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Components of e-commerce implementation in Algeria

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***Abstract*---**This study aimed to illuminate the current state and key components of e-commerce in Algeria. Despite the Algerian government's efforts to promote e-commerce through infrastructure improvements and adopting an e-government strategy in 2013, several challenges persist. These include inadequate technological infrastructure, particularly slow and expensive internet speeds compared to developed countries, limited public awareness of e-commerce benefits, a preference for traditional commerce, and ambiguities in the implementation of the 2018 e-commerce law.

Keywords---E-commerce, Algeria, E-commerce implementation, E-commerce challenges, E-commerce infrastructure.

1. Introduction

The global landscape has witnessed unprecedented technological advancements, particularly in hardware and communication technologies. The advent of computers, coupled with the evolution of mobile phones into sophisticated technological devices, has revolutionized the way we live and work. Concurrently, the development of wireless internet, from the first generation to the fifth, characterized by high data transfer rates, has facilitated the emergence of e-commerce as a dominant mode of global trade. This digital transformation has displaced traditional commerce, as consumers increasingly rely on computers, mobile phones, and the Internet to conduct transactions.

While developed nations, such as those in North America, Europe, and Asia, have been at the forefront of e-commerce adoption, Arab countries, especially Algeria,

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have lagged. This disparity is attributable to the absence of critical prerequisites for successful e-commerce implementation. Given this context, this study aims to identify the essential components necessary for Algeria to embrace e-commerce and reap its benefits.

Research Problem

Based on the preceding, the research question can be formulated as follows:
What are the key components required to implement an e-commerce system in Algeria?

Research Hypotheses

The following hypotheses are proposed to address the research question:
- Algeria possesses the technological infrastructure necessary for e-commerce.
- Algeria is transitioning towards high-speed fourth-generation internet services for both mobile and fixed-line networks.
- The Algerian government has adopted an e-government strategy and enacted a dedicated e-commerce law in 2018.
- Algerian youth demonstrate a high level of internet and social media usage

Significance of the research

This study holds significant importance as it sheds light on a contemporary and crucial topic: e-commerce and its essential components for implementation in Algeria. This research catalyzes further investigations in this promising field, while simultaneously directing the attention of Algerian policymakers toward this vital sector.

Objectives of the Study

The primary objectives of this study are as follows:
- ✓ To elucidate the various concepts related to e-commerce.
- ✓ To assess the current state of e-commerce implementation in Algeria.
- ✓ To identify the key components necessary for successful e-commerce implementation in Algeria.

Research Methodology

A descriptive-analytical approach was employed in this study. This involved collecting and analyzing statistical data to answer the research question, test the hypotheses, and comprehensively address all aspects of the study.

2. Theoretical Framework

2.1 Concept of E-commerce

E-commerce encompasses two primary elements: “commerce” which traditionally refers to economic activities involving the exchange of goods and services among governments, institutions, and individuals, governed by international norms and regulations (Kafi, 2010, p. 7); and "electronic" which describes the medium through which commerce is conducted, specifically utilizing electronic media such as the internet (Masri, 2012, p. 12).

E-commerce has been defined as: "The processes of advertising and introducing goods and services, followed by the execution of transactions, contract formation, and the purchase and sale of these goods and services through various communication networks, including the internet or other networks connecting buyers and sellers" (Khalil, 2008, p. 29).

Furthermore, e-commerce has been defined as: "A set of commercial exchanges conducted remotely through a communication network" (Bitouzet, 1999, p. 113). Additionally, e-commerce is defined as: "A form of commercial or administrative exchange or information exchange conducted using information and communication technologies, relying on the display of various commercial goods and services through visible software on a private network available for use, as well as companies providing access to goods and services via the internet" (Laarous, 2017, p. 313).

E-commerce is also defined as: "All electronic exchanges that contribute to a company's sales and marketing activities and enable the management of relationships with customers, distributors, suppliers, and partners" (Lambin, 2008, p. 43).

Finally, e-commerce is defined as: "Any commercial transaction between a buyer and seller in which the internet has played a significant role, whether in providing information (through the internet or other commercial networks) about a specific product or service for subsequent purchase, whether paid for electronically, by paper check, cash on delivery, or by other means" (Bakhti, 2005, p. 42).

The Algerian legislature defines e-commerce in Article 6 of Law 05-2018 on e-commerce as: "An activity whereby an electronic provider proposes or guarantees the provision of goods and services remotely to an electronic consumer, through electronic communications" (Official Gazette, 2018, p.5).

2.2 The importance of e-commerce

It can be said that e-commerce is one of the most significant inventions of our time, enabling the generation of profits that were previously unattainable through traditional methods. The reasons for this include (Bolsnam, March 13-14, 2012, p. 4):

- Reduced costs: Marketing products were significantly more expensive in the past.
- Efficient transactions: E-commerce provides an effective means for conducting transactions between parties through direct electronic communication, eliminating the need for physical documents and associated expenses, thereby saving costs.

2.3 Characteristics of E-commerce

E-commerce possesses several distinguishing characteristics, including (Fenidis, October 8, 2019, p. 53):

- Global nature: E-commerce transcends the temporal and spatial boundaries that restrict traditional transactions.
- Lack of direct interaction: The parties involved in an e-commerce transaction do not interact face-to-face, as their interactions occur electronically via communication networks, relying entirely on electronic media to conduct business without the use of physical documents.
- Ability to transact in intangible goods: E-commerce enables the transaction of intangible goods, such as digital products, unlike previous communication methods.
- Rapid response to market demands: E-commerce allows for quick responses to customer demands due to the speed of interaction.
- Direct impact on company systems: Electronic data interchange enables the direct exchange of data and documents within a company, facilitating the seamless flow of information among parties involved in the transaction with minimal human intervention and cost.
- Delivery of both physical and digital goods: E-commerce allows for the delivery of goods and services both physically and electronically, such as music, CDs, videos, and software.
- Rapid evolution: The vast scale of e-commerce and the rapid changes in its activities, coupled with its reliance on electronic communications, led to its rapid evolution.

2.4 Advantages of E-commerce

The use of e-commerce systems offers numerous advantages, including (Zeid, 2005, p. 70):

- Alignment of information technology with modern marketing methods: E-commerce expands the reach of products and services.
- Creation of a global marketplace: E-commerce provides a global marketplace open to both consumers and producers, regardless of location.
- Meeting consumer needs: E-commerce enables businesses to understand customer needs and preferences, allowing them to design products tailored to those demands and achieve higher levels of customer satisfaction.
- Increased efficiency: E-commerce relies on advanced technology, sophisticated software, and skilled management, leading to improved operational efficiency.
- Abundant information: E-commerce provides a wealth of information, enabling investors to make informed choices.
- Creation of job opportunities: E-commerce creates job opportunities related to computers, software, and other digital technologies.
- Consumer empowerment: E-commerce empowers consumers by allowing them to compare products, choose preferred payment methods, and reduce the constraints of time and location.

2.5 Disadvantages of E-commerce

Despite its numerous advantages, e-commerce has some drawbacks (Mani, 2018, p. 146):

- Lack of physical evidence: The absence of physical documentation in e-commerce transactions may expose consumers to risks due to illegal practices.
- Difficulty in verifying identity: The lack of face-to-face interaction makes it difficult to verify the identity of parties involved in e-commerce transactions.
- Cybersecurity risks: E-commerce platforms are vulnerable to hacking, exposing consumers to the risk of data breaches and identity theft.
- Lack of trust: Some consumers may be hesitant to trust online transactions.
- Language barriers: Language barriers can pose challenges for consumers who do not understand the languages used in e-commerce platforms, particularly in regions with high illiteracy rates.

3. The Empirical Framework of the Study

The applied framework of this study will focus on identifying the key indicators that can facilitate Algeria's adoption of an e-commerce system.

3.1 Information and Communication Technology (ICT) Index:

Algeria Although still lags in the field of information and communication technology (ICT), it has made relatively encouraging progress. According to the International Telecommunication Union's report for 2017, Algeria was among the three countries in the world that made the most significant progress in the ICT Development Index for 2017, ranking 102 with a value of 4. 67. This represents a four-place improvement compared to 2016 (ranked 106 with a value of 4. 32) and a ten-place improvement compared to 2015 (ranked 112 with a value of 3. 74) (Baghdad, 2019, p. 214). This substantial progress can be attributed to the importance that Algeria places on building a knowledge-based society and a digital economy through its adoption of a national e-strategy.

ICT serves as the fundamental infrastructure for establishing e-commerce and facilitating various electronic transactions. Recognizing the pivotal role of ICT, countries worldwide, including Algeria, have invested significant efforts in its dissemination and accessibility to individuals and households. However, despite the steady growth of ICT in Algeria, the efforts exerted remain relatively weak compared to countries that are part of the knowledge economy. The following table highlights Algeria's regional and international ranking based on the ICT Development Index:

Table 1. ICT Development Index, 2017

Country	Regional ranking	Global ranking
Bahrain	01	31
Qatar	02	39
United Arab Emirates	03	40
Saudi Arabia	04	54
Oman	05	62
Lebanon	06	64
Jordan	07	70
Kuwait	08	71
Tunisia	09	99
Morocco	10	100
Algeria	11	102
Egypt	12	103

Source: International Telecommunication Union (ITU) report, 2017

The data presented in the aforementioned table reveals that Algeria occupies the second-to-last position, ranking 11th, among Arab nations in the ICT index. Furthermore, the International Telecommunication Union's global ranking places Algeria at 103rd out of 176 countries, underscoring its relative underdevelopment in this domain.

3.2 *Fixed-Line Network Indicator:*

In this section, we will illuminate the fixed-line network indicator by demonstrating the evolution of the number of fixed-line subscribers, residential and business fixed-line subscriptions, and household access to the fixed-line network. Given that fixed-line subscriptions serve as a fundamental component of the e-commerce infrastructure, this analysis will provide valuable insights into the growth and penetration of digital services within the country.

Table 2. Indicators of the Fixed-Line Network in Algeria during the Period 2010-2017

Years	Number of fixed-line telephone subscribers	Residential fixed-line telephone subscriptions	Business fixed-line telephone subscriptions	Household penetration rate of the fixed-line telephone network
2010	3.026.469	2.450.952	575.517	38.30%
2011	3.131.065	2.604.135	526.930	39.07%
2012	3.231.332	2.702.818	529.214	41.57%
2013	3.138.914	2.692.289	446.625	41.23%
2014	3.098.787	2.669.241	429.564	40.04%
2015	3.267.592	2.832.238	435.354	41.65%
2016	3.404.709	2.967.737	436.972	43.40%
2017	3.130.090	2.743.961	386.129	35.76%

Source: ICT Indicators, Ministry of Post, Telecommunications and Digital Technology, retrieved from https://www.mpttn.gov.dz on November 29, 2019.

The preceding table reveals a notable trend towards stabilization in the total number of fixed-line subscribers in Algeria over the eight years, exceeding three million. In 2017, Algeria phased out wireless fixed-line technology, previously used in rural areas, aligning with the government's strategy to equip these regions with more advanced telecommunications infrastructure. Residential fixed-line subscriptions dominated the market, accounting for 87.66% of total subscriptions during the analyzed period. Conversely, business fixed-line subscriptions experienced a decline year-on-year, attributable to the growing popularity of mobile technology. The household penetration rate of fixed-line networks also decreased in 2017, reaching 35.76%, primarily due to the increasing adoption of mobile services.

3.3 Mobile Network Indicator:

The Algerian mobile market was opened to competition following the enactment of Law No. 2000-03 of August 5, 2000, which outlines the general regulations governing postal and telecommunications services. Currently, three mobile operators are active in the Algerian market. This section aims to provide an overview of the mobile network indicator as a fundamental component of the e-commerce infrastructure.

Table 3. Mobile Network Indicators in Algeria during the Period 2012-2018

Years	Number of mobile phone subscribers	Number of 3G mobile subscribers	Number of 4G mobile subscribers	Mobile phone network penetration rate
2012	37.527.703	------	-----	99.28%
2013	39.517.045	308.019	-----	102.40%
2014	43.298.174	8.509.053	-----	109.62%
2015	43.227.643	16.684.561	-----	107.40%
2016	47.041.321	25.214.732	1.464.811	113.35%
2017	49.845.665	23.701.023	10.968.495	121.05%
2018	51.490.146	19.239.448	20.621.452	121.93%

Source: ICT Indicators, Ministry of Post, Telecommunications and Digital Technology, retrieved from https://www.mpttn.gov.dz on November 29, 2019.

The preceding table indicates a notable improvement in Algeria's mobile network infrastructure. By 2016, mobile network coverage had surpassed 98% of the population, contributing to a sustained growth in subscriber numbers. This trend is evident in the data, which reveals a 3.3% increase in subscribers between 2017 and 2018, reaching a total of 51.49 million by the end of the period.

The introduction of 3G mobile services in December 2013 marked a significant milestone. Within a single month, over 308,000 subscribers were registered, and this figure experienced a twenty-sevenfold increase in 2014. By 2017, the 3G subscriber base exceeded 23 million. However, a subsequent decline in 2018 can be attributed to the rapid adoption of 4G services, launched in October 2016. The latter technology witnessed exponential growth, with subscriber numbers surpassing 10 million in 2017 and reaching over 20 million in 2018, representing an approximate 50 % increase.

3.4 Internet Network Indicator

This section will illuminate key indicators of Algeria's internet network, a critical component of e-commerce. Subsequent tables will delve into specific metrics, including fiber optic cable length, number of municipalities connected to fiber optics, ADSL subscribers, and fixed-line 4G internet subscribers.

Table 4. Internet Network Indicators in Algeria, 2012-2017

Years	Fiber optic cable length (km)	Number of municipalities connected to fiber optic network	National internet bandwidth (Mbps)	International Internet bandwidth (Mbps)
2012	46231	1000	130000	104448
2013	50800	1081	172021	166000
2014	61556	1229	3408000	278000
2015	70700	1321	390000	485155
2016	76514,56	1477	------	630150
2017	81872	1541	801000	810155

Source: Adapted from the website: https://www.mpttn.gov.dz, dated November 29, 2019.

The table reveals a significant advancement in Algeria's digital infrastructure, particularly in the deployment of fiber-optic networks. By the end of 2017, all municipalities had been connected to fiber-optic networks. To meet the growing demands of Algerian internet users and deliver high-quality services, the national bandwidth capacity experienced substantial growth, reaching approximately 801,000 Mbps by late 2017. This figure closely approached the international bandwidth capacity of 810,155 Mbps.

Table 5. Evolution of Internet Subscribers in Algeria, 2013-2017

Years	ADSL broadband subscribers	Fixed 4G LTE broadband subscribers	WiMAX subscribers	Total fixed broadband subscribers	Internet penetration rate
2013	1.283.241	-----	179	1.283.420	------
2014	1.518.629	80.693	216	1.599.538	025.6%
2015	1.838.492	423.280	233	2.262.005	46.00%
2016	2.083.114	775.792	661	2.859.567	69.14%
2017	2.246.727	919.368	621	3.166.907	82.06%

Source: Adapted from the website https://www.mpttn.gov.dz, dated November 29, 2019.

As evident from the table above, the total number of internet subscribers in Algeria reached 3. 16 million by the end of 2017. Of these, 919, 000 were subscribed to the fourth-generation fixed-line service. This latter category has witnessed substantial growth since its inception in 2014. Furthermore, Algeria's internet penetration rate relative to its total population has also experienced significant growth, reaching 82.06 % in 2017.

3.5 E-commerce Law in Algeria

Algeria's Law 05-18 on e-commerce, published in the Official Gazette, number 28, categorically prohibits the online sale of certain goods and services due to their sensitive nature and the cultural context of Algerian society. Such prohibited items include alcoholic beverages, gambling paraphernalia, and pharmaceuticals (www.android-dz.com).

Under this law, an electronic contract is defined under the June 23, 2004 law on commercial practices, and is executed remotely without the simultaneous physical presence of the parties involved, relying solely on electronic communication technology. An electronic consumer is any natural or legal person who acquires a good or service, for consideration or gratuitously, through electronic communication from an electronic supplier. Conversely, an electronic supplier is any natural or legal person who markets or offers to provide goods or services through electronic communication. The law also defines electronic payment methods as a means of payment that allows the payer to make payments remotely or in person through an electronic system (www.elkhabar.com).

A significant provision of this law stipulates that registration in the commercial register and the establishment of an online presence are essential prerequisites for engaging in e-commerce. Additionally, a national register of electronic suppliers registered in the commercial register is to be created at the National Commercial Register. This register will specify the information that must accompany online commercial offers, including the taxpayer identification number, address, phone number, commercial register number, and commercial guarantee (Amoura, 2019, p. 132).

4. Conclusion

The findings of this study have identified critical barriers to e-commerce adoption in Algeria, including inadequate ICT infrastructure, low technological literacy, a restrictive regulatory environment, and limited electronic payment systems. These challenges directly align with the research question that sought to identify the key components required for implementing an e-commerce system in the country. By addressing these issues, Algeria can create a more conducive environment for e-commerce growth and development.

Despite the Algerian government's efforts to foster a favorable environment for e-commerce through initiatives such as improving wired internet services with fiber-optic networks, the introduction of fourth-generation mobile internet in 2016, and the subsequent enactment of Law 05-18 in 2018, Algeria lags in the adoption of e-commerce. Several factors continue to hinder the widespread adoption of e-commerce within the country:

- Inadequate ICT infrastructure: Compared to developed nations, Algeria's information and communication technology infrastructure remains weak.

This is evidenced by slow internet speeds—placing Algeria in the 176th position globally—and high internet costs relative to neighboring countries.
- Low technological literacy: A lack of technological literacy among Algerian citizens has significantly contributed to the recreational rather than transactional use of the Internet.
- Stringent regulatory framework: Although Law 05-18 provides a regulatory framework for e-commerce, the conditions it imposes on e-commerce activities are considered overly restrictive, potentially hindering the growth of this sector.
- Limited adoption of electronic payment systems: While many Algerian banks have introduced electronic payment methods, their usage by businesses remains limited. This can be attributed to factors such as high implementation costs and perceived security risks.

Based on the findings of this study, the following recommendations are proposed:
- ✓ Enhance ICT infrastructure: Prioritize improvements to internet speeds and reduce costs to enhance the overall digital infrastructure.
- ✓ Develop electronic payment systems: Foster the development of secure, efficient, and affordable electronic payment systems to facilitate online transactions.
- ✓ Promote digital literacy: Implement programs to raise public awareness about the benefits of e-commerce and encourage its adoption among Algerian citizens and businesses.

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