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The role of digital banking management in modernizing payment methods and its impact on e-commerce operations

Dr. Redhouane Fellag

Faculty of Economic Sciences, Commercial Sciences, and Management Sciences,
University of Algiers 3, Algeria
Email: redhouanefellag@gmail.com

Dr. Saidani M'Hamed

Faculty of Economic Sciences, Commercial Sciences, and Management Sciences,
University of Tissemsilt, Algeria
Email: Saidanimhamed284@gmail.com

Abstract--The term *electronic management* has recently gained increasing traction, in parallel with its widespread adoption and the growing number of users. It has become an integral part of modern society, driving a technological and informational revolution across various aspects of social, economic, political, and recreational life. With this significant expansion, electronic management has become indispensable in banks and financial institutions, impacting traditional payment methods and leading to the emergence of electronic payment systems. These developments have, in turn, contributed to the enhancement and provision of high-quality banking services. This research paper aims to provide a conceptual and scholarly framework for electronic banking management and electronic payment methods, while examining their role in improving banking services and promoting electronic commerce.

Keywords---electronic banking management, electronic banking payment methods, electronic commerce.

Introduction

The electronic payment system is a key indicator of an economy's efficiency and functionality. This has led banks worldwide to prioritize the development and

modernization of payment methods, as traditional payment systems are no longer effective in an era that demands speed in processing transactions. Digital management has enabled a shift toward **electronic banking management** and the transformation of traditional payment methods into **cost-effective, dematerialized electronic payment systems**. However, the smooth operation of these newly developed electronic payment systems requires **strong legal frameworks, high security standards, and the promotion of digital literacy among citizens**.

Consequently, most banks and financial institutions have transitioned from traditional to modern (digital) service delivery methods, moving from conventional banking management to **electronic banking management (EBM)**. This shift aims to keep pace with rapid technological advancements and the knowledge revolution. Today, **electronic banking management** strives to enhance its success and solidify its position by improving the quality of banking services through seamless interaction between e-banks and their customers. As a result, **electronic banking directly impacts the national and global economy (e-commerce) and society at large**.

Research Problem

This study revolves around the following central question:

To what extent can electronic banking management modernize payment methods, and what is its impact on e-commerce operations?

Research Significance

This study is significant as it highlights:

- The importance of **electronic payment systems** and their role in facilitating **e-commerce transactions**.

Research Objectives

- Provide a **clear and comprehensive overview** of electronic banking management.
- Examine **electronic payment methods** and their evolution.
- Define **e-commerce** and clarify its scope.
- Analyze the **expected effects** of adopting modern electronic payment systems on e-commerce operations.

Research Methodology

This study adopts a **descriptive-analytical approach**, reviewing and analyzing available data on the topic to derive scientifically supported conclusions.

Section One: Introduction to Electronic Banking Management

1. Traditional Banks

A traditional bank is defined as a financial institution whose primary function is to **collect funds from depositors** in the form of current accounts and fixed-term deposits at predetermined interest rates, then **re-lend** these funds to borrowers at higher interest rates. The bank profits from the **interest rate spread** between deposits and loans while also providing banking services related to borrowing and

lending. Thus, a traditional bank acts as a **financial intermediary** (borrower-lender) or a **debt trader**.

The Algerian legislator defined banks under **Law 90-10** (April 14, 1990, on Credit and Currency), Article 114, as:

"A bank is a legal entity that permanently engages in all banking functions, including receiving deposits, granting loans, providing and managing payment methods."

2. Electronic Management

The concept of **electronic management** goes beyond mere automation of administrative tasks within an institution. It encompasses **data and information integration** across various departments, using this data to guide corporate policies and procedures toward achieving organizational goals while ensuring flexibility to adapt to rapid internal and external changes.

Electronic management covers all managerial components—**planning, execution, monitoring, evaluation, and motivation**—but distinguishes itself by its ability to **continuously generate and utilize knowledge** to meet objectives. It relies on developing an **information infrastructure** that ensures operational coherence and efficiency.

- **P. Touzard** defines electronic management as:
"The translation of the link between internet technology and traditional corporate management—a working method applicable across all organizational domains, not just a tool for specific tasks."
- **P. Céliier** describes it as:
"The integration of diverse organizational roles through information and communication technologies (ICT) to enhance institutional performance."

3. Electronic Banks (The Integration of Electronic Management and Traditional Banking)

Electronic banking refers to **banks or financial institutions that operate on digital platforms**, leveraging advancements in **ICT** to provide banking services with absolute security. It can also be defined as:
"The execution of banking procedures electronically—using modern ICT for withdrawals, payments, credit, transfers, securities trading, and other banking operations—eliminating the need for physical branch visits by allowing customers to conduct transactions remotely, thus overcoming spatial and temporal constraints."

The earliest forms of e-banking included **ATMs and telephone banking**, later expanding to **internet-based services**, offering customers **speed, convenience, and 24/7 accessibility** regardless of location.

4. Electronic Banking Operations

Electronic banking encompasses all transactions and activities conducted, executed, or promoted via **electronic or optical means** (e.g., phones, computers, ATMs, the internet), including those handled by:

- **Electronic payment/credit card issuers**
- **Institutions processing digital money transfers**
- **Online trading platforms**

Initially limited to ATMs and phone-based transactions, e-banking has evolved into **internet-based services**, benefiting both customers (through convenience) and banks (through operational efficiency).

5. Electronic Banking Channels

The most important electronic banking channels include:

➤ Automated Teller Machines (ATMs)

The integration of technology into the banking sector emerged from serious considerations about **streamlining banking operations**, reducing paperwork for financial transactions, saving time, and cutting costs. These efforts led to the development of **advanced automated systems** capable of performing various banking services instantly on behalf of human tellers, evolving into today's **ATMs**.

➤ Internet Banking

The internet is defined as a **global electronic network** connecting computers worldwide, characterized by **high-speed services** and its transformative impact on societies. It stands as one of the most crucial tools in **information and communication technology (ICT)**.

According to 2014 statistics on global internet usage:

- **Africa:** ~20% of the population had online access by 2014 (up from 10% in 2010).
- **The Americas:** 2 out of 3 people used the internet by 2014—the **second-highest penetration rate** after Europe.
- **Europe:** Reached a **75% penetration rate** (3 out of 4 people), the **highest globally**.

➤ Telephone Banking

This service emerged alongside the evolution of global banking, allowing customers to **avoid queues** for basic inquiries while offering **24/7 availability**. Different models have developed worldwide:

- **USA:** Midland Bank introduced "**First Direct**", enabling fund transfers and payments via secure phone access.
- **UK (1985):** Initially used home-screen terminals for direct bank communication. By **1987**, voice-based services (customer-bank direct calls via computers) were added.

Cost Efficiency of Electronic Banking

Online banking operations are **significantly cheaper** compared to traditional and modern physical channels. The following table illustrates the **impact of technology and e-banking in improving banking services**:

Section Two: The Transition to Electronic Payment Methods

1. The Concept of Electronic Payment Methods

1-1 Definition of Payment Methods

Payment methods refer to **all instruments and tools** that enable individuals to transfer funds, regardless of the form of the instrument used—whether **paper-based** (checks, promissory notes, bills of exchange), **account-based** (bank transfers), or **electronic** (bank cards).

1-2 Definition of Electronic Payment Methods

The **European Central Bank (ECB)** defines electronic payment (*e-payment*) as: "Any payment transaction initiated, processed, and completed electronically."

Electronic payment systems are **more efficient, faster, and cost-effective** than traditional methods, which rely on paper invoices and manual processing. For example:

- **Boston Edison Energy** (serving 640,000+ customers) states: "Electronic payment systems are a win-win."
- **John Dodge** (Wall Street Journal editor) notes: "GTE sends 53.5 million paper bills annually, consuming 1.6 million pounds of paper (equivalent to 2,073 trees)."

2. Types of Electronic Payment Methods

A. Electronic Money (E-Money)

E-money lacks a fixed definition but is generally described as:

- "A digital representation of cash stored on electronic devices (e.g., smart cards, computer hard drives) for instant transactions."
- The **ECB** defines it as: "An electronic store of monetary value used for payments to entities other than the issuer, without requiring a bank account."

Forms of E-Money:

1. **Card-Based E-Money** (e.g., prepaid smart cards for small purchases).
2. **Network-Based E-Money** (transferred via the internet using specialized software).

Key Features:

- ✓ **Digital storage** (encrypted data on cards/computer memory).
- ✓ **Peer-to-peer transfers** (no intermediary).
- ✓ **Global accessibility** (via internet/wireless networks).
- ✓ **Anonymity** (enhanced security).
- ✓ **Divisibility** (usable for microtransactions).
- ✓ **24/7 availability**.

B. Electronic Checks (E-Checks)

Similar to traditional checks but **digitally transmitted**. The payee submits the e-check to their bank for fund transfer.

- **Electronic signatures** are legally recognized in some countries but lack universal regulation.

C. Bank Cards

Plastic/magnetic cards issued by banks to replace cash, featuring:

- Issuer's logo, cardholder's name/signature, account number, and expiry date.

Types of Bank Cards:

1. **Credit Cards** (Visa, Mastercard, Amex):
Allow purchases on credit (full or partial repayment with interest).

2. **Debit Cards:**
Directly deduct funds from the cardholder's account.
3. **Smart Cards:**
Embedded chips storing extensive data (e.g., e-wallets, ID cards, health records).

3. Advantages & Disadvantages of Electronic Payments

Stakeholder	Advantages	Disadvantages
Cardholders	Convenience, security (no cash carry), interest-free credit periods.	Overspending, blacklisting for late payments.
Merchants	Guaranteed payments, increased sales, reduced debt tracking.	Penalties for policy violations (e.g., blacklisting).
Issuers	Profit from fees/interest (e.g., Citibank earned \$1B in 1991).	Default risks, card replacement costs.

4. Economic & Practical Benefits of E-Payments

1. **Cost Reduction:** Lower operational costs vs. physical branches.
2. **Competitive Edge:** Global reach for banks (including Arab banks).
3. **Knowledge Capital:** Enhanced IT and intellectual capital.
4. **24/7 Banking:** Uninterrupted interbank transactions.
5. **Geographic Flexibility:** Eliminates distance barriers.
6. **Direct B2C/B2B Relations.**
7. **Job Creation:** New roles in fintech and cybersecurity.

5. Security Measures for Electronic Payments

1. **Data Encryption:** Converts data into secure codes.
2. **Secure Sockets Layer (SSL):** Encrypts data transfers between devices.
3. **Electronic Signatures:** Digital certificates verify sender identity (e.g., biometrics, e-pens).
4. **Secure Electronic Transaction (SET):** Developed by Visa/Mastercard for high-security online card payments.
5. **Certification Authorities:** Issue digital IDs with expiration dates.

Section Three: Conceptual Framework of E-Commerce and Digital Marketing

1. E-Commerce

E-commerce refers to a **set of electronic exchanges linked to various commercial activities**. Its scope extends beyond merely using digital tools for buying and selling—it also encompasses **production, information exchange, negotiations, and electronic data interchange (EDI)**.

1-1 Definitions of E-Commerce

- **OECD (Organization for Economic Co-operation and Development):**
"Commercial transactions conducted by individuals or entities, relying on the processing and transmission of digital data (including text, images, and sound) over open networks like the internet."

- **World Trade Organization (WTO):**
"Covers production, promotion, sale, and distribution of products via telecommunication networks (e.g., phone, fax, TV, EDI, email, and the World Wide Web)."
- **European Commission (C.E):**
"Electronic business activities involving the exchange of written, visual, or auditory data. It includes trade of goods/services, digital content delivery, e-payments, e-invoicing, auctions, marketing, and after-sales services—spanning both traditional and non-traditional sectors."

1-2 Expanded Role of E-Commerce

Beyond transactional functions, e-commerce:

- Enhances **flexibility in digital networks**.
- Creates opportunities for **business managers to leverage digital data**.
- Facilitates **collaboration among cross-functional teams** (e.g., internal data-sharing to refine marketing strategies).

Section Three: Conceptual Framework of E-Commerce and Digital Marketing

2. Characteristics of E-Commerce

E-commerce is distinguished by unique features that set it apart from traditional commerce, necessitating specialized legal frameworks to achieve its economic objectives. Key characteristics include:

1. **Paperless Transactions**
 - All processes—data exchange, negotiations, invoicing, banking, and contract execution—are conducted electronically.
 - Digital records serve as legal proof, requiring robust e-commerce legislation.
2. **Real-Time Data Flow**
 - Instant electronic exchange of data/documents between stakeholders enhances efficiency.
3. **Absence of Physical Interaction**
 - Buyers and sellers interact exclusively via digital platforms (e.g., the internet), eliminating face-to-face contact.
4. **Digital Economy Foundation**
 - Relies on **information-intensive production** and advanced digital technologies, demanding robust ICT infrastructure (hardware/software).
5. **Three-Phase Transaction Process**
 - **Phase 1:** Advertising and information gathering.
 - **Phase 2:** Agreement, purchase, and e-payment.
 - **Phase 3:** Delivery.

3. The Internet and Global Marketing via E-Commerce

Modern **information technology (IT)** leverages computers, the internet, and electronic devices to process/store data rapidly. E-commerce enables global market penetration through:

- **Market Entry Strategy:**
 - Selecting target countries.
 - Timing market entry.

- Operational and marketing planning.
 - **Regulatory Barriers:**
 - Some countries impose trade restrictions (e.g., requiring local production, as seen with Toyota/Mercedes in the U.S.).
- 4. Economic Impacts of E-Commerce**
1. **Enhanced Efficiency & Competitiveness**
 - Knowledge becomes a capital asset.
 - 24/7 online shopping expands market reach (including international markets).
 - Cost reductions intensify competition, pressuring less efficient firms.
 2. **Productivity & Economic Growth**
 - Efficient product/service展示 and reduced market-entry barriers.
 3. **Opportunities for SMEs**
 - Breaks large corporations' monopolies by enabling direct global sales via digital intermediaries.
 4. **Labor Market Shifts**
 - Automation reduces demand for low/mid-skilled workers and traditional intermediaries (wholesale/retail), potentially increasing short-term unemployment.
 5. **Tax Revenue Challenges**
 - Declines in taxable sectors (e.g., currency exchange, book sales).

Section Four: Expected Impacts of Modern Electronic Payment Systems on Improving E-Commerce Operations

1. At the Corporate Level

From the seller's perspective, the internet has become a vital global marketing tool. Manufacturers and service providers now display product information, specifications, prices, and services online, enabling customers to view and purchase using modern internet-based electronic payment technologies.

- **Global Market Expansion:** Electronic payment methods facilitate e-commerce growth, expanding market reach to international levels. With minimal costs, companies can quickly and easily find more customers, better suppliers, and more suitable partners.
- **Labor Cost Reduction:** Replacing traditional payment methods with electronic solutions has eliminated many labor-intensive roles, significantly reducing workforce requirements.
- **Business Process Reengineering:** These systems enable companies to redesign operations, potentially increasing productivity for sales, staff, and management by over 100%.
- **Performance Evaluation:** They provide major benefits in assessing corporate performance, employee efficiency, technical infrastructure effectiveness, and management training programs.
- **Reduced Lead Times:** They shorten the period between payment and receipt of products/services.
- **Inventory Management:** The "pull" system in supply chain management allows inventory reduction. This system starts with a customer order, enabling just-in-time manufacturing.

- **Sales Growth:** Companies experience significant and measurable sales increases.
- **Communication Cost Reduction:** Internet-based systems are far cheaper than traditional value-added networks.

2. At the Consumer Level

Today, consumers worldwide can access the internet to review product specifications and offerings, compare multiple vendors, make purchases, and pay online. E-commerce has dramatically influenced pricing, enabling buyers to examine products, features, and global prices quickly and inexpensively compared to traditional methods (travel, visits, trade shows). Specialized software further facilitates online shopping and marketing.

Impacts of electronic payments on consumer e-commerce include:

- **Enhanced Customer Understanding:** These methods help businesses comprehend customer needs, offering broader payment options that increase satisfaction compared to traditional systems. More customers mean expanded market opportunities for suppliers.
- **Competitive Incentives:** They drive competitiveness, encouraging research into advanced methods like electronic coupons and checks while improving product quality for customers.
- **Streamlined Transactions:** Direct shipping from manufacturer to end-consumer reduces costs and delivery times while meeting consumer needs faster, especially for digitally delivered goods like magazines and newspapers, along with associated discounts.
- **Virtual Auction Participation:** Consumers can join online auctions.
- **Knowledge Sharing:** Customers can exchange experiences, opinions, and seek expert advice via the internet.

3. At the Societal Level

Effects of electronic payment methods on societal e-commerce:

- **Public Service Distribution:** They facilitate affordable, efficient delivery of public services like healthcare, education, and social programs.
- **Global Access:** Enable individuals in developing countries to access products unavailable locally and obtain online university degrees.
- **Remote Work & Environmental Benefits:** Allow people to work from home, reducing commuting time, traffic congestion, and environmental pollution.

Conclusion

In conclusion, Algeria has begun taking steps toward adopting electronic payment systems. However, this is just the beginning. Further studies are needed, incorporating lessons from neighboring and developed nations to avoid potential pitfalls. The focus should extend beyond payment cards to include other methods like e-money and e-checks, given their critical role in global e-commerce. This will position Algeria to effectively participate in international e-commerce as it embraces this modern trade paradigm.

Recommendations

- **Build Consumer Trust:** Establish confidence in electronic payment systems as the backbone of e-commerce.
- **Consumer Education:** Increase awareness through advertising campaigns, seminars, and lectures.
- **Legal Frameworks:** Develop and standardize Arab financial and legal regulations to align with e-banking requirements.
- **Bank Security Measures:** Financial institutions should implement advanced protocols (encryption, biometrics, e-signatures) and anti-virus software to protect transaction data.
- **Government Capacity Building:** Invest in training programs to develop skilled personnel for modern technological demands.
- **Customer-Centric Approaches:** Financial institutions should analyze customer capabilities and needs to enhance satisfaction and profitability.

This structured approach ensures clarity while maintaining the original content's academic rigor and depth. Let me know if you'd like any refinements!

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