

Analyzing the Academic Research Trends by Using University Digital Resources: A Bibliometric Study of Electronic Commerce in China

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Abstract Technology plays a vital role in every field of life especially in business and education. Electronic commerce (EC) begins in the year of 1991 right after internet was introduced for commercial use [1]. It is known to be the 12th five years' plan (2011 to 2015) of Chinese Ministry of Industry and Information Technology. The main *objective* of this study is to highlight the latest academic research trends on different topics or themes of EC in China by using university digital resources that is digital library. In order to obtain these latest academic trends, we have conducted bibliometric study and collected data from digital library for last six years i.e. from 2010 to 2015. The main *motivation* to choose this research topic and China was the worldwide reputation of this country, as top EC country in the world due to its high number of online users, and also impact of five years' Chinese government EC plan and policy. So, due to these facts we have established our research questions related to EC research trends in China to explore the answer of our **Research Question:** *What are the latest research trends in the field of electronic commerce in China since 2010?* As we wanted to know the answer thus we collected data through digital library and analyzed them fully to get a brief outlook about this EC trend. Result showed that a lot of research was already conducted on EC topics in China on different themes during the said duration. We can conclude that, this research trends showed that EC is a potential research field in China due to government five year EC policies or plan and to promote IT culture in Chinese society. This research provides guideline to the government IT policy makers and also academia researcher to be more focused on few topics or themes, where China is lacking behind, as leading EC country in the world.

Keywords Academic, Education, Research Trends, Digital Resources, Business, Electronic Commerce, E-commerce, China

1. Introduction

In modern era, governments in both developed and developing countries trying to adopt information and communication technologies (ICT's) by doing some reforms in their ICT policies related to business and education. From last few decades, it has been notice all around the world that most of the research universities and colleges are now focusing on adoption of latest technologies. So, they can improve quality of education and help their students by providing access of digital resources which contributes in the field of educational research. By achieving latest technologies, all stakeholder get benefits from it such as government, universities, and society. According to the 2014 UN e-government survey, population wise China is the first largest country in the world as for e-government it is ranked 70 worldwide and eighteen out of twenty countries in Asia [2].

The world's largest traditional library in United States has 120 million manuals (in form of paper) resources in more than 460 different languages. Digitalization of resources is very new concept and has short history. The concept of future digital resources was introduced in 1965, and that time it was predicted that in future digital resources will be very innovative, its access and application also different as compare to traditional resources for example traditional libraries. Academic research literature has an evidence about development of digitization of processes. Digital resources or e-resources is evidence of it. In 1990s, researcher explore new field related to digitalization of resources [3]. First example of digitization of resources is the first ever project was started to convert manual or print resources to digital one. Vatican Library Accessible World is prime example. For digitalization of Vatican Library, three partner organizations from Brazil, Italy and USA were involved to

digitize all collection of printed papers and books [4].

Digital resources facilitate the users to access resources electronically through internet [5]. Especially research community is the largest user of digital resources. Along with usage research from IT field are also contributing in it. The purpose of contribution is improving the speed and easy to access from different location such as work or home. According to some scholars, digital resources has only one that is online which only make difference as compare to traditional or manual resources [6]. Online or digital resources are the combination of other digital resources which are connect through network and have digital form of data i.e. articles and e-books which facilitate users to access digital form of data from different [3, 7].

Electronic commerce (EC) begins in the year of 1991, right after internet was introduced for commercial use [1]. EC was based on the web-based information technologies to computerize business processes including transaction, work flow, buyers, sellers, products information and services through computer based network. Rapid development in ICT and EC facilitates customers to use online services and purchase new goods [8]. EC is on the 12th five-year plan (2011 to 2015) of Chinese Ministry of Industry and Information Technology with a goal to make China an e-commerce global leader. China is the largest e-commerce country in the world according to the total number of online user. In the end of 2013, users of internet in China quickly approached to 600 million, a high trend of internet usage is being observed in recent past year in China and this pattern is expected to increase to 75% till 2015, perhaps enabling factors if not properly given due attention, may not reach desired goals. In China 55% of internet users pay through mobile and by 2015 e-business transactions in China and projected to hit USD 540 billion. Four main factors of EC growth in China comprised of EC, social media, digital payments and mobile devices [9-11]. Geographically China is the important country for analysis of EC development in term of business and emerging market and rapidly growing economy. It is important to identify the key business factors during transformation and also proper planning or strategy of available resources in business [12]. EC led development of economy is the part of vision of the Chinese government which will foster efficiency and boost economic development [13]. According to Benbasat et al. [14], nine main research topics in the field of electronic commerce (EC), those are 1) strategic issue 2) Assessment/ valuation 3) organizational transformation and societal issue 4) Adoption issue 5) Theory and methodology 6) Marketing and CRM issue 7) Technical issue 8) Security and legal issue, and 9) Logistics/ Operations.

1.1. Motivation and Objective of the Study

From last few years, mode of education research has been change and now the traditional university research education is moved to modern one that is university digital resource.

Due to these changes, all academic research scholars are using digital resources (university digital libraries) to get latest information about new research fields and trends. It is also being noticed that a lot of research studies related to education, information technology, social and management sciences are based on literature reviews. The purpose of these studies is to find the literature gap and fill it by using new tools and techniques and also to explore new emerging field of studies as well. According to Lei et al. [15], a large number of studies has been conducted in Chinese language about e-commerce in China based on systemic literature review. There is no specific in-depth systemic literature based study is conducted on E-commerce in China to highlight the Chinese government last 12th five years' plan and its effects. The motivation to choose EC academic research trends topic and China was the reputation as top EC country in the world due to high number of online users to sale and purchase their goods through interne and also impact of five years' Chinese government EC plan. A large number of studies has been conducted on e-commerce in general and more specifically published in (English language) foreign journals [15]. The main objective of this bibliometric study is to highlight the effects of Chinese government policies on e-commerce by exploring through university digital resources to find out latest academic research trends of EC towards development, adoption and acceptance in China. So, due to these changes we have established our research question related to EC educational research trends in China to explore the answer of our **Research Question:** *What are the latest educational research trends in the field of electronic commerce in China since 2010?* through university digital resources based literature review of last five year (from 2010 to 2015).

2. Research Methodology

For this study, we have conducted literature review because it provides important information about research areas, especially helps in the theory development and also research gaps where more work is required [16]. Before conducting any literature review, brainstorming, formation of keywords, searching material on internet (scientific search engines) and databases, time duration (period) for data collection are important elements [16-18]. During literature review, data can be analyzed of three or four year times [19]. So, we collected and analyzed all data from 2010 to 2015. According to Li et al. [20], there are four important steps to carry out any literature review 1) define paper inclusion/ exclusion criteria, identifying the research domain and choose specific keywords for searching, 2) searching and refine the sample collected through available 3) analyze the text material according to selected study and 4) for representation and categorize and structure the data for review and should be rigor and relevance [20, 21].

We have chosen keywords from Benbasat et al. [15]

research topics in electronic commerce (EC) for our research studies. After selection of keywords, we made a combination of these keywords with 'electronic commerce', 'e-commerce', 'China' including Benbasat et al. [15] research topics as a keyword during search of data within science technology and social science domain as given in figure 1.

2.1. Data Collection and Analysis Process

After finalizing the research topic, we have established our research question and then design data collection process model. Data collection process model is known to be used for collecting data on databases. Figure 1 showed that research question is linked with brainstorming whereas brainstorming is linked with both research question and formation of keywords. After the formation of keywords, we started data collection or information gathering from University databases.

During data collection, first we selected research domain that was science technology, and social sciences. After that we select time period (starting and ending year), and then enter different combination of keywords. By the combination of different keywords, we get outcome in the form of published papers in different journals and conferences during the period of 2010 - 2015.

For this study, we collected/search data related to our research question from digital library databases. We used Google scholar for our initial concepts related to selection of research topic and question. For, data collection we used university digital resources that is Web of Science database because it contains journals and conference papers of science technology and social sciences domain.

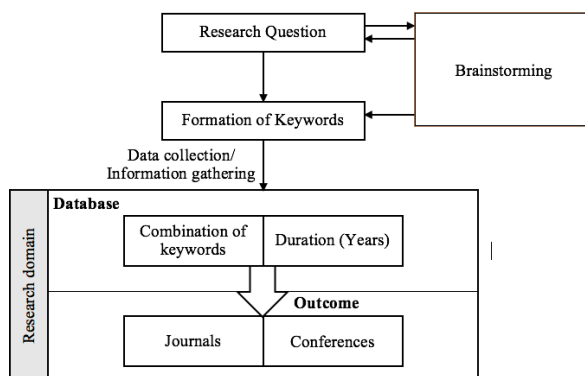


Figure 1. Data collection process model [16, 17]

Our paper selection criteria for this study was to select only those articles which are published in journal and conference and also listed in Web of Science database within period of 2010 to 2015. By using clustering and theory creating method of Grönlund and Andersson [16, 21], we wrote all themes mentioned in selected articles (from both journals and conferences) and then we grouped them with respect to each main topic. For analysis of the academic

research trends, categorize and structure data for review [20]. So, we categorized all collected data in tabular form which represents main topic and also trends related to publications both type-wise (journal of conference) and also year-wise as well.

3. Results and Discussion

After data collection and analysis of collected data, result showed that a lot of academic research was conducted on EC topic in China on different themes since 2010. Academic research trends on different domain of e-commerce demonstrate that still more work is required to improve e-commerce in China by carrying out more studies on marketing and CRM, transformation, valuation, security and privacy issue. In recent days, these are very important research topics to improve quality of e-commerce services and also ensure to security of online personal data. As show in Table 1, total number of papers published (2010 - 2015) on EC theme in context of China are 447 on 13 different research topics. The list of different e-commerce research themes is listed below:

3.1. Strategy Issues

Academic researches, are based on strategy issue in e-commerce to cover the inadequate infrastructure, information leakage, transaction fraud related to online payment, security technology, corporate social responsibility, telecommunication and m-commerce companies in formation marketing [22-24].

3.2. Adoption Issue

Issues to adopt e-commerce in China are limited infrastructure of internet, language barrier, electronic payment issues, industrial structure and irregular business processes, customer behaviour, unproven technology (such as information errors), and quality improvement of financial information are core issue in adoption of electronic commerce [25-27].

3.3. Theory and Methodology

From collected data, it has been noticed a list of theories and methodologies used for electronic commerce research. Such as:

Theory: "Social capital theory and social network theory".
Method: "Large data set collected from an e-commerce platform" [28].

Theory: "Customer satisfaction theory, information and decision making theory and self-efficacy theory".
Method: "Questionnaire and partial least squares structural equation modelling" [29].

Theory: "Grounded in traditional technology adoption and information diffusion theories".
Method: "Exploratory research approach, including interviews and further

analysis from published sources” [24].

Theory: “Information systems success theory, the technology acceptance model, and trust theory as theoretical bases”. Method: “Questionnaire survey, the structural equation modelling technique” [30].

3.4. Technical Issue

In China, technical issues in the field of e-commerce are integrity and security issues, transaction platform, web-based marketing, logistics, payment, and technical support [31-34].

3.5. Security and Legal Issue

Security and legal are also critical in the field of e-commerce such as cybercrime and security, trade issues, transmission of information through technology and construction of security systems, safe and convenient application environment, information security including data encryption, authentication and firewall technology, and also legal protection measures [35-37].

3.6. Marketing and CRM Issue

It is emerging research topic in e-commerce and the list of issues related to e-commerce are e-supply chain capability, e-CRM, performance and process of co-creating business value [38].

3.7. Logistics

Logistics is one of an important and key element of e-commerce. Literature shows that in-depth is already been done on this topic such as service level and overall cost, RFID technology, logistic time, third party logistics (3PL) enterprises, develop transportation standardization, integration and networking, and propose new requirements for freight background operation mode, logistics service quality, e-commerce logistics evaluation system, e-commerce logistics distribution system, new logistics mode (fourth-party logistics management), logistics alliance platform to improve speed of produce transportation of specific improvement strategy, regional logistics informatization, lack of socialization, supply of particular logistics, demand and capacity by modern logistics industry development, logistics integration of e-market and key technologies, building collection and delivery point (CDP), logistics inventory and automation operation based on RFID technology, poor infrastructure, low level IT, high cost of logistics distribution, and management personnel shortage, third party e-commerce platform (super-business center concept includes e-trading market, third party guarantees payment, and third party logistics) [39-55].

3.8. Operations

Lack of customer information, price plans, sales, management, product data, regulate EC market environment and promote its healthy operation, electronic system of

distribution (ESD), business operations and internal management provides high quality of services to the customer, information sharing for demand-side supply, transport integrated with operation, employed OLAP technology for improvement of management and logistic industry [24, 56-58].

3.9. Assessment

Online auditing performance assessment, enterprise e-commerce evaluation index system, fuzzy cluster analysis, fuzzy comprehensive evaluation methods, strategy of green marketing, information serving, transaction processing, supporting technology and website operation, personal credit assessment [55, 59-61].

3.10. Social Issue

In China, social issues related to e-commerce are information seeking, expressive, and sharing, and social interaction, stronger influence on consumers’ social commerce intentions, consumers’ adoption and networking services, social information browsing, social development [23, 62, 63].

3.11. Transformation Issue

Transformation faces issue in e-commerce are supply chain management, optimum use of all resources [64].

3.12. Organization Issue

Political, culture, human capital, technology issues include cyber-security, knowledge dissemination, advancement, sharing deals, and generation [37, 65].

Table 1. EC in China research themes during data collection (from 2010 to 2015)

Keywords	Result
Strategy issue	25
Adoption issue	14
Theory and methodology	20
Technical issue	09
Security and legal issue	07
Marketing and CRM issue	02
Logistics	157
Operations	123
Assessment	32
Valuation	05
Social issue	34
Transformation issue	02
Organization issue	17
Total	447

Research trends also showed that during selected period of time most of the academic research was conducted on logistics and operation themes with 157 and 123 papers

respectively whereas less number of researches was conducted on Marketing and CRM and transformation issues as shown in Table 1. Year-wise 118 papers published in both conference and journal during 2010 which attained maximum number in that year, whereas less number of papers published in 2015 which was 4.

Table 2 shows that high number of publications are 39 on logistics in 2013, and 0 is the lowest number of publications in many themes such as strategy (2015), adoption (2015), technical (2015), security and legal (2012, 2014 and 2015), marketing & CRM (2010, 2011, 2012, 2013, and 2015), social (2015), transformation (2011, 2012, 2013, 2014, 2015), and organizational issue (2015); theory and methodology (2015); assessment (2015); valuation (2011, 2014, and 2015).

Table 2. Year wise EC in China research themes during 2010 to 2015

Year Keywords	2010	2011	2012	2013	2014	2015
Strategy issue	7	3	9	5	1	0
Adoption issue	1	4	2	2	5	0
Theory and methodology	7	3	2	7	1	0
Technical issue	4	2	1	1	1	0
Security and legal issue	1	4	0	2	0	0
Marketing and CRM issue	0	0	0	0	2	0
Logistics	33	27	26	39	30	2
Operations	36	28	27	24	6	2
Assessment	13	7	6	3	3	0
Valuation	1	0	2	2	0	0
Social issue	5	12	9	4	4	0
Transformation issue	2	0	0	0	0	0
Organization issue	8	1	3	2	3	0

Maximum number of papers published in conference i.e. 294 as compare to journals i.e. 153 during last five years with percentage of 66% in conference and remaining 34% in journals as showed in table 3 and 4 respectively.

Table 3. Percentage wise list of published papers related EC in China research themes during 2010 to 2015

Conference	Journals
66%	34%

During search, 91 papers were found which was published in 2010 and only 4 papers were published in the year of 2015 and in case of journal maximum papers found during 2013 with total number of 62 and less number of papers are '0' in 2015.

Table 4. Year wise list of published papers related EC in China during 2010 to 2015

#	2010	2011	2012	2013	2014	2015
Conference	91	74	52	29	44	4
Journal	27	17	35	62	12	0

Every year a large number of academic conferences are arranged by Chinese universities with sponsors of some well renowned publishers such as IEEE. The purpose of these conferences is to gain revenue and also provide platform to Chinese research scholars to bring their innovative ideas in the form of conference papers. These conference papers highlighted the latest Chinese research academic topic and also published as conference proceeding under the flagship of publishers and university as an organizer. For publication in journals, Chinese university scholars are not fluent in English language due to most of the university higher education programs and also research is in Chinese language. Due language barrier and also strict criteria of journal peer review process effects on publication as well.

Overall objective of this paper is only to highlight the trends of academic related to e-commerce during 12th five years' Chinese government plan. In this research studies, we will not cover influence factors which effects on e-commerce related topics in China. Although according to academic research trends of collected data shows that some themes/topics are newly emerge related to e-commerce, which is the main reason for lacking behind with compare to others topics.

4. Conclusion

We can conclude that most of the academic research work related to electronic commerce in China has been published on logistics topic and least number of researches was found to be on marketing and CRM issue, and transformation issue from last six years is available on university digital resources. So, digital resources based studies is helpful in analyzing academic research trends. This type of research study provides guidelines to the Chinese government IT policy makers to promote IT culture in a society and to focus on the few areas where research shows that government need to adopt upcoming new IT policy. For keep EC top ranked country in the world, Chinese government need to work on valuation; security, legal, strategy and adoption issue.

4.1. Limitations

The aim of the study was to identify and highlight the EC research trends in China from Chinese government IT policy and five years' plan through university digital resources. So, for this study we collected data related to list of themes or topics and analyzed according to our main research topic. The limitation of this study was the limited scope of our research. Furthermore, if we have more time then we can expand our duration of data collection from five years to ten

years. So, this will give us the clear scenario of EC research trends and its rapid development and acceptance in China.

4.2. Future Work

This study highlights the research trends in the field of EC in China, and also gives guideline to Chinese government IT policy makers and academia researchers to consider different areas where EC is lacking behind. Anyone can do further extend this research as EC research policy in China and EC research trends in both developed and developing countries in context of challenges and opportunities.

Appendix

Combination of keywords during searching data (from 2010 to 2015)

Keywords	Result
Electronic Commerce + Strategy + issue + China	10
E-Commerce + Strategy + issue + China	15
Electronic Commerce + adoption + issue + China	6
E-Commerce + Strategy + issue + China	8
Electronic Commerce + Theory and Methodology + issue + China	5
E-Commerce + Theory and Methodology + issue + China	15
Electronic Commerce + technical + issue + China	1
E-Commerce + technical + issue + China	8
Electronic Commerce + Security + legal + issue + China	4
E-Commerce + Security + legal + issue + China	3
Electronic Commerce + Marketing + CRM + issue + China	1
E-Commerce + Marketing + CRM + issue + China	1
Electronic Commerce + logistics + China	56
E-Commerce + logistics + China	101
Electronic Commerce + operations + China	46
E-Commerce + Operations + China	77
Electronic Commerce + Assessment + issue + China	5
E-Commerce + Assessment + issue + China	27
Electronic Commerce + Valuation + China	1
E-Commerce + Valuation + China	4
Electronic Commerce + Social + issue + China	16
E-Commerce + Social + issue + China	18
Electronic Commerce + transformation + issue + China	1
E-Commerce + transformation + issue + China	1
Electronic Commerce + organization + issue + China	5
E-Commerce + organization + issue + China	12
Total	447

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