bibliometric analysis.

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