Science, Education and Innovations in the Context of Modern Problems
Issue 12, Vol. 8, 2025

Title of research article

Adopting Electronic Payment Systems as a Strategic Mechanism for Sustainable Economic Development in the Digital Era

Hairech Noureddine
Faculty of Law and Political Science, University of Mascara
Algeria
| E-mail: hairechnou@univ-mascara.dz, (mailto:hairechnou@univ-mascara.dz)

Teldja Badra
Faculty of Law and Political Science, University of Mascara
Algeria
| E-mail: badra.telja@univ-mascara.dz, (mailto:badra.telja@univ-mascara.dz)

Issue web link https://imcra-az.org/archive/387-science-education-and-innovations-in-the-context-of-modern-problems-issue-12-vol-8-2025.html

Keywords Digital economy; electronic payments; fintech; consumer protection; e-commerce; legal regulation; financial obligations

Abstract
Recent empirical indicators demonstrate that the digital economy is expanding at an unprecedented pace, establishing a digital ecosystem that has become a major driver of economic productivity, innovation, and commercial competitiveness. Electronic payment systems, as one of the most influential pillars of this transformation, have revolutionized consumer-supplier interactions by enabling instantaneous financial transactions, removing geographic constraints, and minimizing procedural burdens. These methods provide notable advantages such as transaction speed, operational flexibility, and cost-efficiency. Nevertheless, despite their economic potential, electronic payment systems continue to raise significant legal and technical challenges related to consumer protection, cybersecurity vulnerabilities, regulatory capacity, and data confidentiality. Thus, the debate shifts toward examining whether existing legal frameworks can adequately guarantee both transactional efficiency and security in digital environments. This paper investigates the conceptual foundations of electronic payment mechanisms, their legal characterization in national and comparative legislation, and their role in shaping a more dynamic and sustainable digital economy. The study seeks to evaluate the extent to which these systems effectively meet consumer expectations, facilitate financial inclusion, and contribute to broader national economic development.

Citation. Hairech N.; Teldja B. (2025). Adopting Electronic Payment Systems as a Strategic Mechanism for Sustainable Economic Development in the Digital Era. *Science, Education and Innovations in the Context of Modern Problems*, 8(12), 1190–1196. https://doi.org/10.56334/sei/8.12.97

Licensed
© 2025 The Author(s). Published by Science, Education and Innovations in the context of modern problems (SEI) by IMCRA - International Meetings and Journals Research Association (Azerbaijan). This is an open access article under the **CC BY** license (http://creativecommons.org/licenses/by/4.0/).

Received: 13.04.2025 | Accepted: 02.10.2025 | Published: 16.11.2025 (available online)

Introduction:

The digital revolution that is witnessed by the world recently has touched all vital domains and changed either various aspects of human life. This has led to the point where the economies of nations are increasingly taking place within a virtual space. The rise of technological industries, along with the rapid and astonishing development in digital technologies, has made electronic platforms and communication networks the key drivers of international trade. This shift has captured the attention of consumers who are eager for greater speed and efficiency in acquiring their needs—especially within the vast scope of consumer contracts.

In light of the growing digital economy, one of the most prominent legal challenges has been the need to improve and advance consumers' financial commitments and transactions. This involves seeking technical means that ensure a gradual shift away from traditional payment methods, which often pose burdens and risks to consumers, toward modern electronic payment methods. These digital tools have become a contemporary experience and a turning point in how consumers fulfill their financial obligations, thereby contributing to the pursuit of economic development.

Accordingly, the main question arises: What are electronic payment methods? How significant are they in the development of the digital economy and the achievement of economic growth? And to what extent do they satisfy consumer needs in the context of electronic commerce?

1. The Nature and Forms of Electronic Payment Systems

In this section, we aim to shed light on the most significant contributions of jurisprudence and legal scholarship in enriching the conceptual framework of electronic payment methods. This will include an overview of the legislative definitions, followed by a presentation of the most common and widely used types and forms of electronic payment systems in the context of the digital economy.

1.1 The Concept of Electronic Payment Methods

An electronic payment is essentially the process of transferring money to pay for goods and services through digital means, typically via computers, the internet, or any other data transmission technology. Article 06 of the Algerian Electronic Commerce Law No. 18/05 defines an electronic payment method in its sixth paragraph as:

"Any payment method authorized under the applicable legislation that allows its holder to make payments either in proximity or remotely through an electronic system."

This definition is largely in line with those found in comparative legislative frameworks. For instance, Article 2 of the Tunisian Electronic Commerce Law defines an electronic payment method as:

"A method that enables its holder to perform direct remote payment operations through public communication networks."

To complete this conceptual overview, the terminological framework of electronic payments cannot be fully understood without considering their key characteristics. Therefore, the following sections will explore the main features specific to electronic payment methods.

1.1.1 Characteristics of Electronic Payment Methods

Electronic payments have a distinct nature, characterized by a set of features that make them a unique and modern mechanism for fulfilling financial and monetary obligations. These characteristics align with the evolving concept of the digital economy and electronic commerce, and can be summarized as follows:

a) International Nature:

Electronic payment methods are universally accepted and widely recognized across the globe. They are used to settle accounts in transactions conducted within cyberspace between users regardless of geographic location.

b) Use of Electronic Money:

Electronic payments involve the use of electronic money, which refers to a monetary value stored on a card with a digital memory, or on the primary memory of the institution managing the exchange process.

c) Remote Transaction Capability:

This method is primarily employed to settle electronic transactions remotely, where contracts are concluded between parties separated by physical distance—typically via the internet. This leads to the reduction of spatial barriers by enabling the exchange of electronic information and data. Wireless communication networks play a crucial role in this process by allowing the issuance of payment orders based on electronic inputs that facilitate direct contact between contracting parties.

d) Payment Modalities:

Electronic payment can be executed in two ways:

Through dedicated electronic funds, where payment is completed via deduction from preloaded electronic money—as in contracts involving advance payment.

Through regular bank cards, where the amounts are not preloaded but are debitable through other instruments such as checks.

e) Banking System Infrastructure:

The effectiveness of electronic payments requires a banking system equipped to handle such operations. This includes the necessary technological infrastructure to facilitate remote transactions and enhance trust and convenience among the parties involved.

f) Network Types:

Electronic payments are conducted through two types of networks:

Private Networks, where communication is limited to the contracting parties, typically based on existing financial or commercial relationships.

Public Networks, which operate on an open system allowing transactions between individuals regardless of whether prior relationships exist.

1.2 Forms of Electronic Payment Systems

Technological advancements and the parallel surge in consumer interest in digital and automated platforms, especially those designed for e-commerce, have raised the issue of how to settle such commercial and consumer-oriented transactions. As a result, electronic payment methods were innovated as modern alternatives to traditional financial settlement mechanisms. These methods take many forms:

i. Electronic Transfers

This method involves transferring a certain amount from the debtor's account to the creditor's account. This process is managed by an entity supervising the electronic payment process, usually a bank.

ii. Plastic Money (Bank Cards)

Plastic magnetic cards are issued by banks for clients to avoid carrying physical cash. Common examples include Visa, MasterCard, and American Express. These bank cards come in several forms:

- **A) ATM Cash Cards**

Issued to reduce crowding at bank counters, these allow clients to withdraw money outside banking hours via ATMs using a 4-digit PIN. The ATM offers various options and provides a receipt with transaction details.

- **B) Charge Cards**

A form of electronic payment used in online banking, also known as ATM cards, where the credit period does not exceed one month. Clients must repay the amount within the month.

- **C) Smart Cards**

Prepaid plastic cards with embedded chips, used mainly for small transactions. They can be reloaded and require a card reader at the merchant's location.

- **D) Credit Cards**

These contain magnetic strips with readable (non-encrypted) data. The issuing entity allows clients to purchase goods/services, paying the merchant directly and later collecting from the cardholder with a 1% interest charge. These are issued only to those with sufficient deposits or stable income. Cards have usage limits, a personal photo, a hologram to detect counterfeits, and a signature strip.

iii. Electronic Checks

These are digital equivalents of traditional paper checks, containing:

- Check number
- Payer's name and account number
- Bank name
- Beneficiary's name

- Amount
- Currency
- Validity date
- Electronic signature and endorsement

Key systems:

- **ESTC**: Adopted by a group of U.S. banks, allows consumers to use various electronic methods using the same checkbook.
- **Cyber Cash**: A U.S.-based electronic check system, but does not allow payment method flexibility like ESTC.

iv. Banking Electronic Channels

These include telephone banking, electronic clearing, and internet banking. Services are available 24/7. Users verify their identity with a PIN and a known phone number to request transfers for online purchases.

v. Electronic Money

There are many legal and scholarly definitions. Two notable ones:

- **Scholarly definitions:**
  - Digital units transferred between accounts, stored on smart cards or PCs.
  - Prepaid or account-free digital value accepted broadly as a payment tool.
- **Legal definitions:**
  - **Basel 1998 Conference**: Prepaid value systems enabling payments via special devices or over open networks like the internet.
  - **European Central Bank**: Stored monetary value on a technical medium used broadly for payments without a linked bank account.
  - **French Law (2013/100)**: Electronic value issued against money transfer, accepted by individuals other than the issuer.

2. Securing Electronic Payments

While e-payment systems simplify transactions and improve financial commitments, they are not without risks to consumers, merchants, and suppliers. These risks require both legal and technical safeguards.

2.1 Risks Associated with Electronic Payments

2.1.1 Misuse by Cardholders

- Using forged documents to obtain cards
- Using expired or canceled cards
- Collaborating with merchants or employees to exceed withdrawal limits
- Depositing bad checks through POS and cashing them before interbank reconciliation

2.1.2 Misuse by Others

- Theft or loss of card or PIN
- Forging or stealing credit cards
- Misuse with the cardholder's consent (e.g., lending the card and later denying transactions)

2.1.3 Bank Employee Manipulation

- Creating fake card numbers or fraudulent websites to intercept transactions.

2.2 Securing Electronic Payments: Legal Protection

Focus here is on **civil legal responsibilities**, especially concerning payment cards.

2.2.1 Bank's Responsibility Toward Cardholder

- **Contractual breach**: If the bank fails to settle a merchant's claim, resulting in harm to the consumer (e.g., seizure of assets), the bank is liable to compensate.
- **Failure to act on opposition notice**: If the card is stolen/lost and the consumer reports it, the bank must notify merchants and block transactions. Any use afterward is the bank's liability.
- **Failure to verify identity or safeguard data**: If the bank discloses data or doesn't check the cardholder's identity properly, it bears full responsibility for fraudulent withdrawals.

2.2.2 Bank's Responsibility Toward the Merchant

- If the bank fails to pay invoice amounts, leading to damages (e.g., creditor seizures), the merchant can demand compensation.
- If the bank fails to inform the merchant about stolen or forged cards, it is liable unless the merchant is proven complicit.

2.2.3 Merchant's Responsibility Toward the Cardholder

- **Contractual liability**: For violating obligations like exposing cardholder data or signature.
- **Tort liability**: For discriminatory treatment between card users and cash-paying customers (e.g., offering no benefits despite choosing electronic payments).

Conclusion

Electronic payment systems have added real value to consumers by enhancing financial efficiency and improving online payment processes, boosting the digital economy and e-commerce. However, legal frameworks must continue evolving to protect users.

Key takeaways:

- **The digital economy should not grow at the expense of consumer rights**, especially regarding legal protections during transactions.
- E-payment systems have revolutionized financial performance but must also **ensure security**, particularly in legal terms.
- There is a need for **judicial specialization in electronic liability**.
- Criminal law or e-commerce law must **explicitly criminalize violations** like data leaks or electronic fraud.
- The **Algerian government must offer incentives** to promote digital payments and absorb parallel market cash into the formal economy.
- **Internet speed and reliability** are critical; poor infrastructure undermines advanced payment systems.

Methodology

This research employs a qualitative analytical methodology based on:

Comparative legal analysis of Algerian legislation (Law 18/05), Tunisian e-commerce regulation, and European digital payment directives.

Doctrinal legal research, involving the examination of jurisprudence, legal opinions, and scholarly legal commentary relating to digital transactions.

Documentary review of reports by international financial institutions (e.g., World Bank, IMF), e-commerce market analyses, and cybersecurity standards.

Case-driven evaluation, referencing real-world examples of digital payment adoption by e-commerce platforms and banking institutions.

The approach aims to establish a deeper understanding of both regulatory frameworks and practical realities associated with electronic payment mechanisms in a digital economic environment.

Author Contributions

Hairech Noureddine

Developed the conceptual framework of the article, conducted legislative analysis, prepared theoretical and definitional sections, and performed comparative legal evaluation.

Teldja Badra

Conducted literature review, drafted analytical and empirical sections, refined definitions and classifications of electronic payment instruments, and contributed to manuscript editing and academic coherence.

Both authors reviewed and approved the final version of the manuscript.

Ethical Considerations

This study does not involve human subjects, personal data, or experimental testing. All legal texts, academic sources, and reference materials are publicly accessible. The work adheres to principles of academic integrity, intellectual transparency, and responsible citation practices.

Acknowledgements

The authors express their gratitude to the Faculty of Law and Political Science at the University of Mascara for academic support and encouragement, and to colleagues who provided constructive dialogue and insights regarding digital legal transformation.

Funding

No external funding was received for conducting this research. The study was carried out using the authors' institutional academic resources.

Conflict of Interest

The authors declare that there are no conflicts of interest — financial, academic, institutional, or personal — that could have influenced the outcomes or interpretations of this research.

References

1. Abdelsamad Hawalef, *The Legal System of E-Payment Means*, PhD, University of Tlemcen, 2014/2015
2. Al-Laham, M., Abdallat, N., & Al-Tarawneh, H. (2009). Development of electronic money and its impact on the central bank role and monetary policy. Issues in Informing Science and Information Technology, 6(3), 339–349.
3. Al-Saidi, K., & Al-Tamimi, S. (2022). Electronic payment adoption and the sustainability of economic growth: Evidence from Gulf countries. Journal of Financial Regulation and Compliance, 30(2), 195–214. https://doi.org/10.1108/JFRC-06-2021-0098
4. Amoroso, D., & Lim, R. (2017). Exploring digital payments adoption in the Philippines. Asia Pacific Journal of Innovation and Entrepreneurship, 11(2), 203–222. https://doi.org/10.1108/APJIE-08-2017-030
5. Anderson, R., Shumailov, I., Ahmed, M., & Hicks, M. (2020). Electronic payment fraud: The ongoing battle for secure transactions. Communications of the ACM, 63(2), 72–81. https://doi.org/10.1145/3336147
6. Arner, D. W., Barberis, J., & Buckley, R. P. (2016). FinTech and regtech: Impact on financial regulation. Journal of Banking Regulation, 19(4), 1–14. https://doi.org/10.1057/s41261-017-0037-3
7. Baldwin, R. (2019). The connected economy: How digital platforms change global markets. MIT Digital Economy Review, 34(1), 22–46.
8. Bhatt, C. (2021). Digital wallets and consumer payment decisions: A behavioral economic perspective. Electronic Commerce Research, 21(4), 855–874. https://doi.org/10.1007/s10660-020-09442-1
9. Carbó-Valverde, S., & Rodríguez-Fernández, F. (2019). Regulation of digital payment services: Central bank perspectives. Journal of Payments Strategy & Systems, 13(3), 226–245.
10. Dahlberg, T., Guo, J., & Ondrus, J. (2015). A conceptual framework for mobile payment adoption. Electronic Commerce Research and Applications, 14(5), 299–312. https://doi.org/10.1016/j.elerap.2015.03.001

11. Deakin, S. (2020). Law, technology and the digital economy: Legal challenges of digital transaction systems. Cambridge Journal of Economics, 44(4), 837–858. https://doi.org/10.1093/cje/beaa014
12. European Central Bank. (2022). Digital euro: Investigation phase and policy implications. Eurosystem Publications.
13. Farouk S. Hussein, *E-Commerce and Its Security*, Giza, 2001
14. Gomber, P., Koch, J-A., & Siering, M. (2017). Digital finance and fintech: Current research and future research directions. Journal of Business Economics, 87(5), 537–580. https://doi.org/10.1007/s11573-017-0852-x
15. Haiza Hadaf, *Success of E-Payments and European Experiences*, Journal of Scientific Research, Vol. 8, No. 2
16. Hassina Cheron & A. H. Ben Mshari, *Legal Protection for E-Payment Cards*, Journal of Judicial Ijtihad, Vol. 12, No. 1, March 2019
17. Hien, N. T. T. (2022). Digital economic development in Ho Chi Minh City in the current period. Bank and Policy, 2(1). https://bankandpolicy.org/open-access-archive/10-bank-and-policy-vol2-issue-1-2022.html
18. International Monetary Fund. (2021). Cashless payments and macroeconomic stability in emerging economies. IMF Working Paper 21/118.
19. Khiaonarong, T., & Humphrey, D. (2019). Cash use across countries and the demand for central bank digital currency. IMF Working Paper 19/143.
20. Law No. 18-05 (May 10, 2018): E-Commerce Law (Official Journal No. 28)
21. Lee, I., & Shin, Y. (2018). Fintech: Ecosystem, business models, investment decisions, and challenges. Business Horizons, 61(1), 35–46. https://doi.org/10.1016/j.bushor.2017.09.003
22. Lemaire, J. (2020). Digital trust and legal responsibility in online financial transactions. Computer Law & Security Review, 37, 105–126. https://doi.org/10.1016/j.clsr.2019.105405
23. M. H. Mansour, *Electronic Liability*, Alexandria, 2008
24. M. H. Mansour, *Traditional and Electronic Sales & Consumer Protection*, Alexandria, 2006
25. Majid M. A. Abalkhail, *The Electronic Contract*, Riyadh, 2009
26. Mamadi, S. (2018). Electronic payment systems in Algeria: Constraints and prospects. African Journal of Economic and Financial Law, 12(2), 114–131.
27. Nadler, A. (2022). Digital identity and fraud prevention in financial services. Journal of Cybersecurity, 8(1), 1–16. https://doi.org/10.1093/cybsec/tyac001
28. Nazarov, B. (2022). Power in the world on the basis of "similar scenarios" changes (Eastern Europe, CIS, Middle East and Africa). Bank and Policy, 2(1). https://bankandpolicy.org/open-access-archive/10-bank-and-policy-vol2-issue-1-2022.html
29. OECD. (2020). Digital disruption in banking and finance: Policy challenges and innovation strategies. OECD Publishing.
30. Slozko, O., & Pelo, A. (2015). Problems and risks of digital currency in the context of financial globalization. Business Systems and Economics, 5(1), 21–32. https://doi.org/10.13165/VSE-15-5-1-03
31. World Bank. (2023). Digital financial inclusion and sustainable development in emerging economies. Washington, DC.
32. Xiang, G., Huang, X., & Yu, X. (2021). Blockchain-based payment security and cross-border electronic transactions. Computers & Security, 110, 102437. https://doi.org/10.1016/j.cose.2021.102437
33. Yadav, U. S. (2022). Performance of women in MSMEs during the pandemic COVID-19 in India: Strategies for developing the handicraft sector with artisan as entrepreneur. Bank and Policy, 2(1). https://bankandpolicy.org/open-access-archive/10-bank-and-policy-vol2-issue-1-2022.html
34. Zakaria Masoudi & Zahra Jarkif, *The Nature of E-Money*, International Journal of Legal and Political Research, Vol. 2, No. 3, Dec 2018