

E-payment adoption in the era of digital transformation: the case of Algerian banking system

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Received: 18/05/2022

Accepted: 19/10/2022

Published: 31/12/2022

Abstract:

In the era of digital transformation, shifting to digital banking and adopting e-payments has become a necessity that covid-19 has emphasized. However, some developing countries, such as Algeria, have been late and slow in embracing new technologies. This study, therefore, will assess the current situation and growth of e-payment, by analyzing the latest developments and issues related to it, especially payment infrastructure, focusing on institutional and technological factors affecting its adoption. The study finding shows that the digital infrastructure is less developed and electronic banking services are still in their embryonic stage, despite the quantum leap recorded in its adoption after the pandemic, and Algerian banks still depend on traditional banking services, in an environment where cash culture dominates, with a low level of bancarization and unequal access to digital services.

Keywords: E-payment, digital transformation, ICT, payment systems infrastructure.

JEL Classification Codes: G20, G21, O33

ملخص:

بات التحول نحو الخدمات المصرفية الرقمية ضرورة حتمية في عصر التحول الرقمي، تجلى ذلك بصورة أوضح في ظل جائحة كورونا. ورغم إقبال العديد من الدول على تطبيق هذا المسعى، فإن بعض الدول النامية، ومن بينها الجزائر قد تأخرت في استخدام هاته التقنيات. تحاول هذه الدراسة رصد وضعية الدفع الإلكتروني من خلال تحليل وتقييم آخر التطورات المتعلقة بالتحول الرقمي، مع التركيز على العوامل المؤسسية والتكنولوجية المؤثرة على تبني الدفع الإلكتروني. كشفت الدراسة أن البنية التحتية الرقمية لم تشهد تطورا، وأن الخدمات المصرفية الإلكترونية لا تزال في مرحلتها الجنينية. بالرغم من الجهود المبذولة في هذا المجال، لا تزال البنوك الجزائرية تعتمد على الخدمات المصرفية التقليدية، في ظل هيمنة ثقافة الدفع نقدا، وانخفاض رقعة المستخدمين للحسابات البنكية، مع عدم المساواة في الولوج إلى الخدمات الرقمية.

كلمات مفتاحية: الدفع الإلكتروني، التحول الرقمي، تكنولوجيا المعلومات والاتصال، البنية التحتية لأنظمة الدفع.

تصنيفات JEL: G20, G21, O33

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1. Introduction

The rapid increase in the use of digital technology during recent years has resulted in the digitalization of all sectors of society, particularly the economic and corporate sectors. The digital transformation has derived transformative change and shifted economic paradigms, so no sector of the economy can be neglected. The banking industry has not been an exception to the adoption of these new technologies, which renovated the financial service industry, and changed the way of processing transactions, providing services, and the way businesses are conducted.

Furthermore, the advancement of information technology has provided innovative opportunities for the creation of new business strategies, as well as altered the banking sector by introducing new business dimensions, creating innovative services, and developing electronic payment systems in order to make banking performance more optimal.

In addition to the vital role of digital transformation in economies, the Covid-19 crisis has highlighted its crucial role in society and in promoting greater economic resilience. The pandemic changed the way economies and societies function and had an impact on accelerating the adoption of digital technologies in all areas including financial services. It has given a significant boost to the digitalisation of the banking sector and has amplified the benefit of digital payments, which managed to mitigate the impact of the pandemic and keep vital services functioning during the lockdown.

Due to the sheer requirements arising from this new environment, bank digitization was viewed as an ever-present challenge for the financial industry in both developed and developing countries. Algerian banks have not been insulated from what happens in the international arena, despite their delay in implementing digital services.

Given the importance of bank digitization, as well as its importance and influence on the economy, delivering e-services has become an unavoidable need for bank survival. Thus the development of digital payments and new electronic tools as well as the establishment of an efficient electronic payment system were one of the priorities and the main development goals of the Algerian authorities.

Based on the aforementioned, the present study revolves around the issue of digital bank transformation in Algeria, attempting to decipher the place of electronic payment by addressing the following question:

How does digital transformation influence the Algerian banking sector? And to what extent has electronic payment been adopted?

To answer this question, we divided this work into four parts; the first gives a comprehensive overview of digital transformation in the banking sector, and the second addresses the level of ICT penetration in Algeria as a vital condition to promote electronic banking services. The third part assesses the main efforts made in modernising the banking sector, focusing on the infrastructure payment system and institutions conducting electronic transactions. The fourth is devoted to the analysis of the reality of e-payment adoption and its evolution after the covid-19 pandemic. The study concludes by providing the most important results.

We followed an analytical descriptive approach to the various indicators of electronic payment in Algeria, aiming at investigating institutional and technological factors affecting its adoption through establishing a favourable analytical framework on the basis of statistical data collected mainly from the bank of Algeria and GIE monétique as well as international institutions reports.

2. Digital transformation of the banking sector

The digital transformation phenomenon has been explored in different academic domains, and multiple explanations can be found in the literature. We present in this section different definitions that can remove the ambiguity of this concept with a focus on its economic, financial aspect and the banking industry.

2.1 Definition

The concept of digital transformation is formed by the merger of personal and corporate IT environments and encapsulates the transformational impact of modern digital technologies like social, mobile, analytical, cloud technologies and the internet of things (SMACIT) (Ziyadin, Suieubayeva, & Utegenova, 2020, p. 409). In other words, the use of new and rapidly changing digital technologies to alter business activities, competencies, and business models is known as digital transformation. Almost all modern devices, including computers and cellphones, are digital, they use information in the form of numeric code (liu, 2021, p. 6). It is also identified as a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication and connectivity technologies (Kitsios, Giatsidis, & Kamarioutou, 2021, p. 1).

In the same line of thought, to properly comprehend the meaning of this notion, we must distinguish between the phrases listed below, which are frequently used interchangeably: « digitization », « digitalization » and « digital transformation » by adopting the distinction used by the organisation for economic cooperation and development (OCDE) which define them as follow (Merhej & IFI-Google Policy Fellow, 2021, p. 6):

Digitization is the conversion of analogue data and processes into a machine-readable format.

Digitalization is the use of digital technologies and data..., that results in new or changes to existing activities.

Digital transformation is the economic and societal effects of digitization and digitalization.

Given the crucial role of the banking institution in the economy, great progress has been made worldwide in developing this sector to keep up with this new digital landscape. Thus, banks were among the first in embracing these innovative technologies and moving toward a digital transformation.

Even though the literature does not offer a concise definition of digital transformation in the banking sector, it is related in general to issues such as generating the supply, distribution and sales of financial products and services through digital channels, exploiting high-tech technologies to better understand the customer and anticipate their needs quickly and appropriately, and an omnichannel

solution, or the possibility of customers communicating with their bank via channels, both analogue and digital, as well as the automation of services (Cuesta, Ruesta, Tuesta, & Urbiola, 2015, p. 4).

The digital transformation of the banking industry can be summarised in two dimensions, the first is related to technologies utilised such as the cloud, artificial intelligence (AI), big data analytics, blockchains and robot advisor, alongside the second concerns Services impacted which include payments, lending, asset management and communication (liu, 2021, p. 4).

According to existing definitions, the digital transformation of the banking industry may be characterised as the provision of financial products and services to clients via electronic channels.

2.2 The necessity of digital transformation of banks

In a competitive environment and an area of financial digitalisation, banks have gone through multiple transformations, investing and evolving over time to adopt new technologies and deliver faster services. Thus, digital transformation has become a necessity in the banking sector for the following reasons:

2.2.1 Changing behavioural patterns of the consumer

With the spread of new technologies and the penetration of the internet and mobile devices phones, the financial digitalisation area has shifted and transformed consumers' behaviour and preferences who have adopted digital interaction in several areas of their lives, especially financial services (Cuesta, Ruesta, Tuesta, & Urbiola, 2015, p. 2). As a result, today's consumers are technologically savvy and want banks to not only expedite the financial transaction but also to completely grasp their demands.

2.2.2 Legacy information technology IT systems

The consumer expects immediate access to products and services. Banks have also realised that their IT assets are not sufficient to support the rapid changes taking place on the front end of their business. Therefore, the banking sector needs to organise its environment and processes to manage risk and create an IT environment capable of responding to the new service landscape.

2.2.3 The emergence of new competitive fields

While there is no single fintech threatening the incumbent banking businesses, The banking industry is worried about shrinking market share. This is amplified by venture capitalists whose investments in fintech increased by 120% year over year to 40 billion dollars in 2018 (Infosys knowledge institute, 2019, p. 3)

These fintech companies have burst into the financial sector and exploited the gap between new customer demands and sometimes outmoded services offered by traditional banks, and dismantled the value chain of banks by specialising in their various components, such as payments, foreign exchange, lending, and financial advisory services.

Furthermore, the most important internet companies such as Apple, Google, Amazon and Alibaba have also made their way into the financial sector by offering services of this kind, particularly in the areas of payments and lending. Not only that, but organisations from other industries, such as mobile phone companies, are seeking

new revenue lines centred on financial services, and they have begun offering payment services through these services.

These new competitors are very flexible, tend to require a low-cost structure and often present redefined business models that lead to a major disruption to traditional models (Cuesta, Ruesta, Tuesta, & Urbiola, 2015, p. 3).

Therefore, it becomes a necessity for banks to accelerate their digital transformation and to be more agile in order to maintain a competitive edge and remain relevant to consumers in the race against fintech companies.

3. The ICT level penetration in Algeria

A transition from conventional to digital banking is conditioned by integrating information and communication technology ICT, which necessitates a change in the technology platform to enable the development of new products and the integration of new technologies. Thus, improvement in ICT becomes an urgent need for developed and developing economies alike. In Algeria as well, investment in ICT turned out to be a strong policy investment and the use of these technologies is at the centre of Algerian authorities.

To benefit from digital transformation and allow the necessary increase in internet traffic, the digital infrastructure must be sufficiently developed, particularly mobile and fixed broadband infrastructure. Well-developed mobile broadband, comprising remote areas, but also built on fibre optic networks is vital to provide high-quality services. In addition to that, and in order to avoid concentrating all the traffic on mobile networks, the fixed broadband infrastructure should also be developed, mainly in urban areas, to better meet the needs of enterprises and administrations (World Bank Group, spring 2020, p. 18).

Algeria has experienced an improvement in ICT since 2000, which coincides with the creation of the regulatory authority of post and electronic communications (ARPCE). The latter is an independent institution with legal personality and financial autonomy, established by the law 2000-03, which was replaced by law n 18-04 of May 10, 2018, laying down the general rules relating to the post and electronic communications. (The Regulatory Authority of Post and Electronic Communications (ARPCE))

Consequently, Algerian's ranking on the index of mobile connectivity (105.8%) has improved, with 59,6% of the population connected to the internet (26.3 M), especially among youth people (median age 28.6), who mostly (74%) concentrate in urban areas (DAAS.e.V, DIGITAL Arabic ntwork, december 2020, p. 9).

Although Algeria has recorded significant progress in the development of the ICT sector in recent years, its penetration in the national economy remains poor, which is clearly visible through the following statistics and indicators.

According to the network readiness index NRI (2020 version) which is one of the leading global indices on the application and impact of ICT in economies around the world. Algeria is ranked 120 in the ICT regulatory environment indicator and 108 (out of 134) in the technology pillar indicator, which are considered among the economy's weakest indicators (Portulans Institute NRI, 2020, p. 1).

Not only that, 75% of Algerian families lack access to the internet at home, with a large gap in internet access at home between the richest and poorest families. Furthermore, Access to digital services is unequal, which limits progress toward a more inclusive digital economy. In addition to that Women, less educated individuals and those living in remote areas have less access to ICT, which is still limited by the lack of affordability (World Bank Group, spring 2020, p. 19).

In addition to that, digital content and services are less developed. The Broadband networks are confronted with recurrent service disruptions, providing consumers with low service quality.

Although Algeria has made an important public investment in the evolution of fibre optic networks, the sharing of infrastructure between market players remains limited for two principal reasons. First, the importance of Algerie telecom is not well regulated to allow competitors access under plausible conditions. The second is that the national company for Algerian telecom infrastructure (COMINTAL/CITA) deals only with Algerie telecom.

At last, despite all these deficiencies, the Algerian government recently launched an ambitious plan, a digitization reform program that requires improvements in digital infrastructure. A new digital agency and a national digital strategy have been launched, and the 2020 government action plan intends to improve the performance of public administrations, including through improved digital services. The plan also addresses the need to improve existing infrastructure and increase investment in the population's access and affordability of internet services (World Bank Group, spring 2020, p. 19).

4. Algerian banking system modernisation

The Algerian banking sector has undergone several changes as a response to the spread of the digital landscape worldwide, so it has been engaged in a program of reform in order to modernise the banking system, with a focus on the payment system infrastructure and the creation of institutions aiming at conducting and promoting electronic transactions.

4.1 Modernization of payment systems infrastructure

The bank of Algeria has undertaken a policy of developing and modernising the payment systems since 2003, in coherence with the governmental orientation taking into consideration the universal recommendations of the committee of payment and settlement system of the bank for international settlements. The objective was to set up two modern and efficient interbank systems (ARTS, ATCI) in order to ensure efficient, safe, fast and secure fund transfers, and improve monetary transmission channels. The achievement of these objectives led to the realisation of the following elements (Bank of Ageria, Juin 2007, p. 106):

The Development of payments standards and norms as a crucial precondition for the modernization of mass payments.

Modernization of the Algerian bank information system is a necessary complement and support to the payment systems and the processing of monetary policy operations.

Strengthening the telecommunications infrastructure between the Bank of Algeria and the head office of each bank, Algerie poste, the public treasury and central depository, will result in the creation of a safe, reliable and secure transmission system.

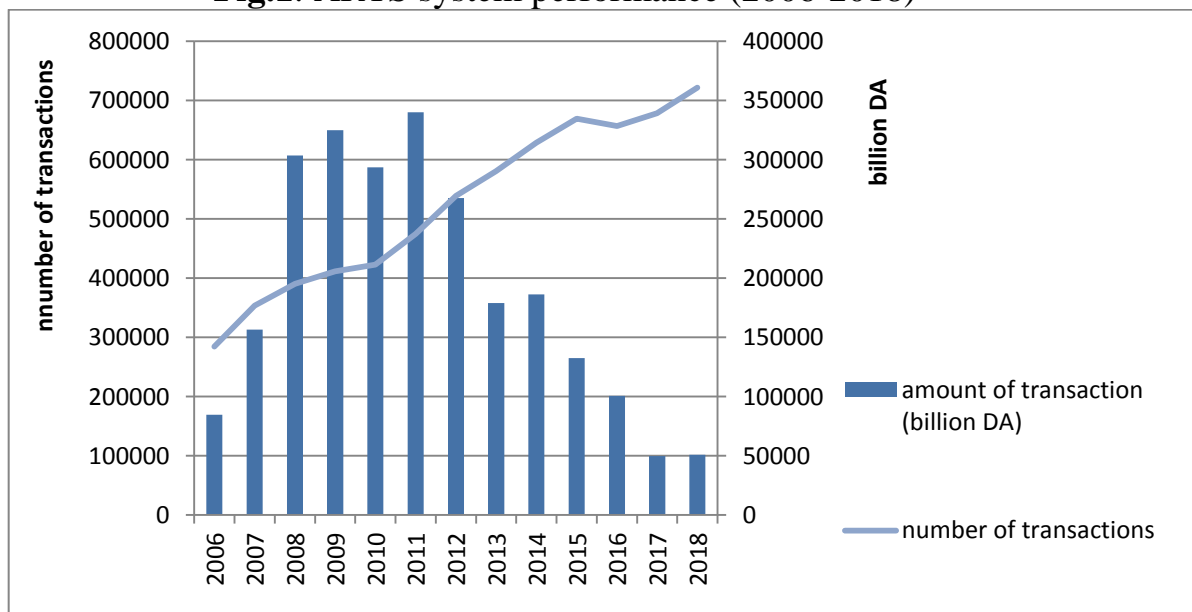
Establish an infrastructure that enables the greatest efficiency in the processing of interbank and financial market transactions.

4.1.1 The real-time GROSS settlement system of large amounts and urgent payment

It was set up by the Bank of Algeria and called the Algeria Real Time Gross Settlement System (ARTS). It is an inter-bank settlement system of payment orders through the bank or postal transfers of large amounts or urgent payments made by participants to this system. The inter-bank payment operations within this system consist of gross transactions that take place in real-time in settlement accounts opened in the system to participants. The Opening of settlement accounts is subject to agreements between the Bank of Algeria and the concerned participants (Bank of Algeria, 2005, p. 9). This system handles payments equal to or greater than one million dinars. Even though this system has been in operation since 8 February 2006, it doesn't reach its full availability ratio of 100% (real functioning of 8 hours per working day) till 2015, the tenth year of ARTS system operation (Bank of Algeria, novembre 2016, p. 82).

For more clarification, we point out the evolution of ARTS system performance from its first year of operation till 2018, as it is shown in the following figure.

Fig.1: ARTS system performance (2006-2018)



Source: by the researcher based on Algeria bank reports (2006 - 2018)

The figure shows a continuous increase in the number of transactions from 142373 (in 2006) to 360919 (in 2018), which is considered to be a good indicator regarding efforts made in this area. The amount of transactions showed an upward trend from 2006 to 2012, while it records a consecutive decline in the value of

transactions from 2012 to 2017 -except for a slight increase of 4% in value in 2013- to rise slightly again in 2018.

According to the annual reports of the bank of Algeria, the decrease in the amount of transactions is due to the operations between participants in the system and the strong decline recorded in monetary policy operations, especially in 2017, when it decreased by 50.5% in value. It recorded again a slight increase in value by 1,73% due to the operations of the Bank of Algeria, explained, in particular, by the significant increase recorded in operations over government values reaching a total of 5987,830 billion dinars, an increase of 55,76% compared to the previous year 2017.

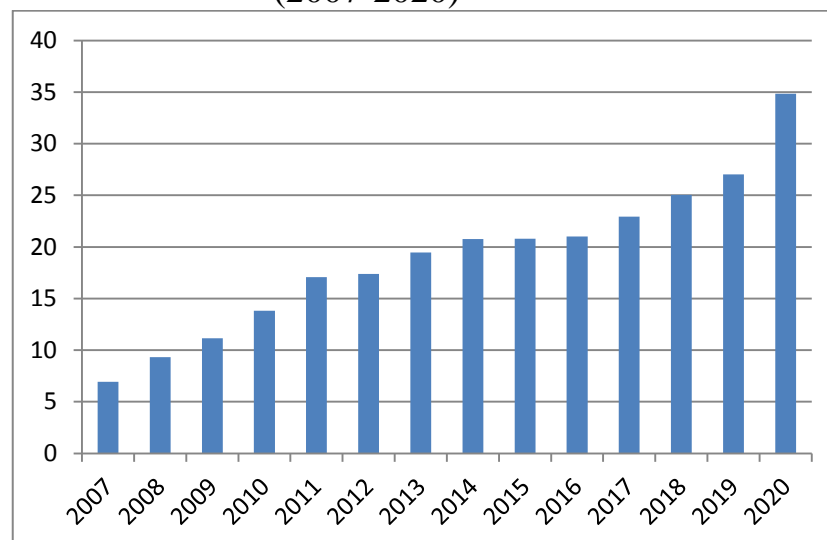
4.1.2 Interbank clearing system (ATCI)

It is an electronic interbank clearing system for cheques, securities, bank transfers, direct debits and payment with bank cards. This system accepts only bank transfers with a nominal value of fewer than one million dinars. Even though it has been in operation since 15 May 2006, the manual clearing houses remained open to treat non-standardized cheques and other payment instruments. The last manual house was closed in early 2012.

The ATCI system is managed by Interbank pre-clearing centre CPI. The latter is the technical operator of the Algerian tele-clearing system, it was created in 2004, it is a shareholding company and a branch of the bank of Algeria and includes all the banks presented in the financial markets as well as Algerie poste and its capital shall be opened to all participants to the system (Bank of Algeria, 2005).

To better understand the functioning of the ATCI system, it's useful to analyse the evolution of the number of transactions, as it will be shown in the following figure.

Fig.2: The evolution of the number of transactions processed by the ATCI system (2007-2020)

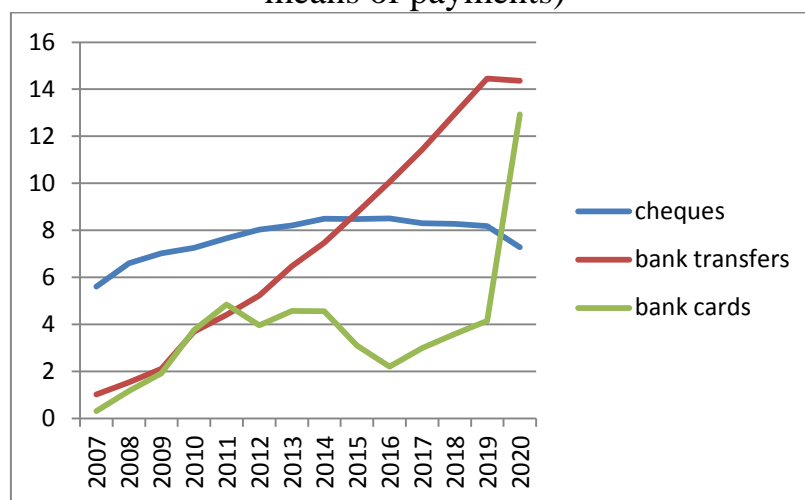


Source: by the researcher based on the Algeria bank reports (from 2006 to 2018) and statistical bulletins of CPI (2019-2020)

The above figure shows a continuous rise in the number of transactions processed by the ATCI system from 2007 to 2020. Even though the gradual increase recorded, should be considered a good indicator, the bank of Algeria report of 2015

pointed out that the volume of transactions processed by the ATCI system remained much lower than the volume processed by payments systems of similar and neighbourhood countries. This is due in particular to the public banks' possession of wide network agencies, where the intra bank payments are very large and represent more than five times the volume of interbank payments (Bank of Algeria, novembre 2016, p. 84). Explaining the significant rise recorded from 2018 to 2020 requires the analysis of the number of transactions evolution (as it is shown in figure 3) according to the type of means of payments processed by the ATCI system, neglecting commercial papers and direct debit, because they constitute a very small percentage of the total transactions.

Fig.3: Number of transactions processed by the ATCI system 2007-2020 (by type of means of payments)



Source: by the researcher based on Bank of Algeria reports 2007-2018 and statistical bulletins of CPI (2019-2020)

We notice from the graph, an upward trend of the transactions processed by these three means of payment, with the predominance of cheques since the launch of the system till 2015. Bank transfers have also noticed a sharp increase and exceeded the use of checks since 2015. While the number of transactions operated by bank cards fluctuated slightly between rising and falling, it recorded a quantum leap in 2020. The upward trend of using bank cards has been justified by the bank of Algeria in its report of 2018 as follows:

Efforts made by GIE in the context of upgrading the card services and strengthening its use.

Approval of e-commerce websites operating in the service sector.

The promulgation of electronic commerce law in May 2018, will allow in the medium term a massive presence of e-commerce websites, which will be reflected in the widespread use of e-payments (Bank of Algeria, decembre 2019, p. 73).

What should be noted, is that despite the relative decline in the number of cheques transactions, their amount remains very high and constitutes the highest percentage (Corresponding 87.26% in 2019, 84.95% in 2020 of the total transactions) compared to other means of payments.

By the same token, bank cards, despite the increase recorded in the number of transactions, their amount remains the lowest value estimated at 1.33%, which reflects the weak adoption of e-services in the banking sector.

4.2 Institutions conducting electronic transactions

Electronic services in Algeria depend fundamentally on three companies AEBF, SATIM and GIE monétique. We focus in the following part on SATIM and GIE which are making important strides in conducting and modernising the electronic banking platform.

4.2.1 SATIM: the company of automation of interbank transactions and electronic banking.

SATIM is the only interbank electronic operator for domestic and international cards, it was first created in 1995 by the banking community. It is one of the technical instruments which accompany the development and modernization program of banks with the goal of promoting different means of payment, particularly card payments. It encompasses 19 members (SATIM).

SATIM works towards the development and the use of electronic payment instruments by implementing and managing technical and organisational platforms to ensure interoperability between all the factors of the electronic payment network in Algeria. It is responsible for Setting up all the measures which govern the functioning of the electronic banking system in its diverse components such as control of technologies, automation of procedures, and speed of transactions. It guarantees the connection and management of ATMs, and the personalization of interbank withdrawal cards for banks (SATIM).

In recent years, SATIM has experienced significant development and sustained growth in its services, and more Automated Teller Machines are connected to its servers. In addition, more than 180 web merchants are operational on its platform.

4.2.2 GIE monétique: Economic interest grouping of electronic banking.

GIE monétique was created in June 2014 to regulate the interbank electronic payment system and its interoperability with local or international electronic payment networks, and to promote financial inclusion. It consists of 19 members including 18 banks and Algerie poste. The Bank of Algeria participates as a non-adhering member to ensure the security of systems and means of payment.

To meet its objectives, GIE defined a set of development axes to be implemented:

Generalising the use of modern means of payment, and launching mobile payment.

Establishing the interoperability between the Edahabia Card of Algerie post and CIB interbank card.

Replacing the current specifications of the CIB card with white label specifications.

Upgrading of adherents to international standards.

Implementing a security charter and a risk map aimed at securing transactions and preserving the relevant data (GIE monétique).

From the above, GIE monétique aims to promote the adoption of electronic payments through the development and implementation of technical standards and regulations in order to generate the use of modern means of payment. This will promise the standardisation of electronic banking systems and products.

5. The reality of E-payment adoption in Algeria

Before addressing the reality of adopting electronic payment in Algeria, it is worth noting first its definition. Electronic payment can be understood as a payment mechanism using electronic media that doesn't evolve cash. Thus it can be defined as an electronic value transfer of a payment from the payer to the receiver via an electronic payment mechanism. The e-payment service is available through a web-based user interface that permits customers to access and manage their bank accounts and transactions remotely. Electronic payment systems are now commonly used such as transactions via ATM machines, uses of credit or debit cards through online and mobile banking (Fatonah, Yulandari, & Wibowo, 2018, p. 2)

In Algeria, the interbank electronic network has undergone several changes over the years, from carrying out the first interbank withdrawal transactions on an automatic teller machine (ATM) in 1977 to the first interbank payment operation on TPE in 2005 (Merbouhi & Hadid, 2017, p. 22), till the official launch of online payment in 2016.

We try in this part to evaluate the current state and growth of electronic payment in Algeria by analysing the main indicators that allow the exchange of money and processing a transaction electronically. Furthermore, we point out efforts made in promoting e-payment by setting up website merchants.

5.1 E-payment cards:

Since the platform of Algerian electronic payment is mainly based on the use of the CIB and Edahabia card, it's vital to know first the number of cards issued before moving on to other electronic tools.

The number of payment cards issued in 2021 reached 11.609.624, increasing by 1.988.607 additional ones compared to the previous year (9.621.017 cards issued in 2020), corresponding to an increase of more than 20%. These cards are distributed as follows:

1.530.403 CIB cards, 82.671 corporate cards, 1.155.211 saving cards, and 8.841.339 Edahabia cards (GIE monetique, 2021, p. 3).

From the above division, we notice that bank cards represent only 24% of the overall number of cards in circulation, against 76% of the existing park issued by Algerie poste, which is considered to be a small share in the cards park. Furthermore, the rate of cardholders represents only 40% of the number of current accounts opened in banks and Algerie poste, estimated by GIE monetique at 29.127.921 accounts which constitutes a rather small percentage, reflecting bank's reliance on traditional methods in their transactions.

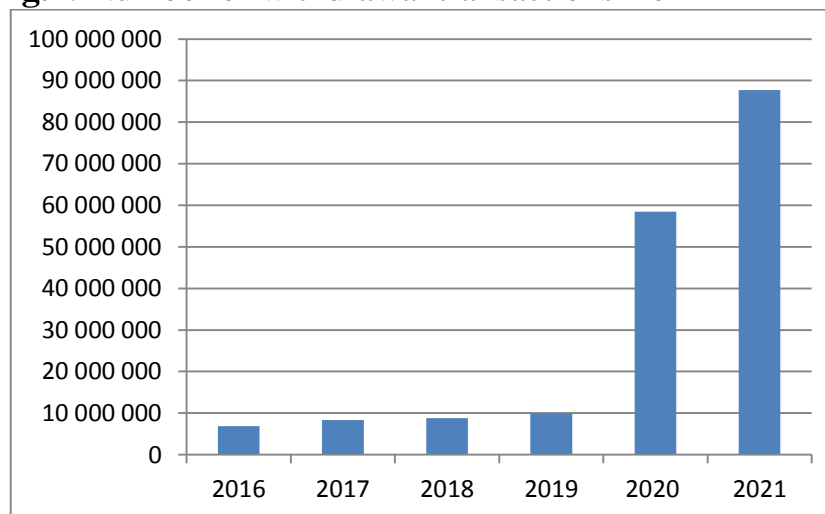
In addition to this low rate, only 42.8% of Algerian people have bank accounts (DAAS.e.V, DIGITAL Arabic ntwork, december 2020, p. 9). This low bancarization level would explain in part the delay in electronic payment.

5.2 ATM withdrawal transactions

The relative increase in the number of interbank cards in circulation was accompanied by an increase in transactions carried out on an automatic teller machine. This rise was achieved despite stagnation in the installation of ATM devices, which registered a slight increase of 0.76% in 2021 compared to 2020 reaching 3053 ATMs according to the GIE database.

The withdrawal activity witnessed a modest upward trend from 2016 to 2019, before recording a quantum leap in both 2020 and 2021, corresponding to an increase of 448%, 50% respectively in the number of transactions, corresponding to almost 48 million additional transactions (in 2020) and 30 million transactions in 2021.

Fig.4: Number of withdrawal transactions from ATM



Source: by the researcher based on the GIE database

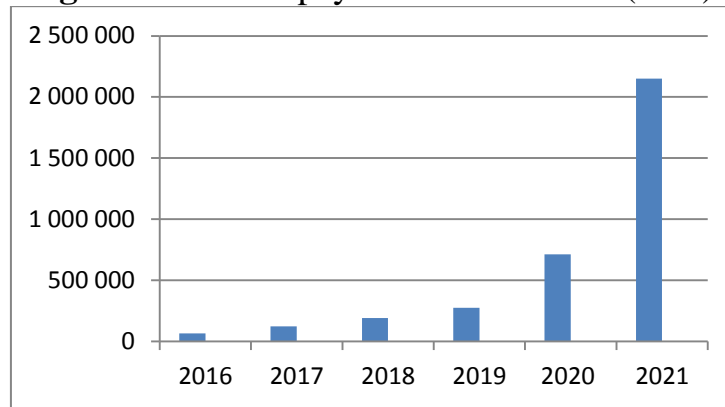
This increase is partly justified by a change in the behaviour of Algerian cardholders who are increasingly withdrawing from ATMs to the detriment of the habit of withdrawing from the post office or bank counters, particularly after the launch of the interoperability and the covid-19 pandemic (GIE monétique, 2021, p. 5).

5.3 Payment activity on TPE: electronic payment terminals

Since the official launch of online payment, the park of electronic payment terminals TPE noticed a continuous increase in the installation of these devices, reaching 37561 devices in 2021 (divided between banks 85% and postal centres 15%), which was reflected in a considerable rise of both the number and amount of payment transactions (444.508.902,40 DZ in 2016 to 15.113.249.499,92 DZ in 2021) (GIE monétique).

The figure below shows the number of transactions carried out through TPE. An important leap has been recorded between 2020 and 2021 (an increase of around 202.13%) due to the agreement of interoperability between Algerie poste and the interbank network.

Fig.5: Number of payment transactions (TPE).



Source: by the researcher based on the GIE database

As shown in the figure, the significant increase in the use of TPE in 2021 denotes the gradual adherence of households to the means of payment which are made at their disposal, and renewed confidence in the reliability of the payment system, Which was boosted in particular by the enthusiasm for this type of ideal transaction in the context of the pandemic

Despite this increase, the park of TPE is largely below the needs of the market, compared to the number of traders registered at the national centre of the commercial register estimated at more than 2 million traders (APS, 2021) and the majority of target populations (holders of e-payment cards). This low rate was justified by The low adherence of traders because of the easy traceability of commercial transactions, and the TPE prices (which are considered high). Not only that but also because of the high operating and maintenance costs associated with TPE, The lack of specialists in the installation and maintenance of TPE. (GIE monétique, 2021, p. 6).

5.4 Online payment activities

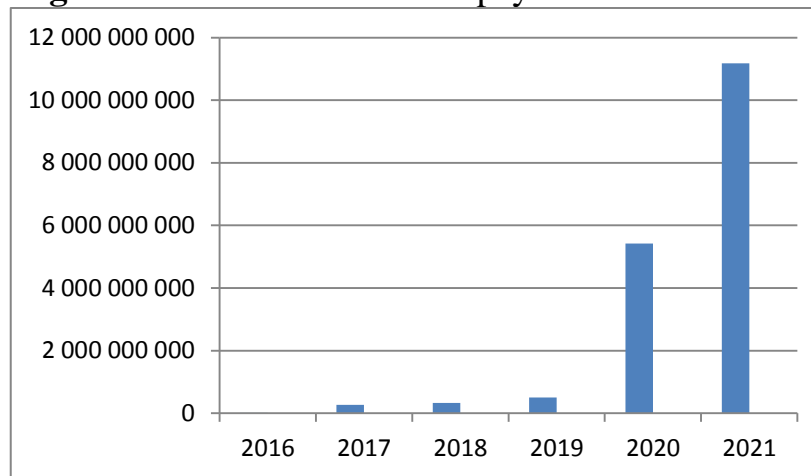
Algeria's first online payment service was launched in October 2016 by 11 banks and nine companies. In addition to six public banks (BADR, CPA, BDL, BNA, BEA, CNEP), five private banks participate: trust bank, Natixix, Société Generale, Gulf Bank and Al Baraka. These were joined by a range of public and private firms including Air Algerie, Algerie telecom, Mobilis, Societe des eaux et de l'assainissement d'alger, Djezzy, ooredoo and Amana assurances, Tassili airlines, CNAS. (Refafa, 2020, p. 302)

Since the launch of online payment services, the number of institutions taking part has risen and many companies have joined the system. The number of web merchants subscribed to the internet payment system by interbank card exceeded 180 (till March 2022), with more than 14 million transactions processed from the launch of online payment till March 2022 (GIE monétique).

Furthermore, the agreement on the launch of electronic payment service through the interoperability between Algerie poste, GIE monétique and SATIM which has been in operation since 5 January 2020, had reinforced the widespread use of electronic means of payment. Thanks to This mechanism of interoperability between postal and banking networks, electronic payment activity are carried out through both holders of Edahabia and interbank card, this has been reflected in the overall amount

of online payment that recorded a considerable evolution, an increase of 106% in 2021 which is illustrated by the following figure.

Fig.6: The evolution of online payment activities



Source: by the researcher based on GIE database

The figure above shows a very slight increase from 2016 to 2019 before ramping up quickly over the last two years. This increase is also due (in addition to the previous explanation mentioned above) to the procedures of integrating commercial websites into the online payment platform.

In this context, GIE monétique launched on 4 April 2021 an electronic payment integration platform Cibweb (to incorporate merchants for online payment and sale) which has greatly accelerated the process of integrating merchants into an online payment platform. This new e-service enables merchants, institutions and even craftsmen, who wish to register, to authenticate, and obtain technical and legal conformity for e-commerce, and to avoid all constraints associated with the manual processing of files, which was considered as an obstacle to the development of this service (GIE monétique, 2021, p. 9).

What should be noted, is that despite all efforts made to promote e-commerce and payment, 2019 statistics (DAAS.e.V, DIGITAL Arabic network, december 2020, p. 12) pointed out that only 4.6% of the population makes online purchases, and cash on delivery is considered to be the best method for e-commerce.

Even though the introduction of financial technology, Algerian banks are still relatively unsophisticated in their use of digital tools, in an environment where cash culture dominates, despite the change of consumer behaviour who tend to contactless payments after covid-19. Thus the innovation in the banking market is still at the embryonic stage, and much must be done to successfully shift to a new economic model based on technology.

6. Conclusion

The study has sought to provide a general overview of the adoption of e-payment, highlighting the main efforts made in modernizing banking and payment infrastructure as a response to requirements of digital transformation.

The finding of this research offers some insight into the digital payment situation in Algeria and its growth rate. There have been significant strides in bringing about digital transformation, especially after the agreement of interoperability -between the banking network and Algerie poste- and the covid 19 pandemic, which has underscored the necessity of digital services and impacted people's behaviour, who were conducting their dealing through digital channels to keep vital services functioning during the lockdown. Numbers of measures and actions have been taken by GIE, SATIM and banking networks to develop payment system infrastructure and digital tools, which has been reflected in an increase in electronic payment.

Even though Algeria has made a progress in investing in information and communications technology and in boosting and developing financial services, where several favourable circumstances already exist. The usage of digital and online payments is still low and hasn't reached its full potential. Most banking transactions are conducted through traditional methods, especially with a low level of bancarization which remains a significant challenge, and Algerian cultural preferences for cash, in addition to the weakness of e-commerce, with traders who are not keen to adopt e-payment because of the easy traceability of their commercial transactions, and people's preference to pay cash on delivery to the detriment of digital payment. All these shortcomings were reinforced under less developed digital infrastructure and unequal access to digital services.

Therefore, the shift to successful electronic payment services requires the affordability of secure digital identity infrastructure, and all obstacles hampering its development and its use must be addressed whether they were related to consumers' behaviour or institutional, technological factors or legal framework. Thus, the combination of banking networks, Algerie poste and government efforts are crucial to digitally transforming the banking sector.

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