

Recent Development Trend of Electronic Commerce Research: 2000 to 2016

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ABSTRACT

The current study aims to identify the recent research trend of electronic commerce research and report theoretical background used in the electronic commerce research articles. By searching the five electronic commerce research journals, including Electronic Commerce Research, Electronic Commerce Research and Applications, International Journal of Electronic Commerce, Journal of Electronic Commerce Research, and Journal of Theoretical and Applied Electronic Commerce Research listed in the Social Sciences Citation Index (SSCI) database in a seventeen years period between January 2000 and December 2016, we found 1,205 electronic commerce research articles. By analyzing these articles, the current study maps the trend and reveals the highly influence research article. The current study also reveals theories that used in the electronic commerce research articles. The results provide fundamental insights on the recent research of electronic commerce.

Keywords: Bibliometric, Literature Review, Electronic Commerce, Social Science Citation Index, SSCI

INTRODUCTION

Electronic commerce is currently becoming a blooming research field. Thanks to the advances of information communication technology infrastructure, as well as the high penetration of internet and mobile communication connection, people now can do a variety of commerce activities online. Enormous online application and activities are available worldwide without time and geographic scope limitation. Electronic commerce is not just a fashion term, it is now a part of our daily life.

Electronic commerce are being adopted by nearly all industry. Electronic commerce enrich the means that managers do business transaction as well as manage their organizations. The electronic commerce research is also blooming for the past few decades and attracts the focus from both academics and industry of various fields.

This study aims to provide a comprehensive understanding of recent trends of electronic commerce research. Electronic Commerce can refer to the online transactions of buying or selling merchandises and service. Nevertheless, some business activities are also regarded as electronic commerce although these activities are not directly linked to buying or selling some things. There is no consensus on the scopes of electronic commerce. There is also no consensus on the definition of electronic commerce (Ngai & Wat, 2002). In the current study, we aim to explore the research topics and scopes of electronic commerce. To accomplish this aim, we used bibliometric and text mining techniques to analyze the articles published in electronic commerce relative journals. The electronic commerce journals in the current study are defined by the journals with the term of “electronic commerce” in their journal titles. To limit our research scope, only electronic commerce relative journals listed in Science Citation Index (SCI) and Social Science Citation Index (SSCI) are included in the current study. The current study makes use of bibliometric approach and text mining to reveal research trend of electronic commerce research, and to serve as a roadmap for both academics and practitioners.

The purposes of this study are twofold: (1) Analyze distribution of electronic commerce articles, such as publication years and countries of authors, published journals, and citation times. (2) Analyze the theoretical background of electronic commerce research by analyze the abstracts of the electronic commerce articles. This paper is structured in four sections. The current section provides a brief introduction for this study. Then, the second section introduces bibliometric that used in the current study. Next, this study explains the analysis results. Finally, we conclude the article with a discussion of limitations and implications for future research.

METHODS

The study searched titles and abstracts of electronic commerce research articles to identify research topics electronic commerce. The sources of databases were Social Science Citation Index (SSCI) and Sciences Citation Index (SCI). The study chose SSCI/SCI database since it earned a good reputation as the leader among electronic database of academic literature. This study restricted articles published in the following five journals with the terms of “electronic commerce” in their journal names: Electronic Commerce Research, Electronic Commerce Research and Applications, International Journal of Electronic Commerce, Journal of Electronic Commerce Research, and Journal of Theoretical and Applied Electronic Commerce Research. The current study did not include the Journal of Organizational Computing and Electronic Commerce since it contains two sub fields: Organizational Computing and Electronic Commerce. It is not easy to discriminate papers of organizational computing from electronic commerce that are published in the Journal of Organizational Computing and Electronic Commerce. Only papers published in the period between 2000 and 2016 are included in the current study.

The current study collected 1,419 articles. Among them, 214 articles were not included in the current study since they were editorial materials (170 articles), review (40 articles), correction (3 articles), and biographical item (1 article). The remained 1,205 articles are regular research papers. To confine the range of the articles to research articles, the study selected only the 1,205 regular articles for bibliometric and text mining analysis. Figure 1 revealed the number of electronic commerce articles by years. Based on figure 1, we can find that the number of published electronic commerce articles excess one hundred per year since 2010. The peak year was 2015, in that year the electronic commerce journals published totally 128 articles.

The current study only includes articles collected in the SSCI database. Papers were not included in the current study if they were not collected in the SSCI database, even these papers were published in the selected journals during the selected period. For examples, the journal “Electronic Commerce Research” was included in SSCI database since 2008, which means that papers published in “Electronic Commerce Research” in and before 2007 were not included in the current study. Another example is the “Journal of Theoretical and Applied Electronic Commerce Research” that was include in SSCI database since 2014, which means that papers published in “Journal of Theoretical and Applied Electronic Commerce Research” in and before 2013 were not included in the current study.

This study aims to explore the recent development of electronic commerce research by the identified 1,205 research articles published in electronic commerce

relative journals. Although the articles included in the current study were not exhaustive, the current study hopes to serve as a comprehensive base for an understanding of recent trend of electronic commerce research. This study collected the bibliographic data of all the 1,205 electronic commerce research articles to observe distribution of publication years, countries of authors, published journals, and cited times.

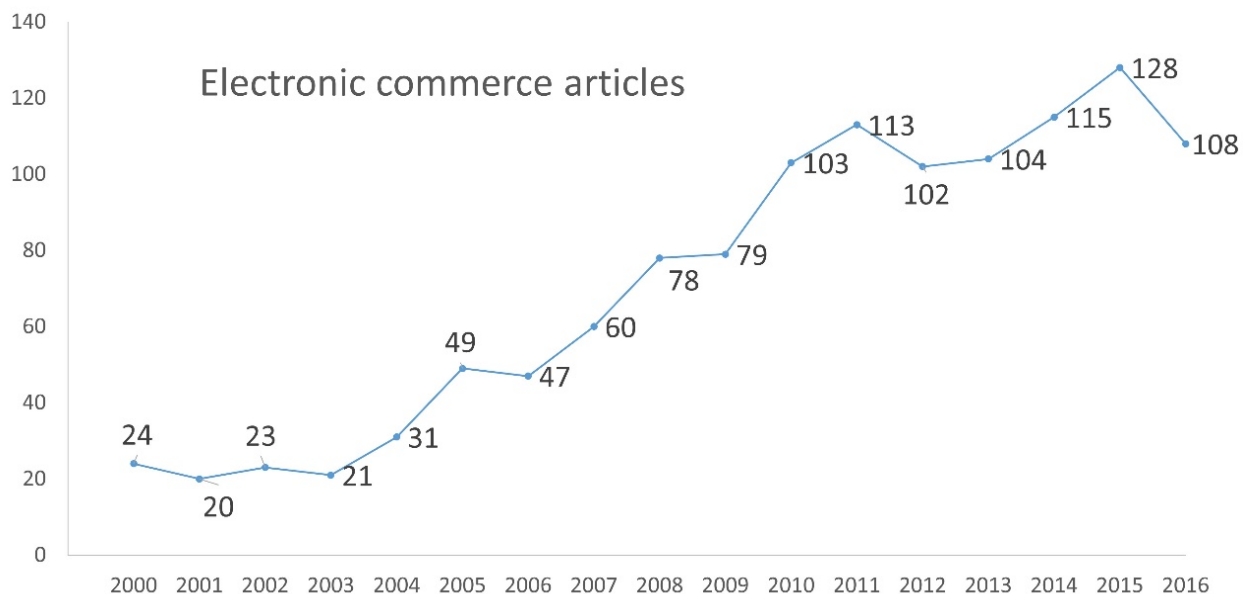


Figure 1 Electronic Commerce Publications from 2000 to 2016

RESULTS

Distribution of the Year of Publication

Figure 1 and Table 1 illustrate the annual number of published electronic commerce research articles from 2000 to October 2016. The blossoming of computer and information technology enhance the development of electronic commerce activities. As revealed in Fig. 1, only 20s to 31 electronic commerce research articles were published per year before 2004. Nevertheless, the amount of published articles dramatically increased from 49 in 2005 to 103 articles in 2010 and to 128 in 2015. The increase in the number of electronic commerce research articles reflected the popular of electronic commerce activities, which demonstrates that academics and researchers gradually pay attention to electronic commerce research.

Table 1 Electronic Commerce Publications by Journals from 2000 to 2016

	Electronic Commerce Research	Electronic Commerce Research and Applications	International Journal of Electronic Commerce	Journal of Electronic Commerce Research	Journal of Theoretical and Applied Electronic Commerce Research	Sub Total
2000			24			24
2001			20			20
2002			23			23
2003			21			21
2004			26	5		31
2005		29	20			49
2006		26	21			47
2007		43	17			60
2008	13	26	18	21		78
2009	16	27	19	17		79
2010	18	44	20	21		103
2011	18	55	20	20		113
2012	18	43	16	25		102
2013	25	37	19	23		104
2014	25	34	15	23	18	115
2015	24	53	15	20	16	128
2016	21	41	21	15	10	108
Sub Total	178	458	335	190	44	1205

Distribution of Electronic Commerce Research Articles by Journals

Table 1 also reveals distribution of research articles by journals. The “International Journal of Electronic Commerce” was the first journal included in the SSCI database, following by the “Electronic Commerce Research and Applications” (since 2005), “Journal of Electronic Commerce Research” (since 2008), “Electronic Commerce Research” (since 2008), and “Journal of Theoretical and Applied Electronic Commerce Research” (since 2014). In 2004, there were five articles of the “Journal of Electronic Commerce Research” in the SSCI database. Nevertheless, there was no articles of the “Journal of Electronic Commerce Research” between 2005 and 2007 in the SSCI database. Most of the electronic commerce research articles were published in the “Electronic Commerce Research and Applications” (458 articles), following by “International Journal of Electronic Commerce” (335 articles), “Journal

of Electronic Commerce Research” (190 articles), “Electronic Commerce Research” (178 articles), and “Journal of Theoretical and Applied Electronic Commerce Research” (44 articles).

Distribution by Authors’ Countries

Table I reveals distribution of authors’ countries of the 1,205 electronic commerce studies. Based on author affiliations, the study identified countries producing the most electronic commerce publications among the period between 2000 and 2016. The five most prolific countries in electronic commerce research were USA (37.26%), Taiwan (14.69%), China (14.44%), South Korea (8.63%), and Germany (5.15%). Scholars of USA, Taiwan, China, South Korea, and Germany played important roles and were interested in electronic commerce research.

Highly Influence Electronic Commerce Research Articles

Table 3 reveals the highly influence electronic commerce research articles. As Table 3 revealed, there were 21 electronic commerce research articles that received more than 100 citations. The article published by Pavlou (Pavlou, 2003) in 2003 receive 634 citations. Articles published by Lee and Turban (M. K. Lee & Turban, 2001) in 2001 received 339 citations. Park, Lee, and Han (Park, Lee, & Han, 2007) in 2007 received 274 citations. McKnight and Chervany (D Harrison McKnight, 2001) in 2001 received 266 citations. These 21 highly influence articles were published in International Journal of Electronic Commerce (17 articles) and Electronic Commerce Research and Application (4 articles), since these two journals were the first two journals which were included in SSCI database.

Theoretical Background of Electronic Commerce Research

Keywords of academic articles can help others find the articles quickly and accurately. Most, if not all, journals request authors to provide some keywords for their journal articles. These keywords are usually highly relevant to the focus of research articles. Thus, some articles include the used theories in the keyword list. The current study check all the keywords of the 1,205 electronic commerce research articles to find out the theoretical background of these electronic commerce research. Based on the review of keywords, we obtained the theories use in the electronic commerce research articles, as Table 4 indicates. Some theories used the term of “model” or “law” instead of “theory”. The theories without the term of “theory” in their theory names are still included in the list. However, no all keywords which contain the term “theory”, “model” or “law” are included in the theory list. For

examples, the keywords of “theory development”, “business model”, “copyright law” are not name of theory. In addition, the list in the Table 4 does not include the theories/model relative to algorithm and theories used for data analysis. We check the terms one by one to make sure the list in the Table 4 are theories.

Not all authors would include the used theories in the keywords since most journals only allow authors to provide no more than five or ten keywords for their articles. Thus, the Table 4 does not include all theories included in the electronic commerce research. Nevertheless, the Table 4 is still useful since that it can serve as a reading list for novices in electronic commerce research.

Table 2 Electronic Commerce Publications by Countries

Countries	Articles	Percentage (% of 1,205)
USA	449	37.26%
Taiwan	177	14.69%
China	174	14.44%
South Korea	104	8.63%
Germany	62	5.15%
Canada	56	4.65%
Australia	54	4.48%
England	50	4.15%
Spain	49	4.07%
Netherlands	41	3.40%
Singapore	34	2.82%
Greece	28	2.32%
Italy	24	1.99%
Finland	19	1.58%
Belgium	17	1.41%
India	17	1.41%
Switzerland	17	1.41%
New Zealand	15	1.25%
Turkey	15	1.25%
France	12	1.00%
Iran	11	0.91%
Japan	11	0.91%
Denmark	10	0.83%

Notes: Countries with more than 10 articles are listed.

DISCUSSION

The current study presented a bibliometric study of electronic commerce research articles published in five top tier electronic commerce research journals listed in the SSCI database. The current study collected 1,205 electronic commerce research articles in the period of 2000 to 2016. We summary the highly influence electronic commerce research and the theoretical background of the electronic commerce research.

Even though the current study offered informative insights into the knowledge structure of electronic commerce research, it has some limitations. First, we include only articles published in the top tier electronic commerce journals listed in the SSCI database, which might influence the generalization of the study. Some electronic commerce research articles were published in the top tier journals of the fields of business, management information systems, computer science, information science, management, and marketing. Many high quality and high influence electronic commerce research articles were not included in our research scope. Besides, the current study only review the keywords of articles to find out the theoretical background of the electronic commerce research. Many articles did not provide their used theories as keywords. Thus, the theories for electronic commerce research are not all included in the list we summarized.

However, we still trust the study provides a valuable integration and different perspective on electronic commerce research. We believe that the current study would provide a useful briefing for newcomers of the field.

Table 3 Highly Influence Electronic Commerce Research Articles from 2000 to 2016

Authors	Year	Article Title	Journal	Cited Times
Pavlou (Pavlou, 2003)	2003	Consumer acceptance of electronic commerce: Integrating trust and risk with the technology acceptance model	IJEC	634
Lee and Turban (M. K. Lee & Turban, 2001)	2001	A trust model for consumer Internet shopping	IJEC	339
Park, Lee, and Han (Park et al., 2007)	2007	The effect of on-line consumer reviews on consumer purchasing intention: The moderating role of involvement	IJEC	274
McKnight and Chervany (D Harrison McKnight, 2001)	2001	What trust means in e-commerce customer relationships: An interdisciplinary conceptual typology	IJEC	266

Table 3 Highly Influence Electronic Commerce Research Articles from 2000 to 2016
(Continued)

Authors	Year	Article Title	Journal	Cited Times
DeLone and McLean (Delone & Mclean, 2004)	2004	Measuring e-commerce success: Applying the DeLone & McLean information systems success model	IJEC	260
Tsang and Liang (Tsang, Ho, & Liang, 2004)	2004	Consumer attitudes toward mobile advertising: An empirical study	IJEC	193
Lee (M.-C. Lee, 2009)	2009	Factors influencing the adoption of internet banking: An integration of TAM and TPB with perceived risk and perceived benefit	ECRA	168
Suh and Han (Suh & Han, 2003)	2003	The impact of customer trust and perception of security control on the acceptance of electronic commerce	IJEC	157
Hennig-Thurau and Walsh (Hennig-Thurau, Walsh, & Walsh, 2003)	2003	Electronic word-of-mouth: Motives for and consequences of reading customer articulations on the Internet	IJEC	149
Cheung, Luo, Sia, and Chen (Cheung, Luo, Sia, & Chen, 2009)	2009	Credibility of Electronic Word-of-Mouth: Informational and Normative Determinants of On-line Consumer Recommendations	IJEC	146
Westland (Westland, 2010)	2010	Lower bounds on sample size in structural equation modeling	ECRA	133
Lee, Park, and Han (J. Lee, Park, & Han, 2008)	2008	The effect of negative online consumer reviews on product attitude: An information processing view	ECRA	132
Zwass (Zwass, 2010)	2010	Co-Creation: Toward a Taxonomy and an Integrated Research Perspective	IJEC	121
Koh and Kim (Koh, Kim, & Kim, 2003)	2003	Sense of virtual community: A conceptual framework and empirical validation	IJEC	112
Barnes and Vidgen (Barnes & Vidgen, 2001)	2001	An evaluation of cyber-bookshops: The WebQual method	IJEC	111
Balasubramanian and Mahajan(Sridhar Balasubramanian, 2001)	2001	The economic leverage of the virtual community	IJEC	111

Table 3 Highly Influence Electronic Commerce Research Articles from 2000 to 2016
(Continued)

Authors	Year	Article Title	Journal	Cited Times
Rust and Lemon (Rust & Lemon, 2001)	2001	E-service and the consumer	IJEC	106
Park and Kim (Park & Kim, 2009)	2008	The effects of consumer knowledge on message processing of electronic word-of-mouth via online consumer reviews	ECRA	104
Koufaris, Kambil, and LaBarbera (Koufaris & Ajit Kambil, 2001)	2001	Consumer behavior in Web-based commerce: An empirical study	IJEC	100
Kauffman and Walden (Kauffman & Walden, 2001)	2001	Economics and electronic commerce: Survey and directions for research	IJEC	100

Notes: Cited times were search results of SSCI database in January 5, 2017. ECRA: Electronic Commerce Research and Applications, IJEC: International Journal of Electronic Commerce.

Table 4 Theories Mentioned in Electronic Commerce Research Articles from 2000 to 2016

3M Model of Motivation And Personality	Flow theory	IS Success Model	Recency, Frequency, and Monetary Model
Adverse Selection	Gibrat's Law	Pareto Law	Social Identity Theory
Anchoring Effect	Goal Gradient Theory	Percolation Theory	Social Justice Theory
Attribution Theory	Graph Theory	Perspective Model	Stimulus-Organism-Response (S-O-R) Model
Auction Theory	Grounded Theory	Persuasion Theory	Status Quo Bias Theory
Clustering Theory	Growth Theory	Prospect Theory	Strategic Fit Theory
Cognitive Fit Theory	Heuristic-Systematic Dual-Processing Model (HSM)	Protection Motivation Theory	Structuration Theory
Collective Cognition Theory	Homophily Theory	Reed's Law	Systems Theory
Decision Theory	Information Cascade Theory	Reputation- and Trust-Based Model (RTM)	Technology Acceptance Model (TAM)
Decomposed Theory of Planned Behavior	Innovation Diffusion Theory	Resource-Based Model	The Unified Theory of Use and Acceptance Of Technology (UTAUT)

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