



Research/Review

Digital Payment Trends in E-Commerce: Analysis and Implications for Business

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Abstract Digital payment, also referred to as digital payment, is a type of payment that uses electronic media such as SMS banking, internet banking, mobile banking, and electronic wallets. According to McLeod, electronic commerce, also called e-commerce, is the use of communication networks and computers to carry out business processes. This study aims to analyze the latest trends in digital payments in e-commerce, factors that influence digital payments, the impact of using digital payments, and analysis related to the advantages and challenges faced by businesspeople in implementing digital payment systems. The study was conducted through a descriptive qualitative approach with a literature study design. Businesses gain many benefits from digital payments, such as efficiency and better customer experience. To improve customer experience and drive sustainable growth, businesses can implement strategies such as education and training, development of technology infrastructure, diversification of payment methods, increased security, loyalty and incentive programs, data analysis, and collaboration with payment service providers.

Keywords: Digital Payment, E-Commerce, Business

1. Introduction

E-commerce, or electronic commerce, refers to the activity of buying and selling goods and services carried out online through digital platforms such as marketplaces, online store websites, and mobile applications (Ausat & Suherlan, 2021). This business model allows transactions without geographical boundaries, connecting sellers and buyers from various regions with greater efficiency than physical stores. E-commerce is growing rapidly thanks to advances in digital payment technology, logistics, and data-based marketing strategies that make it easier to personalize the shopping experience. In Indonesia, platforms such as Tokopedia, Shopee, and Bukalapak are prime examples of e-commerce that support the growth of the digital economy by providing opportunities for MSMEs to reach a wider market. However, challenges such as price competition, consumer trust in online transactions, and protection of personal data are still major issues in the e-commerce ecosystem (Amory et al., 2025).

Digital payment, also referred to as digital payment, is a type of payment that uses electronic media such as SMS banking, internet banking, mobile banking, and electronic wallets. All of these activities can be done using only electronic devices, namely smartphones. Digital payment is an innovation from the development of payment transactions from time to time. Starting in 1887, namely an idea of a transaction using a credit card described in the novel Looking Backward in 1887. The digital era emerged with the presence of the internet in 1969, which was created by Tim Berners-Lee, which we now know as internet pages and sites that make it easier to find and provide information. Then the internet developed into a trading medium (e-commerce) in the mid-1990s. Transactions continued to develop in 1983, namely the idea of electronic money, which was put forward by David Lee Chaum, who put forward the idea of digital cash in his research paper. Furthermore, in 1994 Stanford Federal

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Credit Union became the first institution to offer online banking services. At that time most online financial services used a micro payment system. In 1998 a mobile payment system appeared with wireless transactions, namely PayPal. After that, other mobile payment industries emerged, such as Apple Pay and Alipay. Now the idea of electronic money and digital transactions has become a reality and has begun to dominate the transaction system in various countries, one of which is Indonesia. The digital payment transactions in Indonesia are GO-PAY, OVO, T-Cash, Mandiri E-Cash, DANA, I-Saku, Sakuku, Doku, and others. In making payment transactions using digital payments, there are several advantages obtained as follows: Easier and more practical transactions, safer transactions, convenience in transactions, transaction speed, and can be used for various services (Handayani et al., 2022).

This study aims to analyze the latest trends in digital payments in e-commerce, factors that influence digital payments, the impact of using digital payments, and an analysis of the advantages and challenges faced by businesspeople in implementing digital payment systems. With limited samples and populations, this study only discusses e-commerce in Indonesia and does not discuss implementation in other countries. In addition, because the study was conducted over a certain period of time, the data obtained may not reflect changes that occurred during that period.

2. Literature Review

Definition of e-commerce and digital payments.

According to McLeod, electronic commerce, also called e-commerce, is the use of communication networks and computers to carry out business processes. The definition of e-commerce is using the internet and computers with web browsers to introduce, offer, buy, and sell products. The benefits of implementing e-commerce are that a company can have an international market. Business can be run without having to be constrained by national borders with digital technology. Operational costs can be reduced as much as possible. Speed up processing time and reduce the risk of human error. Reduce paper usage in various work activities ranging from designing, producing, shipping, and distribution to marketing (Farhan, 2025).

In the payment system there are cash and non-cash payment instruments. In the cash payment system, there are types of fiat money in the form of banknotes and coins that have value and are legal tender in a country. While non-cash payment instruments are credit and debit cards issued by banks and electronic money (Bank Indonesia, 2019),

Types of digital payment methods

Here is a summary of some of the most common types of digital payments in Indonesia (Aditya, 2024):

- Mobile Banking: This application is available on the App Store or Play Store and allows customers to download and make digital payments through their smartphones.
- SMS Banking is a financial transaction service where customers can register and make transactions via SMS using the USSD Menu Browser (UMB) feature.
- Internet Banking: Customers have to visit the bank to activate this service. After verification, they can make financial transactions securely using the token.
- e-Money: Electronic money services that allow fast and secure transactions over the internet have become a popular choice for people looking to complete financial transactions.
- e-Wallet: A digital wallet that allows users to invest, make online purchases, and pay bills through their mobile devices.
- Bank Card: Debit and credit cards are convenient and safe for paying without cash. This method has been used since the 1980s.

- QRIS: Indonesia's standard quick response code that allows customers to make transactions using QR codes from various payment system providers, making transactions easier.
- Micro ATM: A device that provides convenience and security in transactions through fingerprint authentication, allowing customers to access banking services.
- PoS Terminal: A secure and fast payment method in stores that allows customers to use debit or credit cards.
- PayLater: A payment method that allows customers to buy now and pay later with an installment plan similar to a credit card. It is available at online and retail stores.

3. Research Methodology

The study was conducted through a descriptive qualitative approach with a literature study design. The purpose of this approach is to provide an in-depth overview of the efficiency of digital payments, including the advantages, disadvantages, and solutions to using them. This study uses secondary data obtained from the results of studies, previous research, scientific articles, books, and documents related to the research. The data collection methods applied in this study are observation, interviews, and documentation. In this study, qualitative data analysis techniques are used to obtain data and draw conclusions from what is obtained during the research.

4. Discussion

The e-commerce industry in Indonesia is experiencing rapid growth due to increasing internet penetration and changes in consumer behavior, driven by the use of smartphones and social media. Platforms such as Shopee, Tokopedia, and Bukalapak, and social media such as Facebook and Instagram, are popular among people of all ages. AI technologies, including machine learning and predictive analytics, have transformed the way companies conduct digital marketing by increasing the personalization of user experiences and operational efficiency. While AI offers many benefits, challenges such as high costs, limited expertise, and ethical issues related to privacy also need to be addressed. E-commerce provides convenience for shopping but can also encourage impulsive consumer behavior. The definition of e-commerce varies and continues to evolve along with changes in the industry (Abdan et al., 2024).

Online shopping is increasingly popular, prompting many people to use the internet to meet their needs. E-wallets offer greater convenience and security with encrypted payment information and additional features such as two-factor authentication, so users only need to select an e-wallet as a payment method and authenticate to complete a transaction. During the Covid-19 pandemic, e-wallet usage has increased, and research on the Technology Acceptance Model (TAM) shows that new users are more interested in the pay later feature. According to research conducted by Zaid Kilani et al. (2023), performance expectations, effort expectations, habits, price value, and trust have a significant influence on the desire to use e-wallets. It is proven that trust has a major influence on continued usage intentions; performance expectations are the second most influential factor. Continuous usage behavior and habits are directly related to continued usage intentions. (Syafri, 2023)

Digital Payments

By using a software application or platform, a digital wallet or e-wallet allows users to store and manage payment information securely. 1. Bank Indonesia Regulation Number 11/12/PBI/2009 dated April 13, 2009, concerning Electronic Money and 2. Bank Indonesia Circular Letter Number 11/11/DASP dated April 13, 2009, concerning electronic money, regulates the management of electronic money in Indonesia (BI, 2020). Electronic money is considered a means of payment if it meets the following three requirements: it is issued on the basis of money that has been deposited in advance with the issuer; the money is stored electronically in media such as chips or servers; and the issuer does not manage the value of electronic money as savings according to banking law (BI, 2020).

Digital wallets, a revolutionary payment tool, are changing the way we make transactions. E-wallets are gaining popularity due to the rise of digital technology and mobile devices. E-wallets are the most widely used payment method in Indonesia in 2022, according to data from East Venture (Naurah, 2023). E-wallets are digital wallets that allow you to store and manage your payment information in a convenient place. E-wallets offer a variety of benefits, including faster and safer transactions, easier access, and more convenience. In general, the electronic transfer of money or funds between two entities, such as banks, companies, governments, and individuals who purchase goods or services, is called e-payment. Non-cash payments, such as those made with debit cards, credit cards, PayPal, or Apple Pay, all fall into the e-payment category. By using e-payments, customers can enjoy greater convenience, security, and speed. Digital payments offer a safe and convenient payment method for customers. Digital payments include non-cash payments such as debit, credit, or prepaid cards; account instructions; Electronic Fund Transfer (EFT) systems; e-money; virtual or digital money; and direct payments to digital accounts. (Wardhana et al., 2023). Ease of processing payments, speed of payment, and the ability to top up through various available facilities are some of the advantages of digital wallets (Latief & Dirwan, 2020). It can be concluded that one of the beliefs in decision-making is that if users find a technical system that is easy to use, they will use it, and vice versa.

Napitupulu & Supriyono (2022) found that the security aspect greatly influences customer trust in e-commerce in Indonesia, especially in terms of transactions and personal data protection. Online shopping safety is considered important by Indonesian customers. This study shows that implementing strong security systems, such as data encryption and two-factor verification, on Indonesian e-commerce platforms is very important. In addition, it was found that consumer trust is influenced by the reputation of vendors and the quality of service they provide. The researchers suggest that privacy and security policies be made clearer and consumers be educated on how to stay safe online.

According to InsightAsia's "Consistency That Leads: 2023 E-Wallet Industry Outlook" report, e-wallets have become a popular payment method in Indonesia, with 74% of people surveyed actively using them for various financial transactions. Compared to other methods, such as cash (49 percent), bank transfers (24 percent), QRIS (21 percent), Paylater (18 percent), debit cards (17 percent), and VA transfers (16 percent), e-wallets are superior. The study involved 1,300 people from 7 major cities in Indonesia (Jakarta, Bandung, Medan, Makassar, Semarang, Palembang, and Pekanbaru) from 19 to 30 September 2022. The results show that for the past 5 years, GoPay has become the most widely used e-wallet platform.

Factors driving the adoption of digital payments by consumers and businesses

There are several factors that encourage consumers to adopt digital payments as follows:

- Convenience, comfort, speed: Digital payments enable quick and easy transactions without the need to carry cash or physical cards. Faster payments reduce wait times at the checkout, leading to happier customers who spend more.
- Security: Encryption and two-factor authentication are security features frequently used in digital payments, which provide customers with a sense of security when making transactions.
- Accessibility: Consumers can now make transactions more easily thanks to increased internet penetration and smartphone usage.
- Technological Innovation: Improved user experience and personalization of services can be achieved through technological advances such as artificial intelligence and analytics.
- Support from E-commerce: Customers can shop online more easily thanks to the integration of digital payment methods in e-commerce platforms.
- Promotions and Incentives: Digital payment service providers often hold promotions and discounts to attract new customers.

- Changing Consumer Behavior: The COVID-19 pandemic has driven the use of digital payments, and more customers are turning to online shopping.
- Government Regulations and Policies: Government regulations support the use of electronic money.
- MSME Engagement: Micro, Small, and Medium Enterprises (MSMEs) are starting to use digital payments to increase the productivity of their operations.
- Lifestyle Changes: With modern life becoming more instant, customers are more likely to look for more efficient payment methods. Businesses can provide more personalized customer experiences, such as relevant product recommendations and special offers, by using data collected through digital payments.
- Access to Loyalty Programs: Many electronic payment systems and e-wallets have loyalty programs that allow customers to earn points or discounts to enhance their relationship with the brand.
- Reduced Operational Costs: Businesses can improve operational efficiency and reduce cash management costs by using digital payments.
- Better Data Analysis: With digital payments, companies can collect and analyze transaction data. This information can be used to determine better marketing strategies and understand customer behavior.

The impact of digital payments on customer experience Increased Convenience: Customers have a better experience because digital payments allow them to make transactions quickly and easily without having to carry cash or physical cards.

- Enhanced Marketing Strategies for Businesses: Businesses should use digital payment data to create more effective marketing strategies.
- Investing in Technology: Businesses must invest in digital payments and staff training to stay competitive.
- Focus on Security: To build customer trust, businesses must ensure their payment systems are secure.
- Adapting to Change: Businesses must be ready to keep up with evolving payment technologies and changing customer preferences. While there are many benefits, some customers may be uncomfortable or distrustful of new technologies, which can deter businesses from embracing digital payments.

Analysis of the advantages and challenges faced by businesses in implementing digital payment systems.

Implementing a digital payment system has many benefits for businesses, but it also has some problems. Here is a thorough analysis of both components. Benefits of Implementing a Digital Payment System

- Although digital payments, or e-payments, are increasingly popular in society, especially in the era of the industrial revolution 4.0, thanks to advances in information technology that allow for face-to-face banking transactions, many people in Indonesia still prefer cash payments due to a lack of understanding of the advantages of digital payments (Via, 2024). The advantages of a digital payment system include
- Convenience and Practicality: Transactions via mobile devices or computers can be done quickly without carrying cash. With digital payments, transactions can be done faster and waiting times are shorter, which can improve customer experience and encourage them to shop more. A study by Accenture found that 70% of customers prefer fast and easy payments.

- High Security: Security features such as encryption, PIN codes, and two-factor authentication protect user data and funds and are supervised by OJK and BI. Digital payment systems often have security features such as encryption and two-factor authentication, which reduce the risk of fraud. According to a report by Cybersecurity Ventures, companies that use digital payment systems experience a decrease in fraud incidents of up to 40%.
- Convenience: The easy-to-use interface and fast transaction process make it easy to use by a wide range of people.
- Real-Time Transaction Process: This is very useful for urgent transactions as they can be verified and completed instantly within seconds.
- Service Flexibility: This application can do many things, such as paying bills, buying credit, and transferring money.
- Supporting the Cashless Movement: Digital payments increase financial inclusion, reduce cash usage, and improve economic efficiency.
- Access to Wider Markets: Digital payments allow businesses to reach consumers worldwide with support for multiple currencies and payment methods. This has the potential to increase sales, especially in the global e-commerce market.
- Data Collection and Analysis: With a digital payment system, companies can collect real-time transaction data for customer behavior analysis and strategic decision-making. This data can help in designing more effective marketing campaigns.
- Digital payment systems have many advantages. In addition to being a safer and more practical solution, they also help transform the digital economy as a whole, increasing innovation, efficiency, and sustainable economic progress.

Some of the main problems among micro, small, and medium enterprises (MSMEs) that prevent digital payment systems from functioning properly and being used properly are (Putri & Radiman, 2022):

- Dependence on Internet Network: Limited and unstable internet access, especially in rural areas, hampers transactions and prevents users from switching to digital payments.
- Unequal Smartphone Ownership: Many people, especially the elderly or those less exposed to technology, do not have enough smartphones to make online transactions, so they continue to rely on cash.
- Technology Understanding: Many small and medium-sized businesses (SMEs) are not familiar with digital payment systems, making it difficult to implement them. Some customers may feel uncomfortable or distrustful of new technologies, which can hinder the adoption of digital payment systems. To overcome these barriers, it is important to educate customers and socialize with them.
- Merchant Discount Rate (MDR) Fee: MSMEs must bear a fee of 0.7%.
- Cybercrime Risk: The increasing potential for cybercrime poses a threat to the security of digital transactions. Although digital payment systems offer security, the risk of fraud and theft of personal data remains a problem. A PwC survey showed that forty percent of customers who use digital payment methods continue to have concerns about the security of their data.
- Fierce Competition: Many service providers make the digital payment market increasingly competitive. To stay relevant in the market, businesses must continue to innovate and add value.

- Regulation and Compliance: Businesses must comply with a variety of regulations regarding data and transaction security, which can be more difficult to enforce. Failure to comply with these regulations can result in fines and loss of reputation.

Strategies for businesses to optimize the use of digital payments.

Here are strategies for businesses to improve customer experience, optimize the use of digital payments, and drive sustainable growth:

- Education and Training

Training and Education Programs: Educate employees and customers on how to use digital payment systems. This can increase user knowledge and confidence in the technology.

Socialize Benefits: Educate customers on the benefits of digital payments, such as convenience, security, and speed of transactions.

- Technology Infrastructure

Technology Infrastructure Improvement Investment in Technology: Ensure that the technology infrastructure supporting digital payment systems is adequate, including compatible hardware and stable internet connections.

System Integration: To increase operational productivity, integrate digital payment systems with e-commerce platforms and business management systems.

- Diversification of Payment Methods

Multiple Payment Options: To cater to different customer preferences, offer a variety of digital payment methods such as e-wallets, credit cards, and bank transfers.

Ease of Access: Make sure the payment process is easy to use and simple so customers can complete transactions quickly.

- Security

Transaction Security: Protect customer data and funds by using advanced security features such as data encryption, two-factor authentication, and transaction monitoring.

Security Awareness Campaign: Educate customers about the importance of digital transaction security and how to protect their personal data.

- Loyalty and Incentives

Loyal Users: Offer loyalty programs or incentives, such as cashback or discounts, to attract customers to use digital payments.

Special Promotions: Offer special promotions for transactions using digital payments so that more customers can be attracted.

- Data analysis

Transaction Data Collection: Use transaction data to see customer behavior and find trends that can be used to improve marketing strategies.

Customer Feedback: Collect information about how customers use the digital payment system and use this information to help improve it.

- Collaborating with Payment Service Providers

Strategic Partnerships: Partner with digital payment service providers to gain technical support and access to the latest technology.

Joint Promotions: Conduct joint promotions with payment service providers to increase visibility and drive adoption of digital payment systems.

- Market Changes

Monitor Trends: To stay competitive, always stay abreast of the latest trends and developments in digital payment technology.

Flexible Strategy: Prepare a strategy that can change according to customer preferences and technological advancements.

Case Study

In the study Analysis Of The Impact Of Digital Payment Services On The Use Of Conventional Bank Services: Case Study Of The Use Of Dana, Ovo, Shopee Pay, And Gopay Among Students Of Stim Sukma (Annisa, Wardani, 2024), Medan discusses how digital payment services such as DANA, OVO, Shopee Pay, and GoPay impact the use of conventional banks by STIM Sukma Medan students. This study was conducted using a quantitative method, with 80 active students out of 535 students surveyed.

According to the research results, when they make daily transactions, most students prefer to use digital payment services rather than conventional banks. This choice is due to the ease and convenience offered by the financial technology (FinTech) system. However, due to higher interest rates and guarantees from the Deposit Insurance Corporation (LPS), students still want to save in conventional banks. According to the regression analysis, digital payment services have a significant impact on the use of conventional banking services. With a coefficient of determination (R^2) of 36.1%, this shows that conventional banks still play an important role as a safe and profitable place to store savings even though digital services are increasingly popular. Overall, this study shows that students have adapted to technological advances by using digital services for daily transactions and conventional savings services. This study shows how the younger generation in the computer and internet era is changing their financial behavior.

Dewi A. N. Pratama and A. R. (2022), in their research on the implementation of QRIS payment instruments (case study in MSMEs in Kutawargi Village), explain the shift from cash to more efficient digital payments thanks to technological advances. The purpose of this study is to increase the knowledge of MSME actors and residents about the use of QRIS. This study was conducted using a qualitative descriptive method, which includes observation, socialization, and training.

The results show that residents and MSMEs still use manual payment systems and do not understand digital payment tools. It is hoped that they can more easily make digital buying and selling transactions with assistance and training. This study emphasizes that mindsets must be changed to keep up with technological developments, get ongoing training, and continuously carry out community service programs to maintain continuity.

From the two case studies above, it can be concluded that digital payment services such as DANA, OVO, Shopee Pay, GoPay, and QRIS have changed people's financial behavior, especially among teenagers and small and medium enterprises. Although they still use conventional banks to save, STIM Sukma Medan students choose digital payments because of the convenience they offer. Research conducted in Kutawargi Village shows that residents and MSME owners must be trained to make better use of digital payments. Changing the way we think and adapt to technology is essential to increasing the efficiency of financial transactions. Conventional banks still play an important role as a safe place to store savings even though digital payments are increasingly popular, showing that the two systems can work together in a financial environment .

5. Conclusion

Businesses gain many benefits from digital payments, such as efficiency and better customer experience. Some factors that influence the use of digital payments are convenience, security, technological innovation, transaction speed, and reduced operational costs. However, there are several problems in the digital payment system, such as dependence on the internet, uneven smartphone ownership, low technological literacy, risk of cybercrime, intense competition, and regulatory limitations. To improve customer experience and drive sustainable growth, businesses can implement strategies such as education and training, development of technological infrastructure, diversification of payment methods, increased

security, loyalty and incentive programs, data analytics, and collaboration with payment service providers.

Suggestion

In future research on digital payment trends in e-commerce, it is hoped that researchers will focus more on international comparative analysis, conduct longitudinal studies, use quantitative approaches, and focus on security and privacy. By following these recommendations, future research can make a greater contribution to a deeper understanding of digital payment trends in e-commerce.

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