

Mobile Payment and e-Wallet Research: A Bibliometric Analysis

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ABSTRACT

The topic of mobile payment and electronic wallet has been a rising topic since 1984. Since 2003, many scholars are being actively producing articles pertinent to this topic. Most of the articles have been published in journals, and primary language used for research is English. Objective of this paper is to investigate mobile payment and electronic wallet through bibliometric analysis. Sources of publication, authorship, citations, distributions publications and other bibliometric indicators are also analyzed in this paper. This study is focused on a total of 1348 published articles between 1984 and 2021. The articles have been automatically collected through a process from the established Scopus database and then later analyzed with bibliometric indicators analysis techniques. Since 1984, the topic of mobile payment and electronic wallet has been emerged. Beginning in 2003, many articles pertinent to this topic have been actively producing by the scholars. Journals is where most of the articles were published in, and English is the main language used in their publications. China leads other country in publications contribution. In the meantime, the most significant areas in which the sources have been produced were Computer Science, Business, Management & Accounting, Engineering, Social Sciences, Economics, Econometrics and Finance, Decision Sciences, and Mathematics. Though, there are still some limitations were found. For future research, we proposed to lengthen this work to other databases by adding a new keyword such as e-money, as well as bibliometric analysis of mobile payment and electronic wallet in developed and developing countries. This paper presents the latest trends in expansion of academic literature on mobile payment and electronic wallet that uses the bibliometric analysis method. Bibliometric indicators are being used in this paper to present the results.

Keywords: Mobile Payment, e-Wallet, Bibliometric Analysis, Scopus.

1. INTRODUCTION

The vibrant of financial technology eco-system has enabled the seamless adoption of cashless transactions, be it e-payment or e-wallet, especially when most countries imposed the movement control order (MCO) was to control the COVID-19 pandemic. Main benefit of mobile payment is the reduction in cost of handling cash and peace of mind for both consumers and sellers while carrying out their transactions. In addition, it also increases transparency, and mobile payment also offers better access to data for financial management as it lets you track financial activity in real-time as well as improved earning trackers. The purpose of this study is to investigate the latest trends in the development of scientific literature on mobile payment and electronic wallet using the bibliometric analysis methodology.

2. LITERATURE REVIEW

A digital business uses technology in its internal and external operations as an advantage. Since the internet became widely available to businesses and individuals, information technology has changed the infrastructure and operations of businesses. The way companies conduct their day-to-day operations has changed this transformation profoundly. The benefits of data assets and technology-focused programs have thus been maximized.

Cashless Transaction

Due to the growth of the digital business, there are many cashless payment options in doing business. This has paved the way to the hassle-free digital payment solutions. Internet banking for instance has enabled users

to do financial transactions and operations via internet (Baabdullah et al., 2019; Geebren et al., 2021). Users may also use the bank's mobile applications to connect to their bank account and perform transactions at no extra cost. The instant transaction of banking services through the internet saves a lot of time and resources.

Since the booming of the internet banking, many payment channels were created for the benefit of the customers including the payment gateway which bridging the bank and the platform where people buy things. The payment gateways make the transaction possible through many electronic devices. Furthermore, a payment system is supposed to protect customer's financial information from being compromised by sending it directly to a payment gateway rather than sending through a merchant (Oo, 2019).

Mobile Payment

On the other hand, mobile payment instead is defined as that method of monetary transaction which involves electronic devices such as smartphones and tablets. The mobile payment market and applications users is rising worldwide. The mobile payment market size was valued at USD 31.5 billion globally in 2020 and is projected to grow at a compound annual growth rate (CAGR) of 31.8% from 2021 to 2028 (Grand View Research, 2021). In Malaysia, there are some mobile payment systems that consumers may choose from. Some examples of the established mobile payment gateways in Malaysia are MAE by Maybank, Mobile88, Touch & Go e-wallet, Boost and many more (Nielsen Syndicated Studies, 2018).

The Malaysia Financial Sector Blueprint has been launched by Bank Negara Malaysia in 2010 which aims to roll out policy initiatives from 2011 until 2020 to increase mobile transactions in Malaysia (Shairil Izwan & Yusoff, 2017). Mobile transaction system is currently aligned towards a cashless economy as more people have started to accept cashless transaction (Minderjeet, 2017). This mobile payment has benefited from the revolution in mobile technologies.

The transactions in those gateways are cashless yet secured by some security algorithm implemented by the system developers. Despite being moderate in e-commerce sector, Malaysian consumers have been swift to adapt to mobile payment earlier in comparison with major markets like the U.S. and UK. In a report by J.P. Morgan, (2019), roughly 62 percent of smartphone users use their devices to do online purchasing and 47 percent of all e-commerce transactions were done through mobile devices (J.P. Morgan, 2019). The value of shopping over mobile devices is expected to expand at a compound annual growth rate of 31.4 percent to 2021, to reach a value over RM23 billion (J.P. Morgan, 2019). Therefore, further research should be done to stand the factors on

usage, perception, adoption and so forth on user's confidence. Although mobile payment is simpler to use and less expensive than the more established technique (Sin et al., 2020), and the number of usages is on the rise, there is no assurance for the sustainable of this new technology.

The current covid-19 pandemic has as well introduced numerous changes in cashless transactions. The pandemic forced many people who normally used cash money to switch to digital payment methods — and this could be a lasting change. Wisniewski et al., (2021) in their works examine preferences regarding cash and cashless payments at the point of sale (POS) during the COVID-19 crisis.

3. METHODS

This paper is intended to evaluate the latest trends in the expansion of scholarly literature on mobile payment and electronic wallet using the bibliometric analysis methodology. Bibliometric indicators are being used in this paper to report the results.

Bibliometrics Analysis

Bibliometrics examines formal characteristics of knowledge domains using mathematical and statistical techniques (de Bellis, 2009). The bibliometric survey of this paper is to add to the existing bibliometric analyses of mobile payment by focusing on the overall intellectual structure of this knowledge domain through Scopus database.

This bibliometric study used 1,348 source documents identified by keyword search and combining the analysis of the citations among them, along with the citation and publication counts. Citation and publication counts are the two most basic bibliometric measures as stated by Martin & Daim, (2008).

These documents represent every mobile payment literature published in the various language between 1984 and 2021. More precisely, the literature containing the term "mobile payment" or the term "e-wallet," in the title stored in the Scopus scholarly databases.

Source and data collection

The Scopus database was utilized to extract the necessary data to present a bibliometric analysis. The most significant factor of Scopus is its ability to offer a direct and simple bibliometric indicators (Sweileh et al., 2018). Given the fact that the Scopus database is one of the most outstanding academic databases currently available, with approximately 1348 titles, this study employs the Scopus database as the primary source for data collection. The topical range of this review was delimited to 'mobile payment, electronic wallet, mobile wallet'. In operational terms, the authors followed

PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines for the document search as shown in figure 1 (Moher et al., 2010). A series of searches were carried out which used various combinations of following keywords string: TITLE-ABS-KEY ("mobile payment" OR "m-payment" OR "electronic wallet" OR "e-wallet" OR "mobile wallet" OR "m-wallet").

This Scopus searches generated a total of 1,348 documents (see Figure 1) and the search was conducted on October 10, 2021. There is no filtration involved on the list of 1,348 documents. Thus, the total of all 1,348 documents were analyzed comprehensively using bibliometrics tools namely Harzing Publish or Perish, and Microsoft Excel for further analysis.

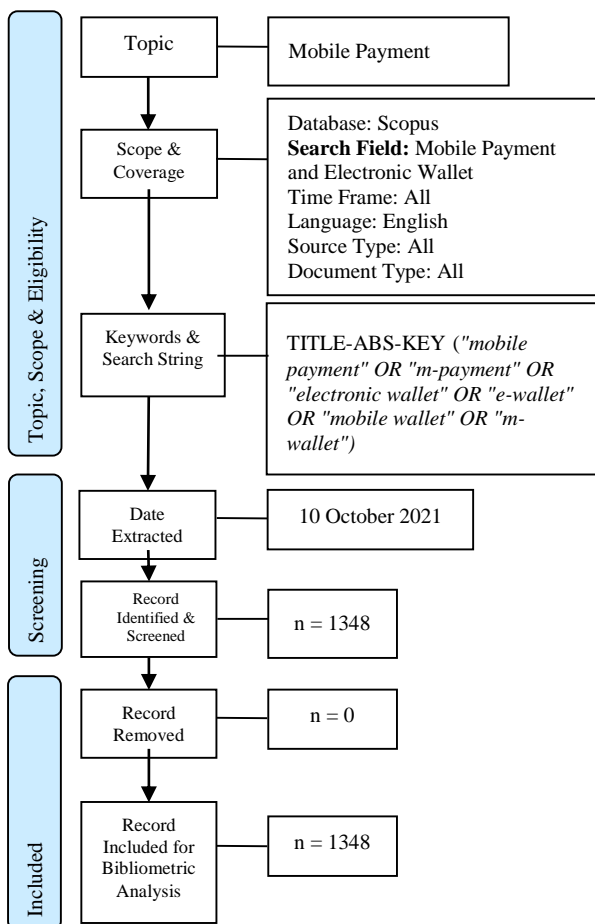


Figure 1 PRISMA Flow Diagram. Source: Adapted from Moher et al., (2010).

4. RESULT AND DISCUSSION

The analysis for the extracted academic work in the search process was based on the following attributes: research productivity, document and source type, the language of documents, subject area, distribution of publication by countries, most active institutions, authorship analysis, keywords analysis, and citation metric analysis.

Document Profile

Table 1 gives the number of publications distributed in ten different document types. Most documents were published as either article or conference paper which dominates by 92.28% of overall profiles. In term of document sources, 49.33% (665) were produced in journals, 36.87 in conference proceedings while the rest were in book series, book, and trade journal as shown in Table 2.

Collected data sets also were analysed to identify language used in the published documents. As shown in the table 3, the language used for publications on mobile payment and e-wallet are mostly in English with a total (97.78%). Interestingly, there were other languages used for quite some of the publications i.e., Chinese (18), German (4), Spanish (4), Turkish (2), French (1), and Portuguese (1).

Table 1. Type of documents

Document Type	TP	%
Article	636	47.18%
Conference Paper	608	45.10%
Book Chapter	59	4.38%
Review	20	1.48%
Note	11	0.82%
Book	5	0.37%
Short Survey	5	0.37%
Editorial	2	0.15%
Letter	1	0.07%
Retracted	1	0.07%
Total	1348	100.00%

Table 2. Document Source

Source Type	TP	%
Journal	665	49.33%
Conference Proceeding	497	36.87%
Book Series	123	9.12%
Book	54	4.01%
Trade Journal	9	0.67%
Total	1348	100.00%

Table 3. Languages

Language	TP	%
English	1321	97.78%
Chinese	18	1.33%
German	4	0.30%
Spanish	4	0.30%
Turkish	2	0.15%
French	1	0.07%
Portuguese	1	0.07%

Subject Area Analysis

Table 4 sums up the publications based on topic area. It shows that the largest number of publications were categorized under "computer sciences" with a total of 848 (62.91%) publications. Next comes "business, management and accounting" (29.67%), "engineering"

(26.93%), “social sciences” (13.87%) and “decision sciences” (10.39%) while “economics, econometrics, and finance” (10.16%). Other subject areas were below than 10% (each) of the total publications, including “mathematics”, “physics and astronomy”, “environmental science”, and “energy” at the top 10 of the table.

Table 4. Top-10 Topic Area

Subject Area	TP	%
Computer Science	848	62.91%
Business, Management and Accounting	400	29.67%
Engineering	363	26.93%
Social Sciences	187	13.87%
Decision Sciences	140	10.39%
Economics, Econometrics and Finance	137	10.16%
Mathematics	130	9.64%
Physics and Astronomy	36	2.67%
Environmental Science	35	2.60%
Energy	30	2.23%

Publication Year

Figure 2 shows the publication-year distribution. The publications were mostly produced (184) in 2020, followed by 152 publications in 2021, and 147 citations in 2019. The trend of publications had been increasing since 1984.

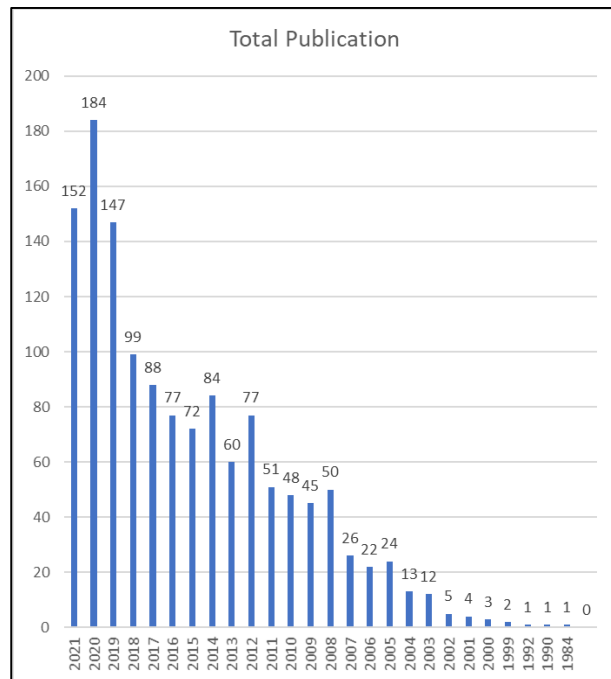


Figure 2. Years of Publications.

Top Producing Country

Overall, 76.85% (1036/1348) of the included papers were published from 10 countries, shown in Table 5. About 22.55% (304/1348) of the included studied were

from China. India was the next leading country (163/1348, 12.09%), followed by the United States (121/1348, 8.98%). A filled map of publications by country is shown in Figure 3.

Table 5. Top 10 Country Publication Contributions

Country	TP	%
China	304	22.55%
India	163	12.09%
United States	121	8.98%
Indonesia	92	6.82%
South Korea	75	5.56%
Malaysia	69	5.12%
Taiwan	61	4.53%
United Kingdom	57	4.23%
Germany	54	4.01%
Australia	40	2.97%

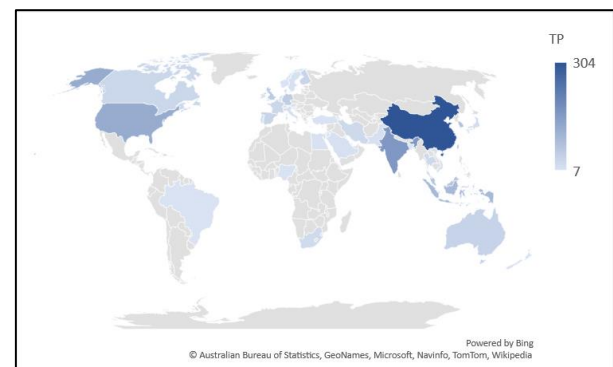


Figure 3. Filled Map of the Total 1348 Publications Produced by 41 Country

Authors Contribution

Table 6. Most authors

Author Name	TP	%
Liébana-Cabanillas, F.	19	1.41%
Ondrus, J.	15	1.11%
Gong, X.	12	0.89%
Zhang, K.Z.K.	12	0.89%
Lee, M.K.O.	11	0.82%
Muñoz-Leiva, F.	11	0.82%
Pousttchi, K.	11	0.82%
Sánchez-Fernández, J.	9	0.67%
Ahamad, S.S.	8	0.59%
Sastry, V.N.	8	0.59%
Dahlberg, T.	7	0.52%
Dwivedi, Y.K.	7	0.52%
Ooi, K.B.	7	0.52%
Pal, A.	7	0.52%
Pigneur, Y.	7	0.52%
Chawla, D.	6	0.45%
Joshi, H.	6	0.45%
Rabara, S.A.	6	0.45%
Singh, N.	6	0.45%
Tan, G.W.H.	6	0.45%
Tripathy, A.K.	6	0.45%

Table 6 present the authors contributes to the publications with the title consisted of mobile payment and e-wallet papers since 1984. Most contributed authors were Liébana-Cabanillas, F. (19), Ondrus, J. (15), Gong, X. (12), and Zhang, K.Z.K. (12). The rest of the authors have produced at least 6 papers each.

Most influential institutions

The most influential institutions in publishing mobile payment and e-wallet articles are presented in Table 7. The Bina Nusantara University (Indonesia) and the Beijing University of Posts and Telecommunications from China were the most influential institutions with 32 and 31 publications each. Universidad de Granada, Universitas Indonesia, City University of Hong Kong, Copenhagen Business School, Delft University of Technology lead the rest of the contributing institutions with less than 23 publications per institution.

Table 7. Most influential institutions

Institution	TP	%
Bina Nusantara University	32	2.37%
Beijing University of Posts and Telecommunications	31	2.30%
Universidad de Granada	23	1.71%
Universitas Indonesia	17	1.26%
City University of Hong Kong	13	0.96%
Copenhagen Business School	12	0.89%
Delft University of Technology	11	0.82%
Xi'an Jiaotong University	11	0.82%
Huazhong University of Science and Technology	10	0.74%
Universiti Tunku Abdul Rahman	10	0.74%
Aalto University	10	0.74%
University of Electronic Science and Technology of China	9	0.67%
Hong Kong Polytechnic University	9	0.67%
ESSEC Business School	9	0.67%
University of Science and Technology of China	9	0.67%
South China University of Technology	9	0.67%
UCSI University	9	0.67%
Facultad de Ciencias Económicas y Empresariales	9	0.67%
The Royal Institute of Technology KTH	8	0.59%
Universiti Utara Malaysia	8	0.59%
Zhejiang University	8	0.59%

Citation Metric

Table 8. Citations Metric

Metrics	Data
Papers	1348
Number of Citations	18247
Years	37
Citations per Year	493.16
Citations per Paper	13.54
Citations per Author	8230.31
Papers per Author	590.76
Authors per Paper	2.83
h-index	61
g-index	109

Table 8 presented the citation metrics for the retrieved documents for 37 years as of 12/10/2021. The software of Harzing's Publish or Perish has been used to find the citation metric for the extracted data from the Scopus database. The summary contains number of citations with their citations per year, citations per paper, and citations per author.

Altogether, there were 1348 papers with 18247 citations averaging at 493.16 citations per year of mobile payment and e-wallet publications. Each paper was cited 13.54 times, and the total of h-index and the g-index were at 61 and 109 for the entire publications.

Keyword analysis

Table 9. Top-20 Keywords used.

Keywords	TP	%
Mobile Payment	700	51.93%
Global System for Mobile Communications	581	43.10%
Electronic Money	474	35.16%
Mobile Telecommunication Systems	145	10.76%
Mobile Payments	143	10.61%
Electronic Commerce	141	10.46%
Mobile Payment System	131	9.72%
Mobile Commerce	127	9.42%
Mobile Devices	103	7.64%
Authentication	85	6.31%
Near Field Communication	85	6.31%
Security	76	5.64%
Cryptography	65	4.82%
Information Systems	62	4.60%
Surveys	62	4.60%
Trust	60	4.45%
Technology Acceptance Model	59	4.38%
Commerce	56	4.15%
NFC	55	4.08%
Technology Adoption	54	4.01%

We presented the major keywords in the development of mobile payment and e-wallet by analysing the list of top-15 keywords that had been published between 1984 and 2021, as seen in Figure 9. The main three keywords used by literatures in this study were mobile payment, global system for mobile communications and electronic money.

5. CONCLUSIONS

From the result presented, the publication concerning e-wallet gives a spike increment starting 2019. This pattern of the publication is probably due to the acceptance of the usage of e-wallet. Additionally, the pandemic of Covid-19 changes how people behave with the adoption and use of technology. The movement control order, for example, encourage online purchase, thus increasing the use of e-wallet.

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