Makale Türü/Article Type: Araştırma Makalesi/Research Article

25 YEARS OF DIGITAL PAYMENT SYSTEMS

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Abstract

This study aims to make a general map of the studies prepared in the 25 years since the first study on digital payment systems was carried out in 1997. In this study, which was designed to make a general map of the literature of digital payment systems, the journals in the WoS database and scanned in the SSCI were examined using the bibliometric analysis method. Keywords used in digital payment systems studies and references to these studies were mapped, and a general profile of the literature was taken. Visualization of scientific maps was carried out using the "VOSviewer" program to visualize the analysis results. In approximately 25 years since the beginning of the studies on digital payment systems in 1997, 1326 studies have been identified, and all these studies have been included in the analysis. According to these analyses, the studies published between 1997 and 2021 were categorized according to the country, the journal in which they were published, and their frequencies were determined according to the years. Since 2013, most studies have been carried out in China, the USA, and India on digital payment systems, which have gained increasing momentum. Mobile payments, security, trust, and mobile wallet keywords are especially notable in the studies of digital payment systems published frequently in technology and marketing journals. In this way, the studies on digital payment systems have been reviewed, and the results of the study are a guideline in terms of reaching the issues that have not been studied in terms of marketing literature.

Key Words: Digital payment system, mobile payment, bibliometric analysis

DİJİTAL ÖDEME SİSTEMLERİNİN 25 YILI

Öz

Bu çalışmanın amacı, dijital ödeme sistemlerine yönelik ilk çalışmanın yapıldığı 1997 yılından günümüze kadar geçen 25 yıllık süreçte hazırlanmış çalışmaların, genel bir haritasını çıkarmaktır. Dijital ödeme sistemleri literatürünün genel bir haritasını çıkarmak için hazırlanmış bu çalışmada, Web of Science veri tabanında bulunan ve Social Sciences Citation Index'te taranan dergiler bibliyometrik analiz yöntemi kullanılarak incelenmiştir. Yapılan inceleme sonucunda dijital ödeme sistemleri çalışmalarında kullanılan anahtar kelimeler ve bu çalışmalara yapılan atıflar haritalandırılarak literatürün genel bir profili çıkarılmıştır. Analiz sonuçlarının görselleştirilmesi için "VOSviewer" programı kullanılarak bilimsel haritaların görselleştirilmesi gerçekleştirilmiştir. Dijital ödeme sistemleri konusunda çalışmaların başladığı 1997 yılından günümüze kadar uzanan yaklaşık 25 yılda yayımlanmış 1326 çalışma tespit edilmiş ve bu çalışmaların tamamı analize dahil edilmiştir. Bu analizler sonucunda 1997-2021 yılları arasında yayımlanan çalışmalar, ülkeye ve yayımlandığı dergiye göre kategorize edilip, yıllara göre yoğunlukları belirlenmiştir. 2013 yılından itibaren artan bir ivme yakalayan dijital ödeme sistemleri konusunda en fazla Çin, ABD ve Hindistan'da çalışmalar yapıldığı görülmüştür. Özellikle teknoloji ve pazarlama dergilerinde sıkça yayımlanan dijital ödeme sistemlerine ait çalışmalarda mobil ödemeler, güvenlik, güven ve mobil cüzdan anahtar kelimeleri dikkat çekmektedir. Bu sayede, dijital ödeme sistemleri ile ilgili bugüne kadar yapılmış çalışmalar gözden geçirilmiş olup, çalışma sonuçları özellikle pazarlama literatürü açısından halihazırda çalışılmamış konulara ulaşılması açısından rehber niteliği taşımaktadır.

Anahtar Kelimeler: Dijital ödeme sistemleri, mobil ödeme, bibliyometrik analiz

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1. Introduction

Internet-based banking and shopping applications have grown increasingly common due to the increased usage of information and communication technology. This expansion has altered the market's structure and the people it serves, and their purchasing habits (Schaller, Vatananan-Thesenvitz, & Schaller, 2021). This process, which can be summarized as the evolution of consumption habits toward want rather than need and the rise of hedonic consumption, has caused consumers to reject the distribution options provided by businesses, and as a result, the popularity of e-commerce sites that are open 24 hours a day has risen in the market. This shift in traditional corporate structures accompanied a complicated market structure characterized by a wide range of individual behavior.

More than two billion people will have purchased goods or services online by 2020 in the world of electronic commerce, where the Internet is used to sell, buy, transport, or trade data and products with many stakeholders (Turban, Whiteside, King, & Outland, 2017). The global value of e-commerce has surpassed US$4.2 trillion (Statista, 2021a). With the COVID-19 pandemic causing people to turn to the Internet more regularly, the focus has shifted to online shopping (Hoang, Nguyen, & Nguyen, 2021). In the post-COVID-19 time, when the trend toward digitalization has intensified both in the consumer and commercial worlds, the ongoing shift to e-commerce, digital payments, and quick payments has grown dramatically (McKinsey, 2020). Another study looked at the number of visitors to e-commerce sites in the first four months of 2020. The number of visitors in April was 15.7 percent greater than the number of visitors in January (Statista, 2020a). Digital payment methods have become more widely used as a natural result of this growing trend in e-commerce usage. Digital payment systems are expected to grow from 950 million users in 2019 to 1.31 billion users in 2023 (Statista, 2020b), with benefits such as increased convenience, lower transaction fees, and improved electronic payment security (Bezovski, 2016). An essential concern for worldwide e-commerce is the increased usage of digital payment systems (Donnelly, 2016). In 2020, the global digital payments segment will have a transaction volume of $5.204 billion. China is the world's largest market for digital payments, with a market value of $2.496 billion (Statista, 2021b).

Because the flexible organizational structures are far from centralized, the new market structure has a heterogeneous system. Individuals of various qualities must make commercial judgments based on specific terms and situations, requiring a stable, efficient, and trustworthy infrastructure. In conditions where many decisions are made using various methods, an efficient, durable, and dependable infrastructure is needed to ensure that transactions are completed according to the terms and conditions agreed upon by their source counterparts (Bossone & Cirasino, 2001). These infrastructures are required in monetary units, just as in all other business units. As a result of shifting customer demands, trustworthy and technologically advanced payment systems were needed, and digital payment systems were born. The introduction of solid encryption protocols such as SSL, on the other hand, has boosted the market's reliability and functionality of digital payment systems. The term "FinTech" was coined by combining the English words "finance" and "technology" to describe an era in which the use of technology is unavoidable in financial transactions (Iman, 2018).

FinTech enables a wide range of financial technology to be employed in a rhythmic and immediate communication structure and to track financial transactions online with authorization constraints in a smooth manner. Financial information can be segregated from untrustworthy third parties and followed by users with access to the jurisdiction in this way (Ligon, Malick, Sheth, & Trachtman, 2019). The ability to instantly monitor financial transactions eliminates errors caused by the human component in cash-using system reconciliation.

The adoption of cell phones in financial transactions is another damaging event in the FinTech industry. Mobile payment has become a dominating type of digital payment, especially in industrialized nations, because of the widespread use of these devices for financial transactions worldwide (Maurer, 2012). The fundamental cause of the phenomena is the development of industrialized countries' mobile communication infrastructure and highly educated consumers' mobile payment systems (Jaradat & Faqih, 2014). Access to smartphones and technologies integrated into these phones can be offered more efficiently in industrialized countries. Even though infrastructural challenges exist in developing nations, it is clear that mobile payment systems are widely used due to the relative increase in the use of mobile technology (Setor, Senyo, & Addo, 2021).

Accessories that can be integrated into cellphones can now be used as a payment instrument due to digital and mobile payment systems development. Digital payments are predicted to be revolutionized by wearables such as smartwatches and the user experience that the Internet of Things (IoT) can provide (Şafak & Ünsal, 2021). However, introducing technology that enables internet connection and buying, such as smart speakers, will diversify digital payments. The fundamental dynamics of the projected revolutionization are the easy integration of mobile payment systems with intelligent products that facilitate daily life and the enjoyment structure of today's consumers waiting for instant change transformation. This revolution permits currency, which has already been digitized and emancipated, to be abstracted totally by moving to the next level, being user-friendly, and responding to the needs of a whole new consumer.

All of the factors above illustrate why digital payment systems were chosen as a topic worth researching. A powerful alternative technique to forecast digital payment systems and the mobile payment systems talked with them is to summarize the dimensions in which they are discussed and compile the findings of competent studies on the subject. Digital payment systems, which have been growing day by day for the last quarter-century, appear to have reached a tipping point with the pandemic issue, according to the literature. This research aims to provide a comprehensive map of the digital payment systems literature. The bibliometric analysis method assessed journals reviewed in the Social Sciences Citation Index published in the recent 25 years. It also aims to investigate certified academic publications on digital payment systems from a conceptual standpoint and identify sub-areas and gaps in the literature on which future research in this area can be concentrated. Furthermore, this research will reveal the historical development of the digital payment process and will be used to direct future research on the topic.

2. Conceptual Framework

Factors such as the introduction of blockchain technology and cold wallet applications, the growth of trade volume in the cryptocurrency market, particularly Bitcoin, and the proliferation of cryptocurrency trading and storage software have increased the importance of digital payment systems and drawn the attention of economic actors (Papadopoulos, 2015). Digital payment systems are a catch-all phrase for digital payment instruments, which are gaining popularity as a means of completing transactions in a variety of industries. They use a network of technology systems that comprises three sides of the payment system (bank, client, and business) to make transactions safe (Akanfe, Valecha, & Rao, 2020). Individual or business activities that employ a mobile internet-enabled electronic device to complete economic transactions are referred to as mobile payment systems (Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2014). According to Soejachmoen (2016), M-money systems can digitally access and activate electronic financial services using mobile phones.

Digital payment systems include many electronic transaction infrastructures. The digital payment methods that are widely used today can be listed as follows: Digital wallets (Pham & Ho,

2015), debit cards (Guan & Hua, 2003), pre-paid cards (Stroborn, Heitmann, Leibold, & Frank, 2004), credit cards (Chou, Lee, & Chung, 2004), e-cash (Chou et al., 2004), e-payments (Peha & Khamitov, 2004), mobile payment (Dahlberg, Mallat, Ondrus, & Zmijewska, 2008), QR code (Ramos de Luna, Liébana-Cabanillas, Sánchez-Fernández, & Muñoz-Leiva, 2019), bank transfer (WorldPay, 2021).

It will be easier to distinguish between the types of payments if the working logic of the payment tools that consumers use most frequently is explained. To begin with, a *digital wallet* is a piece of software that stores and transmits payment authorization data for one or more credit or bank accounts. When a consumer uploads payment account data to a digital wallet, the wallet can be used as a payment device for that account and transmits that data to the company for payment authorization (Levitin, 2018). *Debit cards* are a type of payment that necessitates the user having a credit limit on their account linked to the bill before making a purchase. The most significant benefit of using a debit card is that it eliminates the need to carry cash (Foscht, Maloles, Swoboda, & Chia, 2010). *Pre-paid cards*, another payment option, are often defined as a device that can save money for later usage. Gift cards, phone cards, transportation cards, and location-specific cards, such as university-issued cards accepted solely on campus, are now included in this broad category of prepaid cards (Hitczenko & Tai, 2014). Finally, *credit cards* are a payment type that allows customers to buy something or get something done right away even if they don't have the money. Individuals are required to repay the amount they spend on a credit card, either in full or in installments, at the end of a specified period (Foscht et al., 2010).

2.1. Digital Payment Systems

Since the involvement of the Internet in banking transactions, digital payment systems have found a specialized application area, and the cost of performing this role is significantly lower than the cost of using centralized and reliable financial services (Mullan, 2014). While e-commerce websites once only utilized digital payment systems, they are now widely used by physical businesses experiencing a digital transformation. Online and offline companies seek ways to digitize within the limits of technology's capabilities to improve their competitiveness (Sun, Yang, Shen, & Wang, 2020). The adoption of digital payment systems is increasing due to this situation. The use of electronic systems to effectuate money exchange is what digital payment systems, often known as electronic or cashless payments, are all about (Staykova & Damsgaard, 2015). These systems encompass all online and mobile payment methods and online borrowing and credit cards.

In comparison to cash payment, digital payment has various advantages in terms of speed, compliance, and tracking economic transactions, such as being a verified digital means (Verkijika, 2020). Three main aspects play a role in achieving this superiority in a standard digital payment system: payer, payee, and interface/channel elements (Setor et al., 2021). The payer is the individual who starts the payment process digitally by making a purchasing choice. This person uses the interface/channel component to deliver his money to the recipient (e.g., virtual pos).

The tools used by digital payment systems vary in the context of financial purposes. Mobile devices that allow contactless payment among the tools used (Huang & Boucouvalas, 2006); mobile wallets (Madan & Yadav, 2016); POS and m-POS devices (Galande & Borkar, 2021); credit and debit account cards (Ghosh et al., 2016); prepaid e-shopping cards (Juang, 2010); smart speaker and voice payment tools (Ling, Chen, Ho, & Hsiao, 2021); international digital transfer protocols (Alkhowaiter, 2020); ID cards with payment capability (Chen, Mayes, Lien, & Chiu, 2011), and digital check (Sumathy & Vipin, 2017).

Furthermore, cryptocurrencies, which became popular in 2010, have been employed as digital payment systems (Hu et al., 2019).

2.2. Mobile Payment Systems

With the increasing importance of smartphones in people's lives, digital payment systems have evolved into mobile payment systems. With the rise of mobile communication options, it was recognized that digital payment procedures should be made mobile, and mobile versions of practically all-digital payment instruments were created in response. However, until certified and customizable applications were developed, mobile payments were made over web infrastructures and browsers. Mobile payments have a lot of potentials to lower transaction costs, increase payment security, and improve user experience (Eriksson, Gökhan, & Stenius, 2021).

The growth of smartphones and the recognition of the financial ecosystem as a normal, credible tool in today's development have provided firms undergoing digital transformation a substantial competitive advantage (Iman, 2018). Companies that seek to gain an advantage have begun to quickly implement mobile payment systems. However, various payment mechanisms dedicated to smartphones have fueled the growth of mobile payment systems. NFC (Tan, Ooi, Chong, & Hew, 2014) and QR (Yan, Tan, Loh, Hew, & Ooi, 2021) based payment systems have been developed throughout time, allowing cellphones to connect with retail payment systems. On the other hand, consumers resist using mobile payment methods due to frequent technological advancements and their unwillingness to shoulder the cost of keeping up with technology (Eriksson et al., 2021).

Mobile payment systems are mostly based on the smartphone's banking application or a GSM-based payment infrastructure unique to the phone's sim card (Bojjagani, Sastry, Chen, Kumari, & Khan, 2021). Mobile payments can be categorized as an internet payment method, a mobile point of sale payment method, mobile application payments, or person-to-person mobile payments, depending on their purpose (Valcourt, Robert, & Beaulieu, 2005).

SMS-based mobile payment is a type of mobile payment that involves transferring a person's bank account information. USSD (Unstructured Supplementary Service Data) is a GSM-specific technology that allows information to be published via GSM networks. SMS is a store-forward-oriented payment system, whereas USSD is a session-transaction-oriented payment method (Singh & Jasmine, 2012). As a result, payment refunds via USSD are faster.

WAP (Wireless Application Protocol) provides mobile services such as MMS (Multimedia Message Service) and internet access; GPRS (General Packet Radio Services) is another mobile data service for GSM customers. Apps for smartphones are another utility. Several new types of electronics and mobile enterprises have emerged due to mobile payment methods and a mobile market. In these businesses, mobile application markets are the most popular. Mobile app markets are online marketplaces where users can buy and sell apps for their cellphones (Eriksson et al., 2021). Hundreds of apps on these platforms cater to various needs that a smartphone user may have.

Another payment option is SIM-based applications, which use the chip on the SIM card to make mobile payments (Singh & Jasmine, 2012). On the other hand, NFC is a non-contact mobile payment technique that utilizes chip-like structures. NFC technology is based on the fact that a mobile phone is used to read the code in the terminal, with the phone acting as an RFID chip or chip reader mechanism (Liébana-Cabanillas, Molinillo, & Ruiz-Montaez, 2019).

Dual chip is a mobile payment technique that works with mobile handsets with two distinct SIM cards. One SIM card is used for phone calls on these devices, and another is utilized for mobile payments. This strategy is used by companies that conduct corporate financial transactions via mobile and emphasize payment security. It offers the entire control over a SIM card independent of search activities (Gómez, Arévalo, Paredes, & Nin, 2018). Finally, the mobile wallet (m-wallet) has evolved due to quickly changing mobile technology and varied consumer demands. M-wallet is a

secure and dependable mobile payment mechanism that allows users to save credit or debit card information and use it to make payments or money transfers to the m-wallets of individuals they know when it's needed (Lew, Tan, Loh, Hew, & Ooi, 2020). An m-wallet, like a real wallet, contains electronic currency, owner ID, access information, and credit card number.

2.3. Bibliometric Research On Digital Payment Systems

Digital payment systems are a common topic in the literature studied in parts or their entirety. There is also no direct bibliometric research on digital payment systems in the literature. There are, however, bibliometric analysis-themed studies on digital payment system subheadings in the literature. This research in the literature can be limited to a single journal or a specific topic within a database. Just as studies in the literature can sometimes address digital payment systems holistically within the financial ecosystem (Jain, Dash, & Thakur, 2021), occasionally cyber behavior (Serafin, Garcia-Vargas, Pilar Garcia-Chitiva, Caicedo, & Correa, 2019), cryptocurrencies (Nasir et al., 2020), electronic commerce (Mou, Cui, & Kurcz, 2019), mobile commerce (Hew, 2017), supply chain (Xu et al., 2018), blockchain (Guo et al., 2021) or Internet of things (Kamran, Khan, Nisar, Farooq, & Rehman, 2020). One of the studies (Sugu & Hussain, 2021) that focuses directly on the sub-dimensions of digital payment systems in the literature applied bibliometric analysis to a total of 127 articles written on e-wallets and indexed in the Scopus database. Another study using the same database (Abdullah & Khan, 2021) applied bibliometric analysis to 56 studies to determine mobile payment adoption levels.

3. Methodology

Literature evaluations aim to map the current literature to identify research gaps of future interest and highlight the current situation's limits (Tranfield, Denyer, & Smart, 2003). Manually creating a general map is a difficult and time-consuming undertaking. As a result, the bibliometric analysis approach was used to count the many characteristics of written communication, establish the direction of the literature, and conduct a general quantitative analysis of the literature research (Pritchard, 1969; Tranfield et al., 2003). "Info-metrics" (Wolfram, 2003) and "scientometrics" (Bar-Ilan, 2008) are closely related to bibliometric analysis.

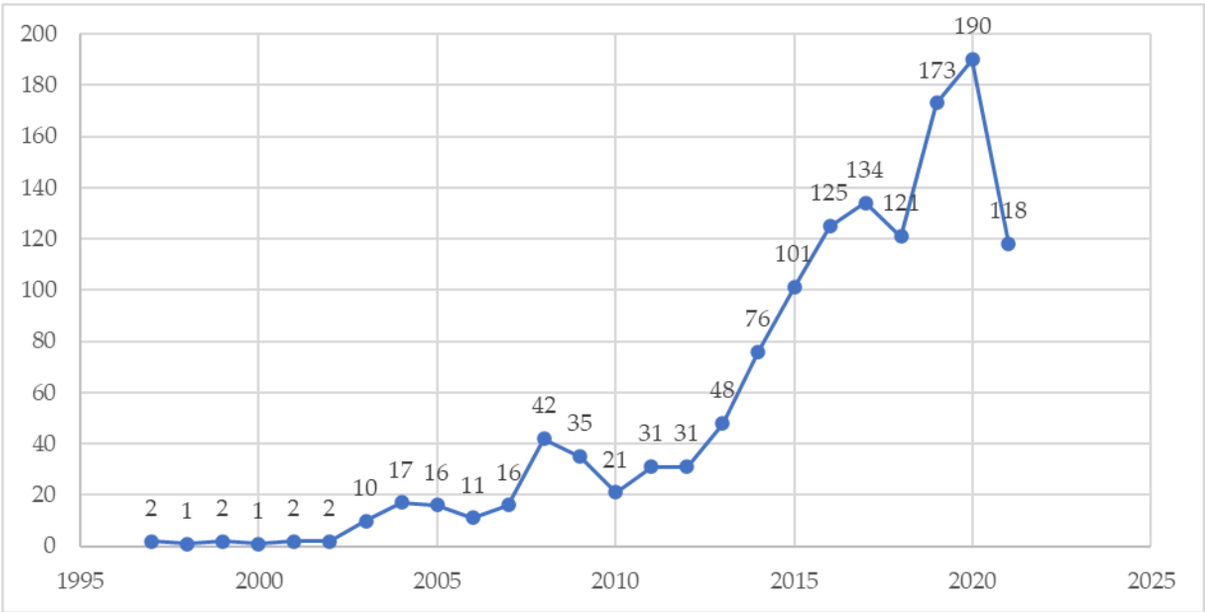
To determine the status of the digital payment systems issue in the literature, research was conducted using the Web of Science Social Science Citation Index database. Since 1997, when the first article about digital payment systems was published, the keywords "mobile wallet, mobile payment, digital payment, digital wallet" have been used when determining the studies of publications of about 25 years.

The "topic" search was used in the Web of Science Social Science Citation Index database. A total of 1326 articles were reached by examining "article" articles (proceedings paper, book, book chapter, etc. excluded) for predetermined search terms. Search results are stored to include all basic article information such as title, abstract, author(s), keywords, references.

4. Findings

Based on data from the WoS database, 1326 digital payment systems articles were obtained between 1997 and 2021, and the distribution of the studies over the years is shown in Chart 1.

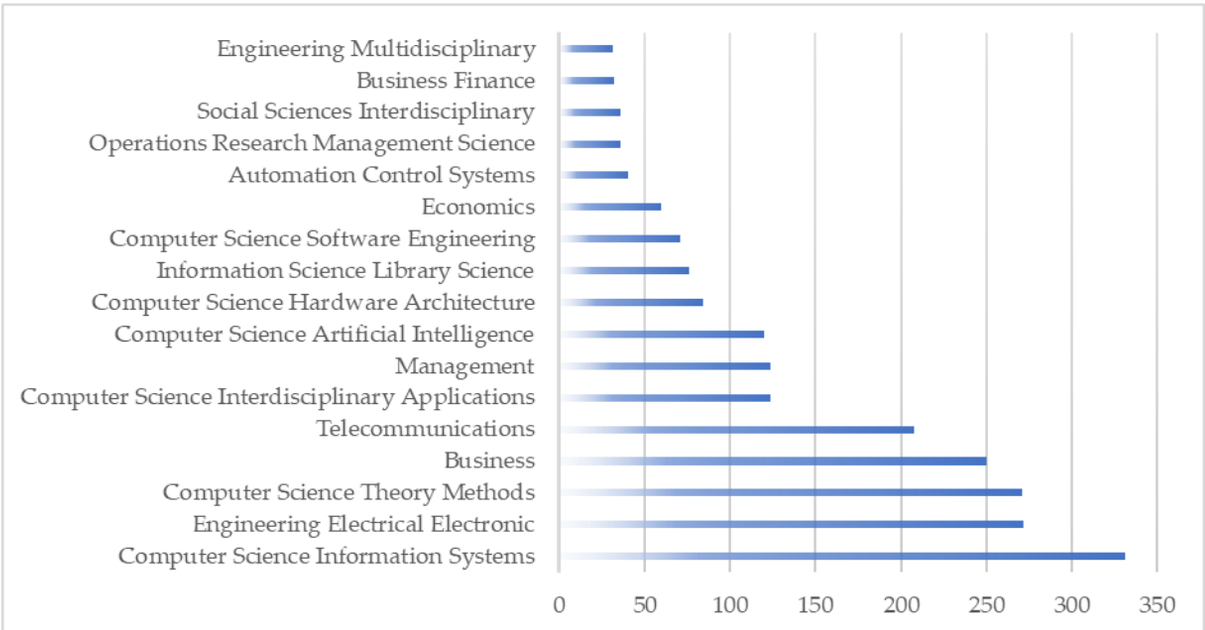
Chart-1. Number of studies conducted between 1997 and 2021



As seen in Chart 1, the first digital payment systems study was carried out in 1997. According to WoS data, studies on digital payment systems have increased since 2010. The most publications by year were made in 2020, with 182 studies, and 118 studies have been published so far in the first half of 2021.

The studies in the WoS database were prepared in 35 different categories, and the categories with more than 50 studies are shown in Chart 2.

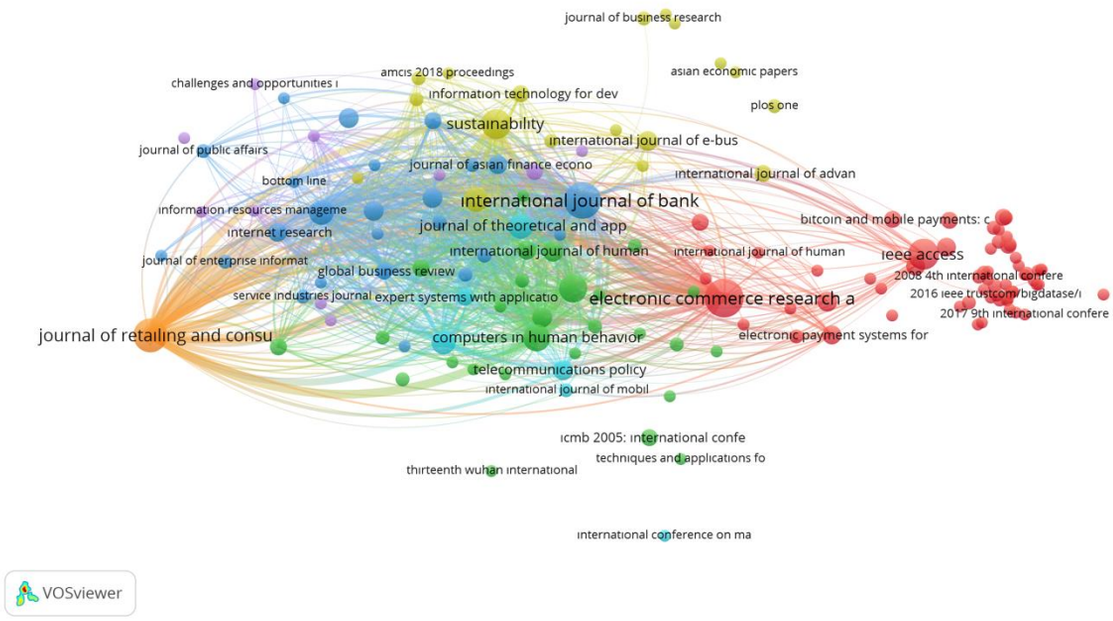
Chart-2. Number of publications by category



According to Chart 2, the first three categories in which the most studies on digital payment systems were made are "computer science information systems," "engineering electrical, electronic," and "computer science theory methods." About 46% of the studies on digital payment systems have been published in computer science journals, while about 25% have been published in journals related to economics, business, and management.

With the VOSviewer software, the studies on digital payment systems between 1997-2021 were examined in which journals were published, and the results of the analysis are shown in Figure 1.

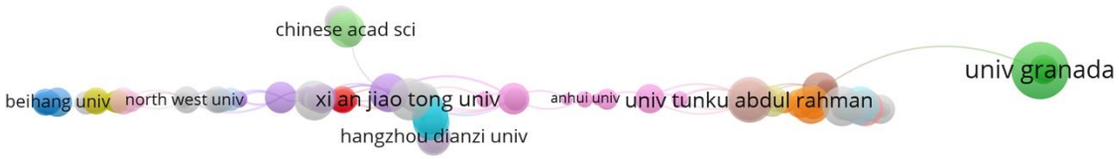
Figure-1. The journals in which digital payment systems studies were published between 1997-2021



According to Figure 1, when we look at the journals in which digital payment systems are published, "Lecture Notes in Computer Science" takes first place with 39 studies. While "Electronic Commerce Research and Applications" is second with 21 studies, "International Journal of Bank Marketing" is third with 19 studies. "Journal Of Retailing and Consumer Services" (16), "Sustainability" (15), "IEEE Advancing Technology for Humanity" (14), and "Procedia Computer Science" (14) are other essential journals in which studies on digital payment systems were carried out. When the studies conducted by years are examined, it is seen that the studies in 2020 are primarily in the "Journal of retailing and consumer services" and "Sustainability" magazines. It is concluded that the studies in the journals "Lecture notes in computer science" and "Electronic commerce research and applications," in which the most significant number of studies were conducted, are mostly between 2016-2018.

The results of the analysis showing in which universities the studies were carried out are shown in Figure 2.

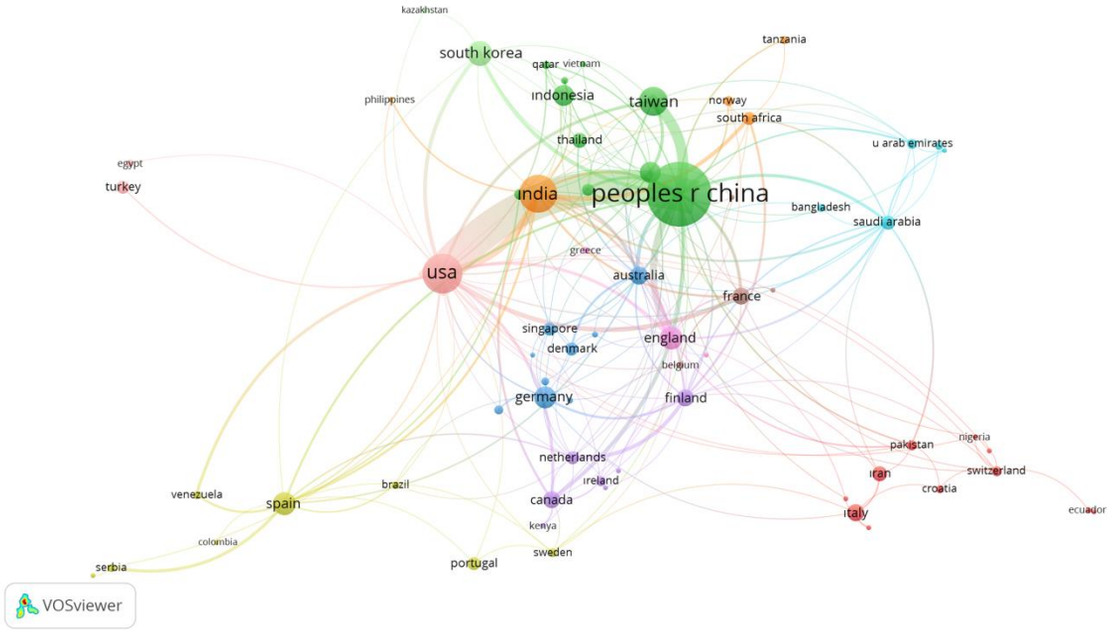
Figure-2. Distribution of digital payment systems studies published between 1997-2021 by universities



"Universiti Tunku Abdul Rahman" takes first place in the university ranking in terms of total publications. There are a total of 32 publications belonging to this university. "Xi'an Jiaotong University" (30), "The City University of Hong Kong" (27), "UCSI University" (25), "Universidad de Granada" (24), and "Soochow University" (24) are other essential universities where studies on digital payment systems are carried out. Helsinki Graduate School of Economics (620) ranks first in total citations. While "Universiti Tunku Abdul Rahman" is in second place with 567 citations, "Universidad de Granada" has 545 citations. "Hangzhou Dianzi University" (495), "Stanford University" (419), and "University of Lausanne" (402) are other universities with the highest number of references to publications on digital payment systems.

The analysis results indicating the studies carried out by the countries are shown in Figure 3.

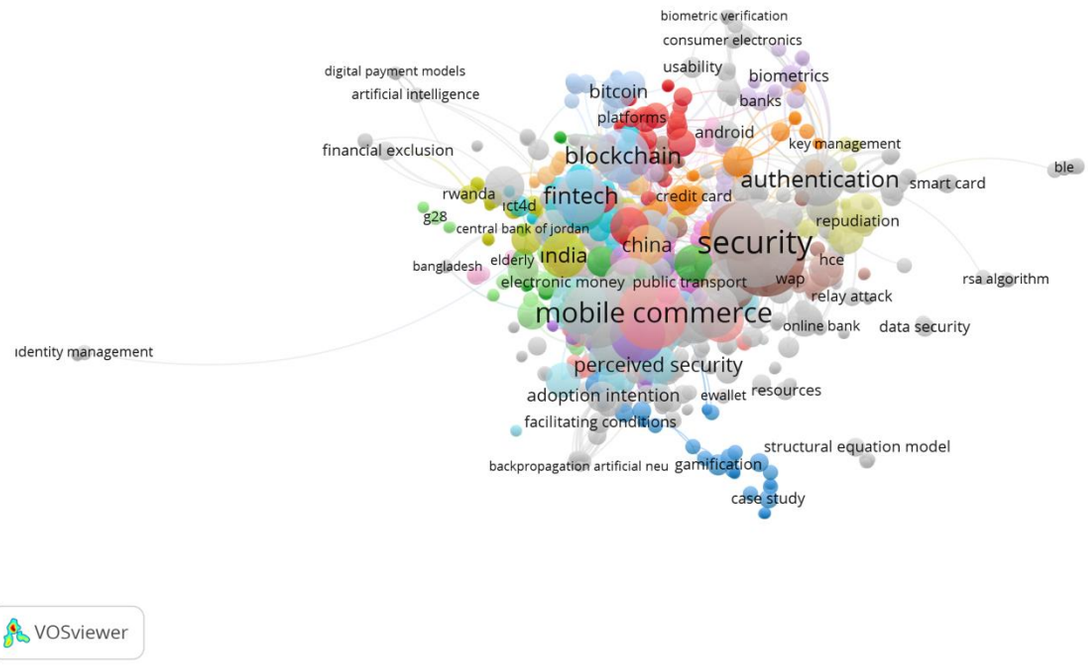
Figure-3. Distribution of digital payment systems studies published between 1997-2021 by countries



As seen in Figure 3, the country with the most studies are China (390), the USA (138), India (130), Taiwan (75 papers), South Korea (58 papers), and England (51 papers), respectively. According to Figure 3, it is seen that the studies in 2020 are in Germany, the Philippines, and Vietnam. It is concluded that the studies in China, where the most studies were conducted, are primarily between 2014 and 2016. It is noteworthy that studies on digital payment systems have been given importance in Turkey in recent years. China, the USA, and India are the top three countries in total citations. The citation rates of these countries are 2338, 2204, and 1410, respectively.

The analysis results of the keywords included in the studies on digital payment systems conducted between 1997-2021 are shown in Figure 4.

Figure-4. The keywords used in digital payment systems studies published between 1997-2021

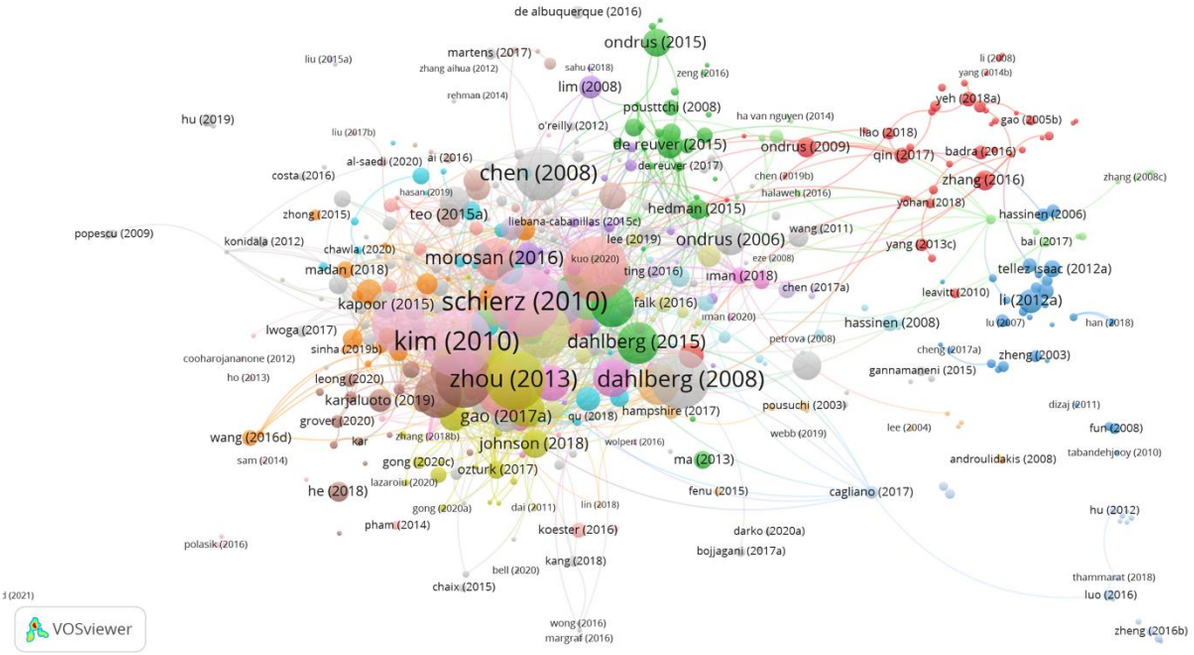


Among the keywords used in publications on digital payment systems, security is in the first place with 210 studies. NFC (near field communication) ranks second with 168 studies, followed by mobile commerce with 162 studies. Perceived risk (117 papers) and authentication (104 articles) are the most frequently studied topics.

According to Figure 5, it is seen that the studies in which the most used keywords security, near field communication – NFC, and mobile payments were between 2014 and 2016. In 2020, the words convenience, deep learning, trust, and Covid-19 related words with the effect pandemic being used more frequently were notable.

The final analysis of the studies on digital payment systems was made according to the number of citations. The analysis results of the citations to the studies published between 1997-2021 are shown in Figure 5.

Figure-5. The citations to digital payment systems studies published between 1997-2021



According to Figure 7, the top 5 most cited critical studies on digital payment systems are listed as Kim, Mirusmonov, and Lee (2010), Schierz, Schilke, and Wirtz (2010), Dahlberg et al. (2008), Mallat (2007) and Yang, Lu, Gupta, Cao, and Zhang (2012), respectively.

5. Conclusion

With the increasing number of publications, it is becoming increasingly difficult to convert the results of these studies into meaningful information. Bibliometric analyses, which allow many studies on the subjects examined to offer a bird's-eye view, provide convenience to researchers as an essential tool in overcoming these challenges. Through bibExcel, Pajek, VOSviewer, Bibliometricx, SciMAT, etc., researchers can create a visual map of the data related to the subjects they study to obtain healthier information and visual materials.

2989 authors have carried out 1326 studies on digital payment systems in 57 countries and 1326 different institutions in 25 years. These studies have been examined by years, subjects, published journals, universities, and country. Visualization of scientific maps was carried out thanks to the VOSviewer program for visualizing the analysis results.

Studies on digital payment systems have started to appear in the literature since 1997. From 1997 to 2010, digital payment systems, which received average attention, have been rising in 2011. Apart from 2021, most publications were made in 2020 with 190 studies. The small number of publications between 1997 and 2010 can be traced back to the limited internet use and electronic commerce globally. The increasing number of publications in 2013 and beyond is a result of the adoption of the Internet by almost all individuals, and researchers can examine the spread of internet shopping globally and different marketing options. Pandemic measures taken between 2019 and June 2021 due to Covid19 have made online shopping and digital payment alternatives necessary. This has increased electronic commerce worldwide. Even the "laggards and late majority" group classified in the Diffusion of Innovation (Rogers, 1983) theory have had to be part of digital payment systems.

According to the results of bibliometric analysis of the journals in which the studies of digital payment systems are published, it is concluded that journals in the field of banking and journals in the field of electronic commerce are predominantly based; it is possible to evaluate computer-based studies, management and economy-based studies and finally engineering-based studies in three main categories. The intensive use of security, mobile commerce, and authentication keywords in studies is noted as expressions of these three main categories.

Another conclusion obtained by this study is that the publications made are more predominant in China, the USA, and India. This can be interpreted together with the working categories. China's density of electronic commerce, the U.S. economy and private sector weight, and India's leadership in software make sense of this outcome. Another conclusion is that universities that studied digital payment systems are predominantly universities located in Asia (especially China). Aliexpress has had a major impact on the shift of physical commerce globally to the electronic platform, creating tremendous opportunities for the spread of internet technologies and trade security. The production of goods, which has shifted to Asia due to its production capacity and cheap labor market, has naturally attracted researchers working in this region. It is understood that academicians in developed countries in production, financial capacity, and supply work more on this subject than other countries. Especially manufacturing-oriented China, India with its cheap labor and information technology skills, and Taiwanese researchers, who produced the most intensive chips globally, contributed more to the literature of digital payment systems.

From another point of view, the economic elements (central banks, firms, and customers) that have to keep up with the speed of payment suffer from the slowness of physical money transmission. At the same time, blockchain technology has breathed new life into digital payment systems for companies that want to "leave" central banks. From this point of view, it is a natural result for researchers to use the words online bank, biometric verification, bitcoin, blockchain, etc., in the keywords of their work.

Digital payment systems have demonstrated this concept's global interest and value, which has just been introduced to the literature with its bibliometric study.

In this study, publications of digital payment systems were scanned only in the Web of Science Core Collection database. In future studies, it is recommended to conduct a more extensive study using databases such as Scopus, JStor, Google Scholar, Science Direct, etc. During the study process, publications of digital payment systems were limited using the terms mobile wallet, mobile payment, digital payment, digital wallet. Apart from these terms, expanding the research by including blockchain and cryptocurrency keywords or carrying out studies on these keywords will help examine the reflections in digital payment systems in detail. Considering the issues mentioned, more intensive studies on countries and products focused on digital payment systems will contribute to the literature. Similarly, blockchain research will be an essential research topic in examining the change in customer perception of decentralized virtual currencies.

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