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End of Studies Thesis

Masters in E-Government Management

The Elaboration of KPIs for an E-Payment System Analysis
Case: Algeria Post

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Abstract:

The integration of the electronic payment service is an initiative that requires a huge responsibility for the organizations since it involves citizens' money. As such, activities like monitoring and measuring performance play a vital role in the success of an e-payment system. Unfortunately there is a lack in literary works regarding the performance measurement of e-payment and designing the right Key Performance Indicators (KPI). To solve these problems, we have conducted a qualitative study with the main goal of showing the contributions of e-payment towards its users and providing managers with tools that would help them ensure the performance of this service.

Keywords: Electronic Payment, Key Performance Indicators, Performance Measurement, Performance.

Résumé:

L'intégration du service de paiement électronique est une initiative qui requiert une grande responsabilité pour les organisations du fait qu'elle implique l'argent des citoyens. Dès lors, des activités telles que le monitoring et la mesure de performance jouent un rôle essentiel dans la réussite d'un système de e-paiement. Malheureusement un manque d'œuvres littéraires se présente concernant la mesure de la performance du système de e-paiement et la conception des indicateurs clés de performance approprié. Pour résoudre ces problèmes, nous avons mené une étude qualitative dont le but principal est de démontrer l'apport du e-paiement envers ces utilisateurs et de fournir aux managers des outils qui les aideront à assurer la performance de ce service.

Mots Clés: Le Paiement Électronique, Indicateurs Clés de Performance, La Mesure de Performance, La Performance.

ملخص:

إدخال خدمة الدفع الإلكتروني تتطلب من المنظمات مسؤولية كبيرة لأنها تتعلق بأموال المواطنين. على هذا النحو، تلعب أنشطة كمراقبة و قياس الأداء دورا أساسيا في نجاح نظام الدفع الإلكتروني. للأسف، هناك نقص في الأعمال الأدبية المتعلقة بقياس أداء الدفع الإلكتروني و تصميم مؤشرات الأداء الرئيسية الملائمة. لحل هذه المشاكل، أجرينا دراسة نوعية تهدف الى إظهار مساهمات الدفع الإلكتروني اتجاه مستخدميه و تزويد المسيرين بأدوات تساعدهم على ضمان أداء هذه الخدمة.

الكلمات المفتاحية: الدفع الإلكتروني، مؤشرات الأداء الرئيسية، قياس الأداء، الأداء.

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LIST OF ABBREVIATIONS AND ACRONYMS:

ABM	Automated Banking Machines.
ACH	Automated Clearing House.
ACS	Access Control Server.
API	Application Programming Interface.
ARPANET	Advanced Research Project Agency Network.
ARPCE	Autorité de Régulation de la Poste et des Communications Électroniques.
ATM	Automated Teller Machines.
BBVA	Banco Bilbao Vizcaya Argentaria.
CIB	Carte Interbancaire.
CID	Card Identification number.
CMI	Centre Monétique Interbancaire.
CPI	Centre de Pré-compensation Interbancaire.
CSF	Critical Success Factor.
CTM	Centre de Traitement Monétique.
CTNI	Centre de Traitement Nationale et Internationale.
CVV	Card Verification Value.
DSL	Digital Subscriber Line.
EFQM	European Foundation for Quality Management.
EFT	Electronic Funds Transfer.
EMV	Europay Mastercard Visa.
ENIE	Entreprise Nationale des Industries Electroniques.
EPIC	Établissement Public à Caractère Industriel et Commercial.
EPS	Electronic Payment System.
GIE	Groupement d'Intérêt Économique.
HTS	High Tech Systems.
IOS	Inter-Organizational Information System.
IP	Internet Protocol.
IPM	Integrated Performance Management.

ISO International Standard Organization.

IT Information Technology.

KPI Key Performance Indicators.

M&E Monitoring and Evaluation.

MPI Message Passing Interface.

MPTTN Ministère de la Poste, des Télécommunications, des Technologies et du Numérique.

NACHA National Automated Clearing House Association.

NCR National Cash Register.

NFC Near Field Communication.

PIN Personal Identification Number.

PKI Public Key Infrastructure.

POS Point Of Sale

QR Quick Response.

RIP Relevé d'Identité Postale.

RMI Réseau Monétique Interbancaire.

SATIM Société d'Automatisation des Transactions Interbancaires et de Monétique.

SMART ER Specifique, Measurable, Assignable/Achievable/Acceptable, Realistic/Relevant, Time related, Evaluated, Reviewed.

SMS Short Message Service.

SMT Société Monétique de Tunisie.

TCP Transmission Control Protocol.

TIP Titre Interbancaire de Paiement.

TPEV Terminal de Paiement Électronique Virtuel.

UNAIDS Joint United Nations Program on HIV/AIDS.

UPW Unité Postale de la Wilaya.

INTRODUCTION

1. Background:

The world that we live in has been in constant evolution throughout the time. We used our knowledge and experience to adapt to all changes and managed to create a world more sophisticated than it used to be. In this “digital age” where technology is involved in our everyday life; organizations, businesses, and even the government are incorporating it in their strategy in order to create value and improve their quality of services, reaching performance in the process. Hence why we have been introduced to e-government where all sectors witnessed a digital transformation and services became electronic under the goal of bringing the citizen closer to the administration. Among these e-services, there is the electronic payment or e-payment service which has become the norm to use in many countries for its benefits to the consumers and its role in the economy.

The public has been embracing this concept as 67.1% of the world's population aged 15+ owns an account with a financial institution, 18.4% owns a credit card, and 29% of them pay bills and/or make purchases online. (World Bank Global Inclusion Data, 2020). Although there has been a resistance and a mistrust from Algerian citizens to use this solution, the latest global circumstances regarding the COVID-19 pandemic has encouraged them to embrace online services and avoid as much contact as possible. As a result the number of payment transactions made online saw an increase from 7 000 in 2016 to over 200 000 transactions as of August 2020 (GIE Monétique, 2020).

With this drastic increase, financial institutions need to keep working on their image in order to preserve their customers and attract more. In order to achieve that, performance needs to be one of their major concerns. Improving performance would earn them the trust of citizens/customers towards their service delivery.

Attaining a high level of performance will require organizations (financial institutions in this case) to implement a solid strategy involving all the stakeholders, giving a huge importance to the environment and the ecosystem, integrating all the different departments and making them operate on the same level having one clear and common objective. Certain guidelines and quality standards need to be applied and their activity needs to be monitored on a regular basis.

In the context of e-payment, many factors such as information security, infrastructure, technology, regulatory framework, and top management support need to be considered in order to reach performance and citizen/customer satisfaction (Mbwayo, 2017). As such, a series of appropriate indicators need to be designed and reported to help measuring and managing the performance of the organization's activity.

2. The Research Problematic:

With this in mind, we came to the conclusion that performance would be a focal point in our work. As one of the main goals for the financial institution where we did our investigation was about performance monitoring, and because of the lack of literary work in that field, we have decided to conduct our study responding to the following question:

"When can the e-payment service be deemed performant?"

Other sub-questions arise from this problematic:

- ➔ What is an electronic payment system? And who are the actors involved in it?
- ➔ What are the common payment methods?
- ➔ What is the contribution of e-payment?
- ➔ How can performance be defined?
- ➔ What is a key performance indicator? And what is its role in the organization?
- ➔ How can we select KPIs?
- ➔ Which KPI would fit in our problem studied?

3. The Research Methodology:

In order to respond to our problem, we are going to conduct a qualitative study following a constructivist paradigm. The exceptional circumstances that occured this year altered our research to a triangular method where we are going to observe the processes in the internship place, look at some relevant documentation to provide the necessary information, and interview some major actors from entities involved in the e-payment procedure. This will give us a clearer idea about our theme and would help us analyze and compare the extracted theories to the processes used in our internship place and come up with suggestions.

4. The Research Field:

Our internship takes place in Algeria Post, precisely in the postal units of Algiers West directorate (UPW). We thought that this organization would perfectly fit our research theme as it is a public financial institution which is central in the e-payment process. It is also a card issuer and besides having its own ATMs (Automated Teller Machines) and providing merchants with POSes (Point Of Sales), it offers citizens its platform (Baridinet.poste.dz) to pay bills, flight tickets and insurance, phone credits, as well as other services like consulting your account, tracking, etc. Algeria post is always making efforts to improve their quality of service especially lately since they are acquiring more consumers because of the global events, hence why our theme about performance would match their current objectives.

5. Contributions of the study:

This study will provide some much needed information in the literature about electronic payment's performance. It will help in the long term for the establishment of standards and policies that will be useful to the electronic payment service in Algeria. It also serves as a guide for those who are interested in the activity to understand the concepts related to it such as its methods, actors, benefits, and its constraints. In addition it will provide insight about the continuous improvement of this service giving people at the back-end useful processes to follow in order to manage, measure and monitor its performance and make it as complete and simple as possible for citizens. Moreover, it allows us to put in practice the acquired knowledge during our two year training.

6. The Plan:

In order to process our theme, we have structured our study into three main chapters:

- ➔ The first chapter will be divided into two parts: the literature review where we are going to start from the major works on performance management, and then tackle performance measurement. After that we are going to transition to the conceptual framework which is divided into two sections too. In the first one we are going to understand the concept of electronic payment, its history, the actors involved in it, its equipment, the methods used in the system, the service in neighboring countries and in our country, its advantages and its constraints. In the second section we are going to

understand the concept of performance, its indicators, the types of indicators, their role and the criteria to select them.

- ➔ The second chapter will concern the methodological framework where we are going to explain our research approach, the data that we are going to target, how we are going to collect and process it, as well as the introduction of our sample.
- ➔ In the final chapter we are going to describe our hosting organization and its payment system. Then we will present the results of our empirical study and discuss them giving comments and suggestions about what we think are the right KPIs that ensure the performance of e-payment systems.

CHAPTER ONE: THE THEORETICAL FRAMEWORK

1. Literature Review:

1.1. Performance Management:

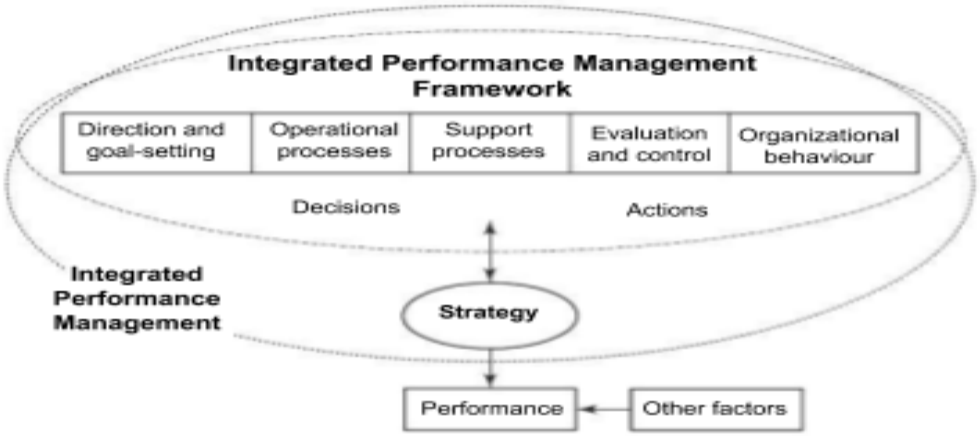
Before we discuss how performance can be monitored in the electronic payment sector, we thought we need to understand the bigger picture first and then we gradually descend into the specific parts. As such, we are going to elaborate on performance management which is the driving factor of any organization, and we will see some of the works that have been published about it.

Performance management is defined as a management process that frames the continuous improvement journey of the organization through the insurance that everyone understands the current and targeted position taking stakeholders' satisfaction into consideration. (Institute of Management Accountants and Arthur Andersen LLP, 1998). The purpose of managing performance is to achieve effectiveness and efficiency of the organization as well as creating commitment and motivation in order to get better results and achieve their goals.

The performance concept is vague and has several dimensions and perspectives. As such, multiple paradigms have been developed in order to meet the objectives of each department namely: finance (Value-Based Management), control (the Balanced Scorecard), operations (European Foundation for Quality Management EFQM Excellence Model), and risk (Integrated Risk Management). Professor in strategic management Kurt Verweire and doctor at economics Lutgart Van Den Berghe published their book *Integrated Performance Management* (2004) where they offered an approach in which all these dimensions of the organization are included under a “strategic alignment” goal. They also added the maturity alignment dimension which they considered as the missing factor that makes performance management complete for the organization.

Organizations have been victims of traditional functional silos where each department has its own framework introduced to compete for the attention of managers and to get resources. This leads to unhealthy situations where employees are unhappy and resources are wasted. That is where Integrated Performance Management (IPM) is considered useful. This following figure will give an overview to the IPM system:

Figure 01: Integrated Performance Management Positioned in a Broader Context.



Source: Integrate Performance Management: A Guide to Strategy Implementation by Kurt Verweire and Lutgart Van Den Berghe (2004).

1.1.1. Integrated Performance Management Framework and Its Contribution to The Strategic Alignment:

As we can see in the figure above, the IPM framework consists of the organization's:

- ➢ Direction and goal-setting processes;
- ➢ Operational processes;
- ➢ Support processes;
- ➢ Evaluation and control processes;
- ➢ Organizational behavior.

And in order to manage performance in an integrated way, the organization needs a well-designed and effective strategy with a clearer vision of the general goal and mission as well as the steps needed to be followed in order to achieve it. (Grant, 1995).

- ❖ **Direction and Goal-Setting:** It is the structure that is responsible for the formulation and communication of the organization's mission and vision. It also shapes the strategy and performance goals as well as allocating the resources. The direction setting activity involves charting the organization's course, mobilizing support and ensuring the alignment with the stated goals. (Garvin, 1998).

- **Operational Processes:** Also known as "the primary activity", this part concerns the creation or delivery of the product or service; generating revenue for the organization in the process. It also deals with the logistics and supply chain management, marketing and sales, and service activities. (Porter, 1985).
- **Support Processes:** It refers to the continuous improvement for the operational process which is vital for every organization aspiring to evolve, attract more consumers, and conquer major markets. Support activities include purchasing and procurement, technology development, information system, finance, accounting, legal and governmental affairs, etc. (Verweire and Van Den Berghe, 2004).
- **Evaluation and Control Processes:** This function deals with the monitoring and ensures that the organization is performing as planned. It detects malfunctions within the system and initiates corrective actions to keep the organization well-balanced. (Garvin, 1998). In order to achieve that, activities such as audit and risk management are taken into account.
- **Organizational Behavior.** The final component of the IPM framework is related to the human factor. It aims to create commitment and motivation amongst the employees and managers within the organization. It encompasses all the structural elements such as the organization's design and culture, human resource system, reward system, leadership, etc. (Verweire and Van Den Berghe, 2004).

This framework is useful to achieve a strategic alignment between the business unit managers, who are involved with the operations and support processes ensuring the realization of the strategy, allocating the necessary resources, and creating motivation and commitment within the employees; the corporate managers, who focus more on the direction-setting and monitoring processes having the major task of stimulating the business unit managers to act in accordance with the corporate goals; and the functional managers, who have the goal of verifying whether or not the expected results are achieved.

1.1.2. The Maturity Alignment Dimension:

Verweire and Van Den Berghe (2004) introduced the concept of maturity alignment as they saw that the strategic alignment alone was not sufficient to achieve performance. They

suggested that all five components of the IPM framework need to be aligned from a strategic as well as maturity perspective. They insinuate by maturity, the process side of performance management trajectory. Meaning how well each element of the IPM framework is developed in relation to the other elements. In that context, they came up with four distinct maturity levels to measure the degree of maturity of the different element:

- ➢ The pioneer environment of launching and trying or the start maturity level;
- ➢ Artisanal habits or low maturity level;
- ➢ Structured professional approach or medium maturity level;
- ➢ Competent do environment or high level maturity.

- ❖ **The Start Maturity Level:** It is the stage where the organization decides to launch a new business activity or explore new territories. In that case it deals with a high degree of uncertainty. The vision and strategy are not explicit for the direction process and thus the members don't have a clear action plan to follow. In the operational level, processes are unconnected which leads to frequent overlaps between different activities. The support process as well as the control system are based on informal and interpersonal relationships. There is no distinction between operational and supporting roles due to lack of experience. The employees feel free and creative due to the simplicity of the organizational chart. Their enthusiasm is what drives the performance of the organization.
- ❖ **The Low Maturity Level:** At that stage, the mission and vision of the organization are clearer. They know their customers and their requirements as well as their suppliers, services and products. The top management takes initiatives if problems occur. In the operational side, the activity is divided into tasks and phases. Improvement measures are rare, and the organization's way of working is based on internal experiences. The competences are defined in terms of having the necessary technical skills. The support structure is improving. When convinced about the added value of projects, supperiors can offer budgets, information technology (IT) tools, and other elements. Communication is made through several channels in order to ensure coordination amongst the different departments. Investments are put on the control and evaluation

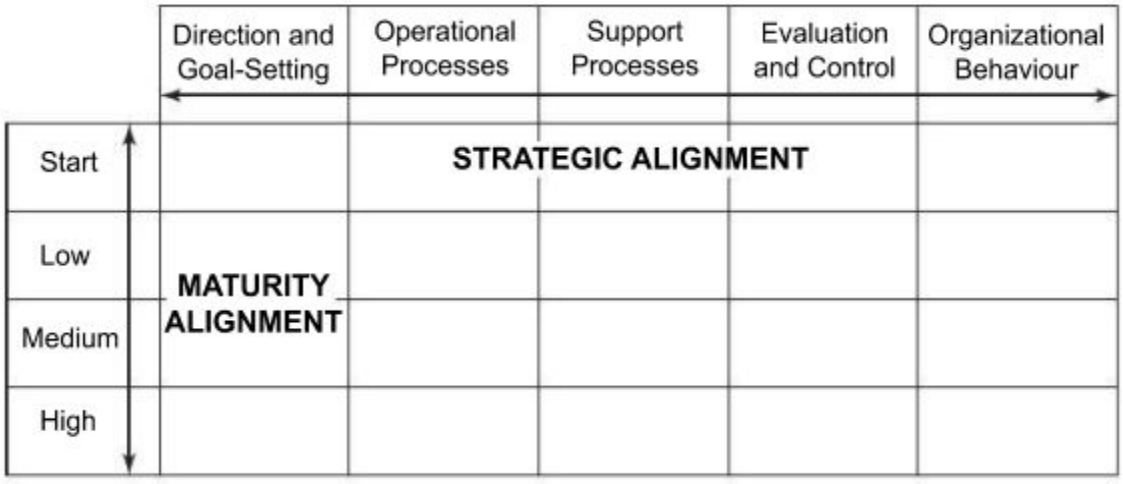
side. Diagnostics and quality checks are put in place in order to avoid deficiency. The mentality in the organization is hierarchical and sometimes paternalistic. The atmosphere is family-like and performance evaluation is determined by good workmanship. The remuneration system is traditional.

- **The Medium Maturity Level:** The organization's vision is well defined and consistent. They give a massive importance to the stakeholders where customers are included. Risks are taken into consideration and action plans are defined in a SMART (Specific, Measurable, Achievable/Acceptable, Realistic/Relevant, and Time-bound) way. Resources are made available and organizational members take part in improvement programs to reach the organization's targets. Operationally, the organization is more externally focused. Preventive actions are taken and thus there are less problems. The activities are coordinated due to the clear process flow and reengineering projects are encouraged when necessary. The support processes are formal and well developed. Communication is both internal and external. Knowledge management is central and significant amounts are spent on training and competence development. The control system manages the budget and beliefs systems. Performance measurement is important as it provides input for the targets and objectives. The organization is flexible adapting to new changes and trends. Teamwork is noticeable in that phase. Projects are managed by consulting and decision-making committees. Employees are engaged to participate in the projects and develop multidisciplinary skills. The remuneration system consists of a fixed and a variable part.
- **The High Maturity Level:** The mission and vision of the organization are known by heart and by all the employees. All categories of stakeholders are taken into consideration. The action plans are initiated by employees and taken in a SMART way. The top management only interferes to stress some "non-negotiable rules". Adjustments can be made in case of external changes or when the desired performance is not reached. The support tasks are included in the operational process. Employees are dynamic and adapt easily to changes and re-engineering processes. Frequent

consultations among team members occur daily in order to maintain efficiency and reduce wasted efforts and variability in results. When it comes to the support process, IT systems and other automation tools are used which facilitates the tasks and gain more time. Performance is highly monitored using a series of indicators applied consistently and efficiently through appropriate IT tools. Action plans are dynamically reviewed and diagnoses are given in case abnormal results occur. Problems are easily detected and solved. The control system also includes belief systems, boundary systems, diagnostic and interactive controls. The latter give attention to peer reviews as well as benchmarking so that they can manage changes effectively. The organization at this level is less hierarchical. All employees are involved in monitoring and giving suggestions to improve the performance. They work in teams through a "delegating" approach. They are result-driven and very adaptable to changes, striving for excellence. The remuneration system is based on the organization values, the results achieved, and on the attitude of the team and the individuals.

Verweire and Van Den Berghe presented a matrix to measure the maturity alignment of all the IPM framework as shown in the figure below.

Figure 02: Introducing Maturity Alignment to the Integrated Performance Management.



Source: Integrate Performance Management: A Guide to Strategy Implementation by Kurt Verweire and Lutgart Van Den Berghe (2004).

1.2. Performance Measurement:

Usually located in the monitoring part of the IPM, performance measurement also struggled to find a common definition due to its vagueness and different contexts that it can be used in. In Guy Redden's book *Questioning Performance Measurement* (2019), Neely et al. (2005) gave a simple definition that it is the process of quantifying the efficiency and effectiveness of action. Through a wide range of indicators, the managers should select appropriate ones that would cover all the goals and strategy of the organization. Also, these indicators should target internal as well as external perspectives. In his article about *Performance Indicators* (1988), Fortuin stated that the indicators have to be used in combination in order to cover all relevant aspects of an activity, product or service. These combinations need to be connected with each other and aligned with the organization's practices, structures, and priorities. At higher levels, indicators become more selective and challenging. These indicators are separated from others and considered important. They have a deeper significance for strategy and mission; hence why they are known as the Key Performance Indicators (KPIs). An organization is usually recommended to have ten to twenty KPIs amongst hundreds of other performance indicators (Parmenter, 2007). The process of measuring in Bernard Marr (2006) words, starts from identifying what needs to be measured and the appropriate data collection method to designing indicators accordingly and reporting it comprehensively.

1.2.1. Data Collection:

In his book about *Strategic Performance Management* (2006), Bernard Marr, who is an expert in that field, suggests that instead of collecting data that are found in the IT systems, we first need to identify what we want to measure and compare it with what we already have. He stresses on the fact that people need to be involved to gather as much relevant data as possible. In his words, "*Many studies have shown that perceptional assessment is as reliable, if not more reliable, than archival data*". By that he means the selection of indicators, the assessment of performance, and the data collection should involve the employees. This offers more perspectives to the information making it more complete on the one hand. And it pushes the people to be more dynamic on the other hand. They can be involved through numerical or written assessments where they can be asked to evaluate the service delivery for instance, rank

competitors, etc. There are other ways of collecting data such as surveys, in-depth interviews, observations, focus groups where they can have open discussions, the mystery shopper who can be hired by the organization with the purpose of collecting data, peer to peer assessment, etc.

1.2.2. Designing an Indicator:

Marr established a template that would ensure the development of clear and complete performance indicators.

Table 01: Template for Designing Performance Indicators.

Name	It should clarify what the indicator is about.
Strategic element being assessed	Identifying the strategic elements being assessed (e.g resources, core competencies, output deliverables, etc.)
Purpose	Describing the purpose of the indicator.
Data collection method	Describing the data collection method, the source of the data, the frequency of data collection, how it is measured, and who is in charge of this task.
● Formula and/or scale	Identifying the scale used to measure performance. (Nominal, ordinal, interval or ratio)
● Source of data	Identifying where the data comes from.
● Frequency	How often the data should be collected.
● Data entry	Identifying the person, function or external agency that is in charge of data collection and updates.
Ownership	Identifying the person in charge for the measurement of performance.
Targets and performance	Identifying the desired level of performance to attain in a

thresholds	specified time frame.
Reporting/notifications	Identifying how performance is reported and the level of accessibility for the audience as well as access restrictions, reporting frequency, format, and possible notifications and workflows.
● Audience/access	Identifying who will receive the reports (primary, secondary, and tertiary audience), the outlets, and access restrictions.
● Reporting frequency	Identifying how often indicators are reported.
● Reporting formats	Identifying how data is presented. (Numerical, narrative, tables, graphs or charts).
● Notifications/ workflows	Identifying proactive notifications and workflows.
Expiry/revision date	Identifying when an indicator is not needed anymore or need to be updated.
Cost estimate	Estimating the costs of introducing and maintaining the performance indicator. (Outsourcing costs for data collection, the efforts made for the analysis and reporting performance).
Confidence level	Evaluating how confident the indicator developer is about his work. Is the data that they possess credible. Is the indicator valid for use. It is usually interpreted using percentages, grades, colors, etc. It is also suggested to add written comments for clarification.

Source: Strategic Performance Management: Leveraging and Measuring your Intangible Value Drivers by Bernard Marr (2006).

1.2.3. Reporting Performance Indicators:

Marr considers reporting as an important part in the performance measurement activity. Misreporting an indicator would impact the decision-making and learning. It needs to be as clear and comprehensive as possible. They should include:

- ➢ The name of the indicator,
- ➢ The strategic element being assessed,
- ➢ The purpose,
- ➢ The confidence level,
- ➢ The data collection method,
- ➢ A narrative assessment of performance explaining the data and the indicator,
- ➢ Traffic light assessment (using symbols or colors to indicate the level of performance),
- ➢ Numerical presentation,
- ➢ Graphical representation,
- ➢ A comment by the owner.

He also added another element that should be taken into consideration which is the audience requirements.

2. Conceptual Framework:

2.1. Electronic Payment:

The concept of e-payment is broad and involves a lot of elements. As such, we decided to develop this section where we are going to define this concept and give a brief historical background in order to understand its evolution and the important steps that it went through. We are also going to cite the major actors involved in the protocol and give some of the common methods used in the process. Afterwards we are going to provide some insight on the payment systems of some neighboring countries picking Tunisia, United Arab Emirates, and France as samples. And in the end we are going to learn more about the payment system in our country and the entities involved in its management and it's regulations. We are also going to provide the evolution of the payment activity in the different sectors of Algeria by numbers and we will address the main constraints for its development. In the end of the section we will discuss its contribution to the social well-being of citizens.

2.1.1. Definition of Electronic Payment:

In the last decades, electronic payment has become a norm that many commercial companies adopted. Its clear and vital role for the society and economy has attracted the attention of researchers in different fields including accounting and finance, business, technology, marketing and information system to name a few (Auwal Kabir, Saidin, Ahmi, 2015). Here are some definitions that these researchers came up with:

Table 02: Definitions of Electronic Payment.

Definition:	Author:	Date
Any conventional or new payment system which enables financial transactions to be made securely from one organization or individual to another over the Internet.	Shon & Swatman	1998
One in which monetary value is transferred electronically or digitally between two entities as compensation or consideration for the receipt of goods or services. An entity refers to a bank, business, government, or even an individual consumer, the smallest 'denominator'.	Margaret Tan	2004
Payment by direct credit, electronic transfer of credit card details, or some other electronic means, as opposed to payment by cheque and cash.	Agimo	2004
Electronic payment is a form of a financial exchange that takes place between the buyer and seller facilitated by means of electronic communications.	Dennis	2004
An Electronic Payment System (EPS) is a form of Inter-Organizational Information System (IOS) for monetary exchange, linking many organizations and individual users. This	Briggs & Brooks	2011

may require complex interactions between the stakeholders, the technology and the environment.		

Source: Done by Us.

2.1.2. The History of Electronic Payment:

The first signs of electronic payment date back in the 1870s, when Western Union debuted the Electronic Fund Transfer (EFT) in 1871. Since then, people have become invested in the idea of sending money to pay for goods and services without necessarily having to be physically present at the point-of-sale. From the 1870s until the late 1960s, payments slowly went through gradual developments. Technology contributed highly to those developments. In the 1910s, the Federal Reserve of America began using the telegraph to transfer money. In the 1950s, Diner's Club International established itself as the first independent credit card company, soon followed by American Express. In 1959, the first plastic card for electronic payments was introduced to the world by American Express. Entering the 1970s, people became more reliant on computers as part of their buying process. In 1972, the Automated Clearing House (ACH) was created to batch process large volumes of transactions. NACHA established operating rules for ACH payments two years later.

With the advent of the Internet in the 1960s, Advanced Research Project Agency Network (ARPANET) was established as a military network to improve communication. Online internet banking services were offered to their customers in the 1990s. Users had to know specific encryptions and how to use data transfer protocols. The development across the Web, and the emergence of Web 2.0, led to the creation of online websites, now known as e-commerce. Acceptance and security were a big challenge for e-merchants and payment processors. In the early days of electronic payment processing, special equipment and software were required to perform payment transactions. Today, making payment transactions is as easy as tapping a button on your smartphone. Payment acceptance can be integrated into websites, mobile platforms, and at the point-of-sale for scalability amongst merchants.

2.1.3. Electronic Payment Actors:

Abdellaoui (2012), distincts four main actors that are present in any payment procedure, they are:

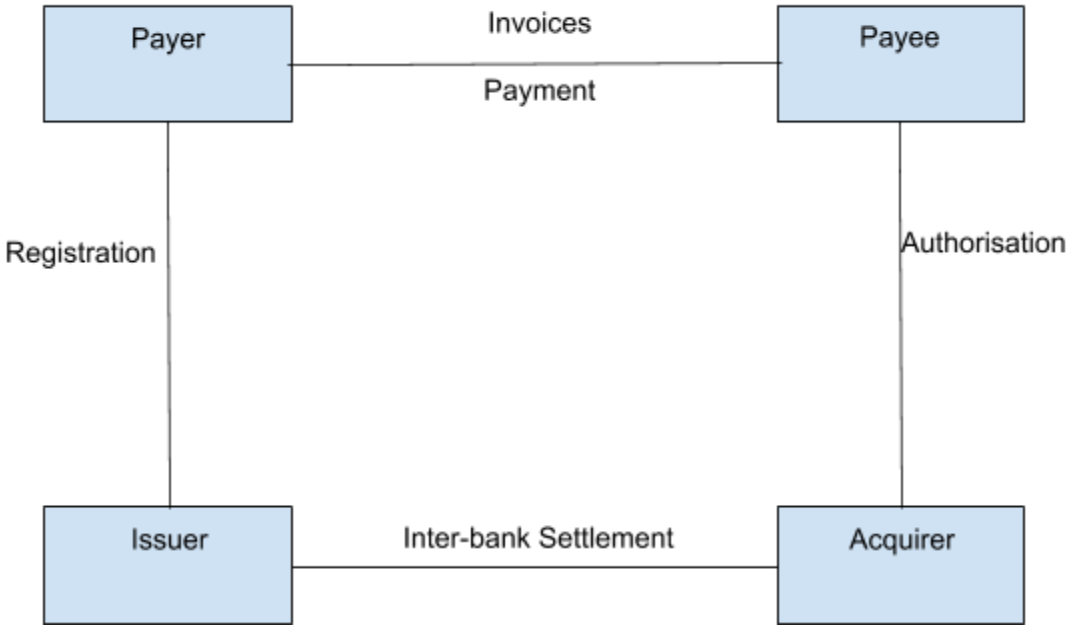
- **The Holder (The Payer):** The natural person who has the intention to buy and holds the payment means.
- **The Acceptor (The Payee):** The natural or legal person who accepts the means of payment through an acceptor system either directly or through a payment provider.
- **The Issuer:** The financial entity that issues the customer's payment method, establishing a contract and defining the rules for payment management. It is responsible for the security of the payment method and customer authentication.
- **The Acquirer:** The financial body that will acquire the data of the transaction. It establishes the acceptor's contract and defines the rules for managing payment terminals. It is responsible for the security of the payment terminals supplied to the acceptor.

Pasupathinathan (2013), adds other parties that may be involved in the payment system. These independent entities are:

- **The Trustee (The Arbiter):** This entity adjudicates any dispute between the holder and the acceptor.
- **Payment Gateways (Providers):** These entities are intermediaries that cover transaction processing between the different entities (e.g. MasterCard, Visa, etc.)
- **Certification Authorities:** It is an important entity for the e-payment systems that include Public Key Infrastructure (PKI's). The issue public key certificates to the entities involved, so that their authenticity can be publicly verified.

The following figure will illustrate the entities involved in a payment system:

Figure 03: Generic E-payment Protocol Scheme.



Source: Notes on Electronic Payment Systems http://vkrishnan.com/research/epayments.html (Consulted on April 07, 2020).

2.1.4. Electronic Payment's Main Equipment:

- **The Payment Card:**

The Payment Card is the principal tool that is used during an electronic payment operation. It is issued by financial institutions and enables its owner to access the funds in the customer's designated bank accounts or through a credit account. It allows him to make payments through POS terminals and access ATMs. It links the card holder to bank accounts and/or detailed transaction records. It is presented in a plastic rectangle form compliant to the ISO 7810 standard that all types of cards follow (85.6mm in length, 53.98 mm in width, and 0.76 mm in thickness). This norm is used in order to insure compatibility in the different networks.

In the front of a typical card, we can find:

- ➢ The logo of the financial institution presenting the issuer.
- ➢ The card number which varies from 14 to 19 digits and identifies the account of the holder with the card issuer. This number is used during the purchases and it should be kept private.
- ➢ The name of the holder.

- ➢ The smart chip makes the card secure and reduces the risk of frauds.
- ➢ The expiring date of the card.
- ➢ The logo of the network with which the issuing bank or institution is affiliated.
- ➢ The logo of the international network, in case the card can be used abroad.

In the back of the card, we have:

- ➢ The magnetic stripe that contains information about the holder and the card. This information is gathered by POSes terminals during electronic transactions.
- ➢ The hologram used for security and proves that the card is not fake. (It can be found in the front of the card).
- ➢ The contact information of the issuer.
- ➢ The signature Panel.
- ➢ The security code, usually referred to as CVV, CVV2, CID, etc. It makes the card more legitimate and protects it from hackers.
- ➢ The network logos which are additional logos that help the owner which ATMs they can use without paying fees, etc (Pritchard, 2020).

This following figure will give an overview on the components of a payment card:

Figure 04: Payment Card Component Scheme.

Front:

Back:

Source: Done by Us.

- **The Automated Teller Machine (ATM):**

An ATM is a tool that serves as an automatic counter allowing users to complete basic transactions and services using a payment card. These services include: cash deposit and withdrawals, bill payments, transfer of funds between accounts, check the balance, cheque demands, etc. when using an ATM the user will pay fees which differ depending on the brand of these ATMs and the user's card. ATMs commonly contain these following items:

- ➢ The screen that transmits information to the user about his account and balance, etc. It also guides him throughout the process of executing the transaction.
- ➢ The card reader where the card is inserted and the chip/the magnetic stripe is scanned.
- ➢ The keypad where the user enters his card number, the type of transaction he wishes to make, as well as the amount of the transaction.
- ➢ The cash dispenser is located safely at the bottom where bills are dispensed. It is linked to cassettes filled with a number of bills to be dispensed.
- ➢ The printer which gives the user a receipt of his transaction (Kagan, 2020).

Figure 05: The Automated Teller Machine Components.

Source: Done by Us.

- **The Point Of Sale Terminal (POS):**

A Point Of Sale terminal is a hardware system used at retail locations to process payment transactions. This device scans the payment cards through reading the magnetic stripe or the smart ship and detects if the holder's account has enough funds to perform his purchase. If there are no issues, it will complete the transaction, debiting the holder's account and crediting the merchant's account. A printed receipt will be given the customer. It can also notify them via email or text (Halton, 2020). This device is composed of:

- ➢ The display which shows the user information about the transaction or function currently being operating.
- ➢ The printer that prints the transaction's receipt.
- ➢ The keypad that allows the user to enter his personal information and confirm the transaction.
- ➢ The magnetic card reader where cards are swiped to access the customer's information.
- ➢ The smart card reader where cards are inserted in order to access the customer's information through the smart ship.

Figure 06: Point Of Sale Terminal Components.

Source: Done by Us.

2.1.5. Methods of Electronic Payments:

With the constant evolution of technology and the innovations that come with it, many means of payment have emerged. The commonly used by most countries are the following:

- **Payment By Cards:**

Today, financial institutions offer a variety of cards each with its own functions. The following table will explain some of the most common card types used around the world:

Table 03: Types of Payment Cards.

Cash Withdrawal Cards	These cards allow the holder to only withdraw money from ATMs or ABMs (Automated Banking Machines). The aim is to allow the cardholder to not run out of money. However there is a limited amount of money that is agreed with the issuer, and that can be withdrawn per day, even if his account has a lot of money. The use of this card is limited only to the ATM of the issuer or other banks belonging to the same network. The limit of withdrawal is different depending on the ATM used. Fees may be charged when the withdrawal is made at ATMs of other banks. International withdrawal cards benefit the holder and/or his family with the insurance and medical assistance abroad.

Debit Cards	In addition to money withdrawals, debit cards allow the holder to perform payment transactions like purchases or bill payments from distance through the internet, or at the point of sale by swiping or inserting the card in the POS. The amount of money in these transactions will be debited from the holder's account following conditions agreed with the issuer. And for risk management, the withdrawals and payments are limited. A debit card can also provide medical assistance and accident insurance when traveling abroad. These cards can be immediate (the amount during the purchase is immediately debited from the holder's account). Or it can be deferred (the cardholder can perform multiple transactions and the total amount is gathered and debited usually at the end of every month). Debit cards systematically send authorization requests for each payment transaction made. But debit cards without systematic authorization also exist specifically in France.
Credit Cards	Similar to deferred debit cards, the difference is that the debit card is limited to a checking account and the repayments are made in one go whereas the credit card is associated with a line of revolving credit from which the transactions are debited. The holder and the issuer will have a contract where they agree on certain conditions, the limit of withdrawals as well as the monthly repayments which include interests. A reporting is sent to the holder with the amount already repaid, the remaining balance to be paid and the next scheduled repayments.
Store Cards	They are used in the issuing store but they can also be used in a limited number stores called the card universe. There are many benefits and services that can accompany that kind of card such as discounts, etc. It is usually linked to a revolving credit.

Prepaid Cards	We recognize two categories: The prepaid non-bank card which permits the holder to access small services such as telephony or gift cards. And the prepaid bank card which has the same functionalities as a debit card except that they are linked to a card account instead of a bank account. The transaction authorization isn't needed since the balance check is already done on the card itself. At any time, it is easy to know how much is left on the card by accessing the account via the internet and/or SMS. When the amount is all spent, it can be reloaded.

Source: Main Types of Payment Cards and Associated Services https://www.paiementor.com/main-types-of-payment-cards-and-associated-services/ (Consulted on March 22, 2020).

- **Mobile Payments:**

It involves the use of wireless devices such as smart-phones in order to make transactions from distance through tools such as Quick Response (QR) codes and Near Field Communication (NFC). This method has proven to be effective as on one hand it offers reductions in transaction fees, and increases online security and convenience for customers; on the other hand, it is an easy way for businesses to collect valuable information regarding the behavior of their customers as well as their purchases and interests.

Mobile devices witnessed a huge growth when it comes to their users compared to other telecommunication infrastructures and as such it is an opportunity for businesses to use this method (Khan, Olanrewaju, Baba, Langoo, Assad, 2017).

2.1.6. Electronic Payment in Neighbor Countries:

In order to position Algeria in terms of e-payment progress, we thought it would be necessary to provide a comparative study by giving an overview of the payment system in other countries. In that matter we chose a fellow Arab Maghreb country in Tunisia, a Middle Eastern country in the United Arab Emirates, and a European country in France.

- **Tunisia:**

According to Wissem Oueslati, the payment phase is insured by an intermediary chosen and used by the merchant. In Tunisia this intermediary uses the bank solution or Virtual Electronic

Payment Terminal (TPEV). This solution is established through a contract between the merchant and his bank where the merchant has his account and will be credited with an amount X everytime a transaction is done on his e-merchant website.

There are currently two available intermediaries:

- ➢ SMT "Société Monétique de Tunisie" manages the processing of payments on the internet via bank cards done on the e-merchant's website. Moreover, it manages the classical transactions done via POS in markets and standard shops.
- ➢ The Tunisian Post manages the payment processing on the internet through its proposed solution "e-dinar" and the versions derived from it such as e-dinar Smart, e-dinar Universal, Dinarpost, etc.

- **United Arab Emirates:**

The Central Bank is the leader in the establishment, development, operation and oversight of payment systems in the UAE. These payment systems are:

- ➢ **UAEFTS (Funds Transfer System):** It processes high-value payments and transfers funds between banks and financial institutions via their accounts held in the Central Bank. This system enables all entities of all sizes and different nature to participate. Some of its features include debit confirmation and credit notification for every financial transfer, multi-currency support (AED, USD and EUR), well defined message formats, etc.
- ➢ **ICCS (Image Cheque Clearing System):** It insures the truncation of cheques at the point of acceptance providing a safe, secure, efficient and robust payment mechanism in the UAE. The banks will settle cheques issued on the accounts that they hold on the basis of electronic images of these cheques. This will reduce the dependence of the payment infrastructure on the papers and therefore it facilitates shorter clearing and settlement cycles. It also contributes to a quicker realization of funds on these items.
- ➢ **UAESWITCH:** It is the national ATM-sharing scheme that allows the cardholders to benefit from ATM services throughout the gulf region.

- ➢ **UAEWPS (Wages Protection System):** It provides a safe, secure, efficient and robust mechanism to streamline the timely payment of wages to employees by their employers.

- **France:**

Also known as cashless means of payment, France offers diversified means of payment that respond to multiple uses insured by credit institutions, assimilated institutions or payment institutions that have an order of payment. These divers means are:

- ➢ **The payment card:** It is the preferred mean of payment for its ease of use and the extent of its acceptance network.
- ➢ **The transfer:** It refers to the transfer of funds between two accounts mainly used by companies to pay their suppliers and the wages as well as public administrations for their social benefits.
- ➢ **The direct debit:** It allows the creditor to initiate the collection of his claims on his debtor. In doing so, it exempts the debtor from sending a payment voucher upon each settlement or maturity of recurring transactions. It is suitable for fees such as electricity charges, internet or telephone subscriptions, etc.
- ➢ **Interbank payment orders:** Referred to as Payment Interbanking Title TIP, it is very close to the direct debit in its operating mode. The TIP allows the debtor to give his agreement in each payment by affixing his signature on a paper which will be returned to his creditor.
- ➢ **The telesettlement:** This mechanism is also similar to that of direct debit. The difference is that the creditor can initiate the payment only after obtaining the debtor's ad hoc agreement via telematic means. The telesettlement is a legal obligation for the recovery of certain taxes from a certain amount of turnover.
- ➢ **The check:** It is the transfer of funds between two people through a written document without transporting cash nor using an electronic system.

Alongside these "traditional means", new means of payment has developed involving the use of internet and information technology:

- **Contactless payments:** This method doesn't require PIN codes and rather occurs by bringing a card or a mobile phone to a payment terminal. It allows more fluidity at the checkout and guarantees increased comfort of use compared to a conventional payment card.
- **The electronic wallets:** They allow making payments on the internet quickly and easily without having to enter sensitive numbers like payment card number or validity date, etc. These data are only requested during the creation of the wallet. Thereafter, the user of this solution must only enter his identifiers such as mobile phone number, email, etc. in order to pursue his transactions (Banque de France, 2017).

2.1.7. Electronic Payment in Algeria:

In this section we are going to have an overview of the payment system in Algeria. We will learn more about the major entities and organs that are involved in the procedures and the evolution of the activity ever since its official launch in 2016. After that we are going to discuss the constraints that make huge obstacles for the progress of e-payment activity.

- **The Entities Involved in the Electronic Payment System of Algeria:**
  - **The Company for Automation of Interbank Transactions and Electronic Payment (SATIM):**

The entity that links the banks into one interbank network (RMI) is known as SATIM (*Société d'Automatisation des Transactions Interbancaires et de Monétique*). Founded in 1995, it is the leading e-payment operator in Algeria. This organism aims to insure the interoperability between the actors within the financial network in Algeria. It provides banks and financial institutions with the e-payment solution and participates in the implementation of interbank rules for e-payment products management as well as supporting the banks in the implementation and development of these products contributing to the modernization of the banking sector and promoting the new means of payment. It offers clients payment cards CIB, supplies the merchants with POSes, and includes them into the network. It is also responsible for ATM and ABM management. To sum up, SATIM's main missions are: The interbankarity and international hub; integration, management and assistance for the ATM, ABM, POS, and

e-Commerce; technology watch; security and conformity to the international standards, the digitalization of the operational processes.

The interbank network that SATIM unites includes 19 members composed of Algeria Poste and eighteen banks, six of these banks are public and twelve are private.

Figure 07: The Members of the RMI.

Source: https://www.satim.dz/activite-monetique/membres-du-rmi.html (Consulted on July 03, 2020).

The services that SATIM offers vary from national ones such as: web hosting e-payment services, transaction acquisition from ATM withdrawals to e-commerce and POS payments, e-payment activity monitoring, fight against the fraud and litigation management, certification

of e-payment means, etc. It also offers international services such as: transaction routing to international networks, flow processing, issuing MasterCards, etc.

- **The Electronic Payment Economic Interest Group (GIE Monétique):**

The GIE (*Groupement d'Intérêt Économique Monétique*) is responsible for the regulations of the e-payment system in Algeria. Founded in June 2014, it reinforces the strategic approach of modernizing the banking system and offering an efficient payment system in Algeria. It defines the missions and attributions for the actors within the system and ensures the interoperability and interbankarity of the system with the local as well as international e-payment networks. It includes the nineteen members of the RMI as adhering members and the Algerian Bank as a non-adhering member that ensures the security of the payment systems and its means as well as the production and relevance of standards compliant to the regulations. The GIE monitors the e-payment system through the following functions:

- Standard management and specification in the e-payment sector.
- Definition of e-payment products and the rules of their operational implementation.
- Management of the routing technical platform.
- Security management.
- Approval.

The GIE's principle activities are:

- E-Payment interbankarity: The GIE ensures the interbankarity through the CIB network. It allows the cardholder to benefit from the e-payment services proposed by the interbanking acceptance system of an adhering member even if he is not a client. This acceptance mode is possible thanks to the standardization of the e-payment systems and products on one hand, and the engagement in ensuring interoperability between the members on the other hand. The interoperability guarantees the acceptability of e-payment products and services issued by the members and makes the transactions secure and under performant.
- Regulation: In this context, GIE manages the relationship between the adhering members, enact the rules, standards and the procedures concerning the e-payment. And it ensures the respect between the adhering members.

- Promotion: The GIE is fully committed in the promotion of e-payment devoting a number of activities to develop its products and services. In this context, it adopted a project approach that considers the following points:
    - The product/service opportunity.
    - The definition of functional specifications.
    - The definition of technical specifications.
    - The promulgation of the operating rules
    - The definition of responsibilities and the obligations for the actors involved in the exploitation of the product/service.
    - Collaborating with the interbanking network members for the production planning.
    - The follow-up and upgrade of the product/service.
- Security: The GIE plays a strategic role when it comes to the security of e-payment activity following international standards. And that is crucial in order to earn and maintain the trust of the final users be it the cardholder, or the merchant. Some of the tools that the GIE uses are:
    - The security charter which contains the rules, and security standards offered to all the members of the network. It covers the technical, functional, and regulatory aspects.
    - Mechanisms to fight against the fraud.
    - The security of payment means such as the payment cards, the POSes, ABMs, etc. This is achieved through the use of the EMV standard which ensures the security, integrity, and interoperability of transactions within the network. In addition to the use of technologies such as smart chips that ensure the security of personal information of the cardholders through a cryptographic key; security cameras in the ATM/ABM places; and not allowing the use of any e-payment material or e-commerce sites unless they are GIE approved, etc.
- Approval: In order for a company to practice an e-payment activity, it needs to get conformity through the use of a common framework. The GIE has put an approval

policy which consists of implementing rules for the e-payment actor putting them in the approval process. The main actors are the applicant, the pre-certification entity, and the accredited entity. There are three forms of approval that the GIE gives:

- Licenses delivered to card personalization centers, call centers, numerical archiving centers, and service providers.
- Certifications attributed to natural persons, interbanking equipment, solutions, and softwares.
- Authorizations for web merchants to use a platform that connects them with their bank and allows them to make payment via the internet.

❖ **The Electronic Communications and Post Regulation Authority (ARPCE):**

The ARPCE (*Autorité de Régulation de la Poste et des Communications Électroniques*) is an independent entity established under the law 2000-03 of Joumada El Oula 05 1421 corresponding to August 05 2000 to determine the rules for the post and telecommunications. It has been abrogated by the law 18-04 of Chaâbane 24 1439 corresponding to May 10 2018 to set the general rules related to the post and electronic communications. It is one of the national accredited entities in the approval process for the GIE. It gives authorization for the integration of interbank constituents.

❖ **The Interbank Operators:**

There are two main interbank operators that are involved in the e-payment activity:

➢ The Interbank E-Payment Center or (*Centre Monétique Interbancaire*) CMI is delegated by the GIE. It is heavily involved in the interbankarity and interoperability of the e-payment system, as it is responsible for its availability and its operation. Some of its tasks are: the authorisation, e-payment flow routing, the acquisition of e-payment transactions, hosting databases for merchants and cardholders, and the personalization of CIB cards.

➢ The Interbank Precompensation Center or (*Centre de Pré-compensation Interbancaire*) CPI has four main functions: management of exchange, tele compensation, and net settlement movements as well as data archiving. The main tele compensation platform

is managed by the CPI where it insures an automated and secure interbank exchange of retail payments and their compensation in a neutral and transparent way.

- **The Industries and Providers:**

They are the businesses, companies and e-commerce websites that are accredited or habilitated by the GIE in order to integrate the e-payment solution in their business. They have access to the interbank platform through their payment process and they are given certain rules to follow and respect. Some of these companies are: *Naftal, Sonelgaz, Algérie Télécom, Air Algérie*, etc.

- **The International Payment Networks:**

These entities make cross-border e-payment transactions through an international acceptor network. This aims to harmonize and standardize equipment, transaction flow exchange, as well as the implementation of an international compensation system. The payment cards that are issued by each network contain the logo of the belonging network and the companies that are within the perimeter to accept it such as Visa, Mastercard, etc.

- **The Electronic Payment Activity in Algeria:**

Algeria started officially to use the e-payment solution through the CIB card in 2016. Billing companies such as water and gas distribution, airlines, telecommunications, insurances and a couple of administrations have been the services allowed to integrate e-payment to their activity in the first phase. Today we have forty eight e-commerce websites that use the e-payment service and a global number of 1644023 transactions made since the launch of payment via the internet. The following table will break down the payment activity by sectors throughout the years:

Table 04: Electronic Payment Activity in Algeria by Numbers.

Year	2016	2017	2018	2019
Telecom	6 536	87 286	138 495	141 552
Transport	388	5 677	871	6 292
Insurance	51	2 467	6 439	8 342
Electricity/Water	391	12 414	29 722	38 806
Administrative Service	0	0	1 455	2 432
Service Provider	0	0	0	5 056
Sales of Goods	0	0	0	0
Total Number of Transactions	7 366	107 844	176 982	202 480
Amount	15 009 842,02 DZD	267 993 423,40 DZD	332 592 583,28 DZD	503 870 361,61 DZD

Source: https://giemonetique.dz/qui-sommes-nous/activite-paiement-sur-internet (Consulted on July 07,2020).

- **Constraints of Electronic Payment Development:**

Even though e-payment is one of the most used means in developed countries, and despite the advantages it offers, it is not globalized among the people in Algeria. Here are some of the main constraints that slow down the development of this e-service and prevents the algerians from adapting it:

Table 05: Electronic Payment Development's Constraints in Algeria.

Cultural constraints	● Citizens' lack of trust in the banks and other financial institutions. ● The preference of cash and classical payment means during commercial transactions over modern means of payment (checks, cards, etc).

	● Little importance given by decision makers towards electronic payment. ● Technophobia and lack of knowledge of electronic payment from the consumers.
Technical constraints	● Mediocrity of service quality provided by the issuers. Especially when it comes to operation and information execution delay. ● Rare innovations and limited banking products. ● Insufficient computerization of financial institutions. ● Lack of experience and training of employees in the domain of electronic payment. ● Absence of data transfer in real-time. ● Lack of reliability of telecommunication national network and specialized lines.
Commercial constraints	● Insufficient commercial policies from the financial institutions (communication, marketing plan, etc). ● Absence of economy of scale on transaction costs. ● Overcharging of services that the issuers offer concerning payment cards. ● Citizen's insufficient purchasing power. ● Non-reliability of revenue declarations. (Informal economy and tax diversion).
Security constraints	● Fraud and theft risks that grow alongside the development of payment. ● Overdue risks since SATIM works through delegation and doesn't consult in time clients account's balance.

Source: Done By Us.

2.1.8. The Contribution of Electronic Payment in the Social Well-Being:

In this part we are going to discuss the contributions and advantages that the e-payment service offers for the three main actors involved: the issuer or the financial institution, the cardholder or the citizen, and the acceptor or the merchant.

Table 06: The Contributions of Electronic Payment.

The financial institution	● A total automatization of settlement and compensation systems allowing them to react quickly in emergency cases such as the cancelation of an operation, blocking a card when stolen or lost, etc. ● Minimizing the operation error risks. ● Cost reduction for cash management which used to be counted, sorted, stored, registered at checkout, packaged, transported, interposed, and insured. ● The facilitation of the audit job due to the rapidity, availability, and traceability of the operations done electronically. ● It helps to better know the consumer's behavior.
The citizen	● The availability of funds 24H/24. ● Rapidity, simplicity, convenience of transactions. ● Total security thanks to the security code and the smart ship. ● It provides a certain reliability as it cannot be used when stolen, lost, or falsified because of the PIN code. ● Credit cards can offer money for emergency payments even if the bank account is empty. The debts will be paid on a later date. ● Internet payments are even easier and secure as on one hand citizens don't have to waste energy and transport costs; and on the other hand, orders can be canceled at any moment in case of non-delivery or fraud.
The merchant	● Simplicity, rapidity, and convenience of payment operations. ● Guarantee of immediate payment. ● Safety and security of cash processing (detecting counterfeit notes,

	multiple counting, theft, etc). ● Less queues and spare change problems. ● Better security since money is transported to financial institutions and not stored at the checkouts.

Source: Done By Us.

2.2. Key Performance Indicators:

This following section targets the second main concept of our theme that is the key performance indicators (KPI). It is clear that in the management field, one of the main goals is to achieve performance. Managers and leaders will have to monitor their activities and keep track on their results in order to stay updated and intervene when necessary. This is where KPIs get involved. We are going to start this section by defining the concept of performance and their indicators. We will follow that with a general typology of KPIs and then we will state their role. Finally we are going to conclude it with criteria for the selection of appropriate indicators.

2.2.1. Definition of Performance:

Throughout our research we realized that the term performance is a multidimensional concept that divided many schools. Here are some famous definitions that they provided in the literature:

Table 07: Definitions of Performance in Literature.

Definition:	Author:	Date:
Performance is the time test of any strategy.	Venkatraman & Ramanujam	1986
Performance is about deploying and managing well the components of the causal model that leads to the timely attainment of stated objectives within constraints specific to the firm and to the situation.	Lebas	1995
Efficiency and effectiveness of purposeful action.	Neely & al.	1995

Performance is a complex interrelationship between seven performance criteria: effectiveness, efficiency, quality, productivity, quality of work life, innovation, and profitability/budget-ability.	Rolstadas	1998
The level to which a goal is attained.	Dwight	1999
The term "performance" describes an evaluated contribution to the attainment of organizational goals.	Hoffmann	1999
The term "performance" describes the contribution of specific systems (organizational units of differing sizes, employees, and processes) to attain and validate the goals of a company.	Hauber	2002
Performance is understood as the ability of a company to achieve goals, i.e. meet expectations, and is therefore influenced by results in a wider sense, but also by the corresponding goal setting.	Grùning	2002
Performance is the level of attainment achieved by an individual, team, organization or process.	EFQM	2003
Performance refers to the degree of the achievement of objectives or the potentially possible accomplishment regarding the important characteristics of an organization for the relevant stakeholders. Performance is therefore principally specified through a multidimensional set of criteria. The source of the performance is the actions of players in the business processes.	Krause	2005

Source: Done By Us.

From these definitions, Tatjana Samsonwa (2012) claims that two common characteristics stand up when defining the term performance: effectiveness which is the extent to which the goal is attained, and efficiency which is the amount of resources that have been consumed in

order to achieve that goal. And from that claim, she built her conclusion saying that "*Performance is the goal achievement of an organization rather than of individuals, with the minimum resources consumed to reach the goal*". On the other hand, Otley (2001) wasn't content with the use of only effectiveness and efficiency to define such a broad term. And added a third factor which is "economy". Indeed, he argues that performance in business or public sector is the use of the three "E" that are:

- Effectiveness "*delivering desired outputs, and even outcomes*".
- Efficiency "*using as few inputs as possible to obtain these outputs*".
- Economy "*buying inputs as cheaply as possible*".

Another point of view in the field of public management, as Wouter Van Dooren, Geert Bouckaert and John Halligan (2015) argue that performance in the public sector is about intentional behavior which can be individual or organizational. They believe that performance can have a high or low quality. In other words, when performance is about the quality of actions, the term is related to capacity; when it is about the quality of achievements, then it is related to results; and if it focuses on the quality of both actions and achievements, it can be typified as sustainable results.

Finally there is the famous Gilbert's performance triangle model, introduced in 1980. This classical approach has been used by leaders in order define performance and unite the individuals under one clear direction. The following figure illustrates the essential components to achieve performance according to Gilbert.

Figure 08: Gilbert's Performance Triangle.

Source: The Importance of Measuring the Smart City Project's Performance Case The Wilaya of Algiers by Zemmali Nada (2019).

Through analyzing this scheme, we can notice that the three cornerstones of performance are: objectives, results and means.

Effectiveness is achieved when the objectives comply with the results or actions. Efficiency is attained when the results are obtained with a minimum use of the means. And relevance is reached when the means utilized are adapted to the objectives.

The realization of performance requires the accomplishment of these three segments.

2.2.2. Definition of Key Performance Indicators:

First and foremost we need to understand the meaning of an indicator. A basic definition is that an indicator is something that helps you understand where you are, which way you are going and how far you are from where you want to be. A good indicator alerts you to a problem before it gets too bad and helps you recognize what needs to be done to fix the problem. (Hart, 1999). UNAIDS Monitoring and Evaluation (M&E) (2010), has defined indicators as a qualitative or quantitative variable that provides a valid and reliable way to measure achievement, assess performance, or reflect changes related to an activity, project or a program.

In the field of business and management, indicators are known as key performance indicators (KPI) and they are highly linked to the critical success factor (CSF) of the organization. (UNAIDS, 2010). The following table states some definitions found that concerns key performance indicators:

Table 08: The Definition of Key Performance Indicators.

Definition:	Author:	Date:
KPIs are measures which help to monitor progress towards an objective or goal. They define key outcomes which need to be met if the overall objective is to be achieved. Some organizations call them measures or targets.	Leech and Corinne	2007
KPIs are more project-specific milestones or components in performance measures serving as precursors to indicate progress towards the eventual achievement of the desired performance measures.	Keith R. Molenaar and Desiderio Navarro	2011
A KPI is a measurement which evaluates how a company executes its strategic vision.	Jacques Warren	2011
Key Performance Indicators (KPIs) are among the most commonly used tools that companies employ to help manage more effectively and guide their progress. In brief, KPIs are the top level data companies use to measure performance and plan for the future.	Pacific-Crest-Group	2012
KPI is a quantification of an important business challenge.	Aleksey Savkin	2019

Source: Done By Us.

2.2.3. Types of Key Performance Indicators:

Depending on the context in which they are used, KPIs can be categorized in many different ways. Using a range of different KPI types helps give a balanced perspective to the current

situation (UNAIDS, 2010). These different types of indicators usually target various areas such as: finance, marketing, IT, human resources, customer, environment, etc (Bernard Marr, 2013).

Common types of KPIs include:

- Quantitative indicators: Presented in numbers, quantitative indicators are used to indicate quantity, percentages, etc. Therefore they can be calculated using mathematical methods. (e.g. the number of card users).
- Qualitative indicators: Focusing on "why" rather than "how", qualitative indicators portray the characteristics and status of the object by giving grades based on qualitative findings. (e.g. the satisfaction rate of the citizens).
- Leading indicators: They "lead" to successfully meet overall business objectives, and help predict the outcome of a process This is achieved by providing benchmarks that will indicate whether the activity of the organization meets the KPIs suggested and the objectives targeted, or not. They are dynamic metrics and difficult to measure.(e.g. number of new innovations).
- Lagging indicators: They measure current performance and whether it is a success or a failure. This kind of indicator is used to determine what has been attained, what was produced, and how it was received. They are easy to measure but hard to change. (e.g. total transaction failures).
- Input indicators: They refer to the resources needed and consumed for the activity. They measure quality, quantity, and timeliness of the resources. (e.g. internet speed).
- Process indicators: They measure whether the planned activities have taken place or not, and whether the process is efficient and productive. (e.g. the conduct of training courses).
- Output indicators: They are related to the product or the outcomes and results of the process activity. (e.g. revenue).
- Practical indicators: They focus on the effects of the applied processes on the company. For this reason, practical indicators differ according to the company's activity. (e.g. number of complaints)

- Directional indicators: They evaluate the position of the company in the industry and whether it is improving or declining. (e.g. time spent on the platform).
- Actionable indicators: they are related to the company's ability to adapt to changes and how effective its change management strategy is. Those changes could be within business processes, company culture, or political action. (e.g. overall change success rate).
- Financial indicators: They provide an overview to the financial health of the company. Financial metrics measure economic stability, growth, and business viability. (e.g. return on investment). (Amanda McCluney, 2017)

2.2.4. The Role of KPIs:

- **Checking position:** When measuring performance, the organization has a clear starting point from which they can define their strategies and take initiatives to attain their planned objectives. It also identifies the organization's position amongst their rivals helping them to monitor their progress and influence their decision making process. (Andy Neely, 2006).
- **Reporting and compliance:** One of the main reasons to measure performance is to communicate the findings. This can occur internally within the hierarchy, and externally with the organization's stakeholders. Be it voluntary or compulsory when it comes to legislation (taxes, accounting purposes, etc.) (Andy Neely, 2006).
- **Give credibility to information:** Measuring what is said helps reinforce arguments and provides credibility to the reported statement. According to Aleksey Savkin (2019), numbers don't lie. Indeed human intuition can lead to wrong directions whereas measured things give more detailed and precise information.
- **Tracking progress and taking strategic decisions:** KPIs help managers and leaders to set targets throughout their business in order to reach their strategic goals. (Magda Walezak, 2014) They provide useful information at each stage of the process allowing them to react instantly to any event that might impact their business. As a result, it will help them make accurate decisions on one hand, and bring speed, transparency, and a better understanding of the disclosing results. (Pierre Veyrat, 2016).

- **Controlling people's behavior:** These metrics give a clearer image on what is important ensuring the understanding and alignment of the entire team to focus on one common goal within the organization. Moreover, it motivates people to work harder and improve their weaknesses, especially when these measures are linked to a rewarding system. (Bernard Marr, 2006).

2.2.5. Criteria for Selecting Indicators:

When monitoring performance, appropriate indicators should be selected. This is an important step during the assessment of a process as it contributes to the effectiveness and efficiency of the evaluation. A KPI should be as precise as possible compliant to the aim, goal, or standard that has been reached or surpassed. The other indicators that are not linked to those can be used as background information. In that matter, the well-known SMART criteria model first introduced by George T. Doran (1981) can be used as a way to evaluate the relevance of an indicator. The acronym stands for these five criteria:

- Specifique: the indicator must target one particular area and focuses on one specific element.
- Measurable: indicators exist only when they can be measured objectively or subjectively.
- Assignable: indicators should specify who should do what.
- Realistic: they should state the results that can be achieved given the available resources.
- Time related: they specify the duration of the action and when results can be achieved.

Throughout time, the acronym evolved and expanded to SMARTER:

- Evaluated: managers should be able to evaluate the indicators and assess to which extent their goals have been achieved.
- Reviewed: managers can intervene and adjust their approach when needed in order to reach their goals.

Following a model for indicator selection will lead the organization to the right path and provide real added value.

CHAPTER TWO: THE METHODOLOGICAL FRAMEWORK

In this chapter we are going to describe the methodological approach that we have adopted to conduct our study. We are going to justify our choice of epistemological paradigm, the data that we aimed to collect, the tools to analyze it and the sample that we did our investigation in.

1. The Methodological Approach:

Because the purpose of our research problem is about the elaboration of KPIs in the electronic payment sector, our study is not going to test hypotheses or prove theories. It is going to construct knowledge through research and experience. For this reason, our research will draw its foundations from an epistemological framework of a constructivist paradigm. This paradigm is known to follow an inductive reasoning which will lead us, from the data and information that we provided in the previous chapter as well as our experience in the internship, to draw a conclusion gathering all the acquired knowledge and responding to the problem through a qualitative study.

Due to the spread of the global pandemic known as coronavirus or COVID-19, internships have been limited and thus affecting our research approach. As a consequence, we have been obliged to follow a triangular approach in the form of a combination between a qualitative observation, documentary research, and an interview.

The term “triangulation”, is used in research to refer to the inclusion of two more independent measures to collect data with the goal of legitimize the findings, provide more comprehension to the results, and give complete information (Heale and Forbes, 2013).

2. The Data to Collect:

This study is going to target data related to the electronic payment activity. We are going to accumulate some key information about the development of this service in Algeria Poste. We are also going to look deeper in the performance side of this activity and how it is monitored. This will eventually provide us with some insight about the management of that service and how its performance is measured.

3. The Data Collection Methods:

The triangular approach allows us to provide data from a variety of perspectives in order to give our research question “When can the e-payment service be deemed performant?” a valid answer. As such, the data collection methods that we have selected are:

3.1. The Observation:

According to Paul N'DA (2015), there are two types of observation: the non-participatory observation, and the participatory one. In the participatory observation, the researcher integrates the life of the studied group for a certain period. He is linked to them with the goal of understanding them internally. The non-participatory observation is when the researcher is present in the field, he notices, memorizes and notes without interrupting the process of the studied group.

The observation has accompanied us throughout our internship and our visits in the different organisms related to our study. Our observation has been non-participatory which allowed us to collect a number of information which has been reinforced during the interviews.

3.2. The Documentary Study:

The documentary study, also known as documentary research or documentary observation, is an indirect observation of previous works. This approach consists of gathering substantial documentation with the purpose of obtaining a maximum amount of useful information about the field and subject studied (N'DA, 2015).

According to Adi Bhat, in order to insure a quality of content, four main criteria should be taken into consideration:

- ➢ The authenticity of the documents;
- ➢ The credibility of the documents;
- ➢ The representativeness of the documents;
- ➢ The meaning derived from the documents.

The documentary research has the advantage of availability of data, it also saves time and money, it helps avoid bias statements, etc. On the other hand, it is known for its data potentially being limited, inaccurate, incomplete or outdated.

Our documentary collection started since the choice of this theme. We did research on the subject, looked for literary works, reviews, and other publications to better understand and master the key concepts of our topic. The sources we chose to provide credible information were mainly from books and theses from the school's library, online articles from experts, books from the online international library Scholar Vox, as well as other reports and official

websites, etc. We also tried to obtain as much documents and information as possible from our hosting organization.

3.3. The Interview:

As one type of investigation, it is an exchange during which the interlocutor gives his perceptions, interpretations and experiences while the researcher orients the conversation through his questions towards his research goals (N'DA, 2015).

Adi Bhat points out that there are three fundamental types of interviews in research:

- ➢ Structured interviews are extremely rigid research tools where questions are prepared in advance in a specific order to which the interviewee must follow. Their goal is to maintain uniformity throughout the interview session.
- ➢ Semi-structured interviews are more flexible even if the conversation is guided. The interviewer is free to add or omit questions or ask them in different orders. The goal is to make the interviewee more comfortable to speak openly in order to generate as much information as possible. The interviewer only refocuses the conversation in case it starts to go out of topic.
- ➢ Unstructured interviews lean more towards a normal conversation with the main objective in mind. The interviewer doesn't have any guidelines to follow and can approach the interviewee from any ethical manner that would guarantee genuine truthful answers.

We have decided to focus on the semi-structured interview in our data collection process. We designed an interview guide with ten questions that would provide us the necessary information to verify the data we already acquired from the observation and documentary study (see Appendix A). We interviewed some of the members of our sample face to face within a duration of thirty minutes to one hour.

4. The Data Analysis Tool:

With this chosen research approach and the data collection methods, the right tool to use to analyze this data is content analysis which, according to Wanlin (2007), is composed of three parts:

- ➢ Pre-analysis;
- ➢ Material exploration;
- ➢ Processing and interpretation.

In the pre-analysis part we are going to assemble all of our data from the observation, documentation visited and the interviews. Then we are going to explore it and adapt the information gathered to our problem processing it accordingly. The final output will be objectively analyzed and interpreted to provide answers for our study.

5. Sample Description:

Our sample is made of eight members each chosen to represent the different entities involved in the e-payment procedure (Algeria Poste, ARPCE, SATIM, GIE Monétique, MPTTN, Algeria Bank). Unfortunately, only three members answered to us.

Table 09: Members of the Sample.

Name	Place of Work	Function	Type of Response	Date of the Interview
BENSOUIAH Halim	GIE Monétique	Director of Studies and Development	Face to Face	September 13, 2020
-	MPTTN	-	No Response	-
-	ARPCE	-	No Response	-
-	Algeria Bank	-	No Response	-
-	SATIM	-	No Response	-
-	Algeria Post	-	No Response	-
SLAMANI Mustapha	Algeria Post's Center of Electronic Payment Processing	Director	Face to Face	September 16, 2020
KOUACHE Fella	Direction of Postal Units of Algiers West	Assistant Director of Electronic Payment and Financial Services	Face to Face	October 11, 2020

Source: Done by Us.

CHAPTER THREE: RESULTS AND DISCUSSION

1. Presentation of Results:

1.1. Presentation of the Hosting Organization:

Algeria Post is a public establishment with an industrial and commercial aspect under the supervision of the Ministry of Posts, Telecommunications, Technologies, and Numeric (MPTTN). It is administered by an Administration Council and headed by the minister of posts or his/her representative and led by a chairman appointed by presidential decree. This organization operates on three major levels (central, regional, and local).

- **The Central Level:** It is divided into three divisions:
  - Postal network and professions;
  - Postal financial services and electronic payments;
  - Mail/parcels.

  It also has twelve central support departments:
  - IT and network security;
  - Heritage and general means;
  - Finance and accounting department;
  - Human resources;
  - Training and development;
  - Strategy, organization, and management control;
  - Postal infrastructures and buildings;
  - Central inspection;
  - Audit and internal control;
  - Communication department;
  - Standardization and quality;
  - The stamps and philately.
- **Regional Level:**
  - Regional Inspections;
  - Regional financial centers;
  - Regional accounting centers.

- **Local Level:** Locally, there are post offices placed under the authority of postal units directorates in every wilaya. Only the capital city of Algiers has three directions: East, Central, and West where our internship took place.

1.1.1. Algeria Post Mission:

Algeria Post ensures the implementation of national policies regarding the development of postal and financial services through service management, renewal, and development of related infrastructures. It also ensures the modernization of its structures taking into account the digitalization of its different businesses and the development of a digital economy based on information and communication technology.

1.1.2. Algeria Post Vision:

Algeria Post's strategic vision revolves around:

- Becoming the leading distributor of local and home services;
- The benchmark for the citizen financial inclusion institution;
- The mail/parcels' large scale actor through the acceleration of its digital transformation and the convergence of its physical and digital networks.

1.1.3. Electronic Payment Services Development:

With the aim of densification, computerization, and modernization, Algeria Post opened her own online platform standardized and secured offering a panel of e-services that includes e-payment which has been one of the priority measures taken by public authorities.

The main goal is to popularize the diversification of electronic payment methods through the use of ATMs, POSes, internet payments, and mobile payments. Hence, within the framework of public policies aiming at the financial inclusion and the promotion of digital economy, Algeria Post has been registered as a major actor in the financial sector and is used as an instrument for the generalization of e-payment, and the dematerialization of financial transactions, and payment instruments.

Moreover, Algeria Post has made a lot of investments to improve its ATM network acquiring new generation material that offers various functions such as transfer from account to account, mobile recharge, ordering a checkbook, changing the status of the electronic payment card and changing the mobile number. This resulted in an increase from 100 thousand cardholders in

1999 to over 5.7 million (*EDAHABIA*) cardholders in 2019. And from 100 ATM distributors to 1375 modern ATMs which, by 2018, had recorded over 66 million transactions.

1.1.4. Online Services:

In addition to the online platform that was a product of the modernization measures undertaken to improve quality for the benefit of the citizen, Algeria Post digitized its services through the launch of *(BARIDINET)* platform as well as its app *(BARIDI MOB)* allowing the citizens to perform all functions that can be achieved with the *(EDAHABIA)* card such as money transactions, credit consultation, recharging phone credits, payment of gas and electricity bills, internet and telephone without having to go to post offices, payment of invoices through the merchant webs of economic and commercial operators who have joined the Algeria Post electronic payment platform, such as mobile operators, Sonelgaz, insurance companies, Air Algeria, etc.

1.1.5. The Future for Algeria Post:

Algeria Post is aiming to get even bigger and improve its quality of service through these following goals:

- ➢ Densify the postal network to promote financial and postal inclusion (increased postal presence);
- ➢ Boost and revitalize the mail distribution process in order to reduce delivery delays and the distribution of mail and parcels in anticipation of the emergence of e-Commerce, which promises to have considerable added value;
- ➢ Consolidate and secure the current production system of Algeria Post;
- ➢ Develop the portfolio of value-added services;
- ➢ Relieve some burden in postal establishments by using the new channels of online services;
- ➢ Develop electronic payment systems and promote electronic means of payment;
- ➢ Improve the performance of the organization;
- ➢ Development of electronic services as part of the Algeria Post digitization project.

1.1.6. The Electronic Payment System of Algeria Poste:

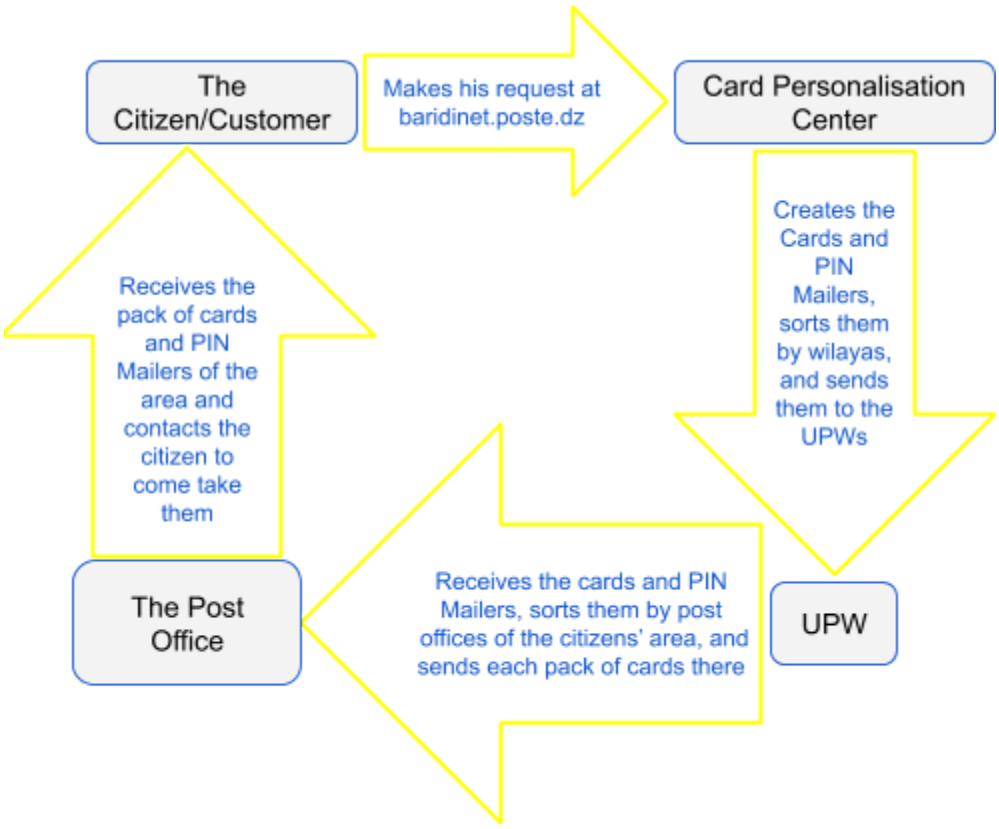
Algeria Post launched its proper electronic payment system with the goal of diversifying, modernizing and improving the quality of its financial services. This system would allow the post to expand its network and master its electronic payment activity. It is directly connected to the central information system which allows them to control the balances and process the operations made via the electronic payment channels in real time guaranteeing confidentiality and security of the data exchanged between the different actors. These channels are:

- ➢ The ATMs,
- ➢ Proximity payments through POSes and mobile payments,
- ➢ And distance payments via the internet.

- **The Payment Card:**

Algeria Post's payment card *EDAHABIA* follows the EMV standard and allows its user to perform electronic payment transactions at ATMs, POSes and online payments. It can be ordered from their online services' platform baridinet.poste.dz. When registered, the citizen's information will be sent to the CTM (*Centre de Traitement Monétique*). They will process those information and give an order to the Card Personalization Center who will make the card and insert the citizen's personal information in it. They will also create his personal code "PIN Mailer". After the creation, the cards and PIN Mailers will be sorted by wilayas and sent to UPWs. They will be entered in a distribution and routing system to ensure a secured delivery. Each UPW will then receive the cards and the PIN Mailers separately as a security measure. They will sort them up according to the post offices nearby the citizens who made the request. When the post offices receive them, an SMS will be sent to the owner notifying him about the availability of his card. He will be authentified by his ID card and his CCP account and gets his order.

Figure 09: The routing of Cards in Algeria Post.



Source: Done by Us.

- **The ATMs:**

Algeria Post's ATMs are provided by HTS (High Tech Systems) who is an intermediary between them and NCR (National Cash Register), and the former WINCOR NIXDORF, DIEBOLD NIXDORF. These providers ensure their installment and their maintenance. These ATMs offer services such as withdrawals, balance checkings, cheque demands, transfer of funds between accounts, changing the phone number, buying phone credits, getting a mini list of the last ten operations done with the card, changing the PIN and RIP codes. They are available 24h/24h and 7d/7d in different locations in the national territory (1405 ATM). ATMs are connected to the local network of the post office which communicates with the electronic payment solution (Smart Vista) where they can be monitored. Each ATM is accompanied by a receiver who ensures the well operation of the machine, the availability of consumable products and the filling of the cassettes. He is also the person in charge of the complaints regarding transaction failures. There are five cassettes in which two contain 2000.00 DA bills,

two others have 1000.00 DA and the last one is for the rejected bills in the case of a transaction failure. The user can withdraw a maximum amount of 50000.00 DA. The UPW (*Unité Postale de la Wilaya*) ATM monitoring team reaches out to the receiver when issues occur. When the problem is related to the network, it is usually solved from a distance. When the problem is technical, they contact the CTM monitoring team and they will send members from the ATM providers (HTS or DIEBOLD) to fix the breakdown.

- **Proximity Payments:**

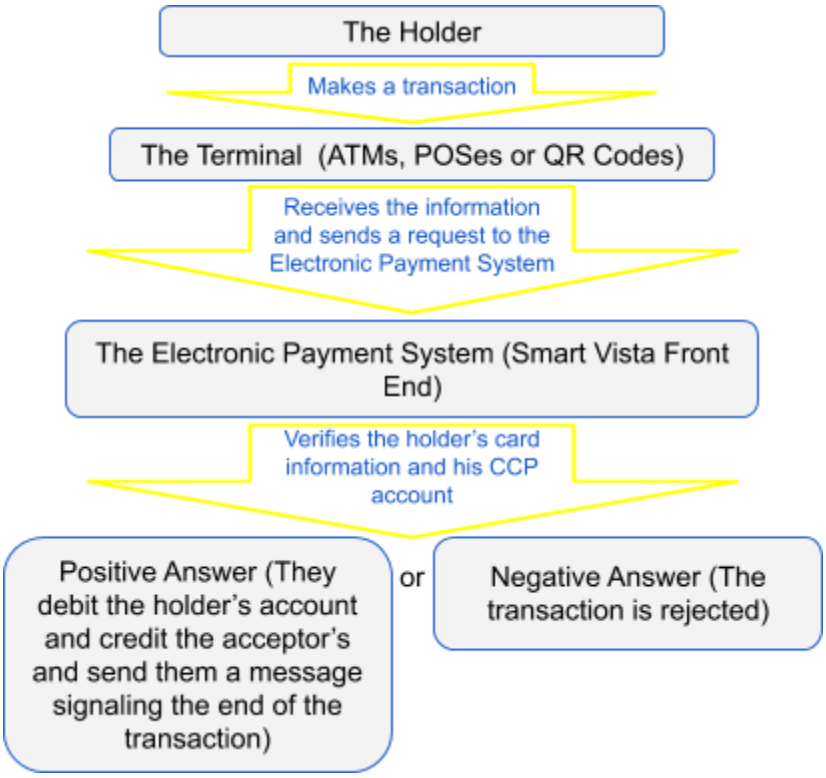
The POS terminals are provided by ENIE (*Entreprise Nationale des Industries Electroniques*). They allow citizens who own a payment card (*EDAHABIA* or *CIB*) to pay their purchases, invoices, and other services as well as the cancelation/refund of a Payment transaction. After the UPW collects the POS requests from merchants, the files will be sent to the Algeria Post structures for verifications and they will give authorization for the declaration and attribution of a POS containing the merchant's data. Afterwards the UPW will receive an order to install and set up the POS for the merchant. The latter will then come to take his POS terminal when it is set up, and will receive training to know how to use it. When declared, the POS devices are connected to the electronic payment server and the monitoring server (Terminal Management System) where they define the limit of the amount in a single transaction, they send updates, they block POSes, etc. When anomalies occur the CTM's back office is the entity that follows the situation and deals with the complaints and accountancy.

When it comes to mobile payments, Algeria Post is presenting the payment via static QR code method. These QR codes can be with a fixed amount for merchants who have a unique product to sell, or they can be without a fixed amount for merchants who have a variety of products to sell. After the request of a QR code at the UPW, the merchant will have to provide a file that will be sent to the headquarters to be verified and then to the CTM. The QR code image will then be made and declared in the electronic payment system. Then it will be sent to the UPW who will in turn send it to the merchant.

When transactions are made (at ATMs or proximity payments), the CTM's front office will monitor it through the verification of the holder's card state, his account, the data transmitted, the balance, etc. Then they will either allow the transaction to continue and signal its success

for the customer through a message on the device used and a printed receipt. Or they will deny it if they notice issues with the holder's card or account. The back office of the CTM deals with the complaints and the accountancy. SATIM interferes when transactions are made by CIB cards or the *EDAHABIA* card is used at ATMs of different banks.

Figure 10: Transactions in ATMs and Proximity Payments.



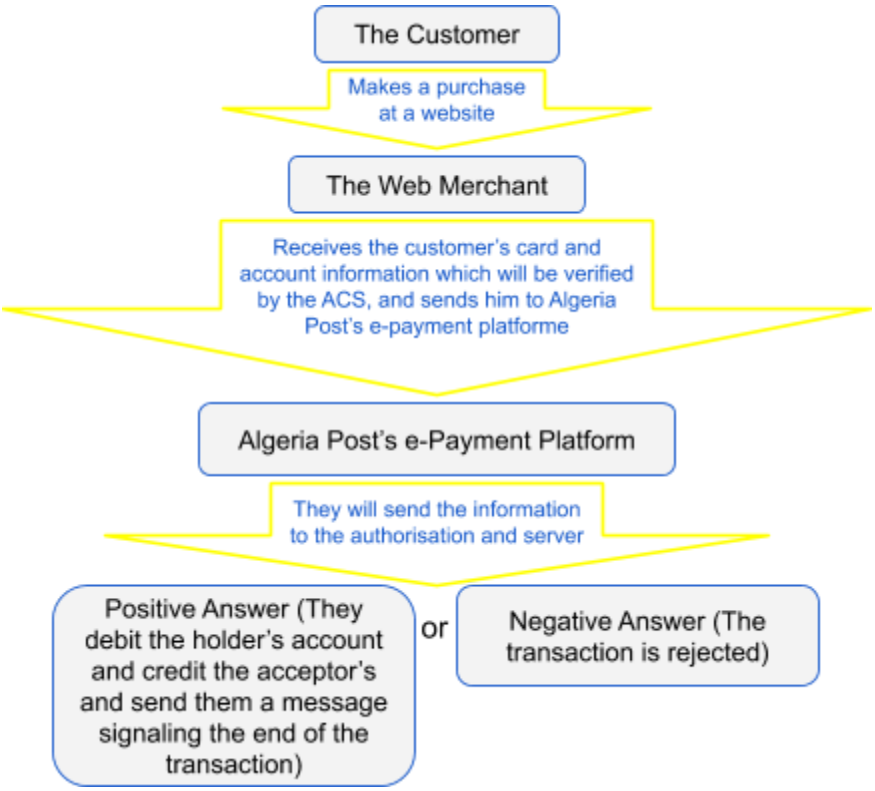
Source: Done by Us.

- **Distance Payments:**

When it comes to distance payments, numerous web merchants are adhered to Algeria Post's e-payment platform (*Air Algérie, Mobilis, Djezzy, Ooredoo, Algérie Telecom, etc*). Each web merchant desiring to integrate the payment platform to his website will have to contact Algeria Post's commercial service to understand the procedure to follow and the prerequisites to respect. When these prerequisites are met, the merchant will be given an MPI-API to be injected in his website so that the customer will be sent to Algeria Post's platform when a purchase is made. In the first phase, the merchant will have access to the testing platform where there is a limited number of persons who are given testing cards to use the solution and test different possible scenarios to see if it doesn't have dysfunctions and problems. At the

second phase, after fixing all the issues met, the merchant will have full access to the payment platform and his online activity will be available to the public. When a customer makes a purchase online and enters his card information, an enrollment check in 3D Secure is verified by the ACS (Access Control Server) to authentify the cardholder and then sends a request to the authorization server. After all the verifications the front office will allow the transaction to be done and notifies the e-payment server that it was successful, then the server will send the customer back to the merchant's website and informs them both about it signaling the end of the transaction.

Figure 11: Transactions Via Web Merchants.



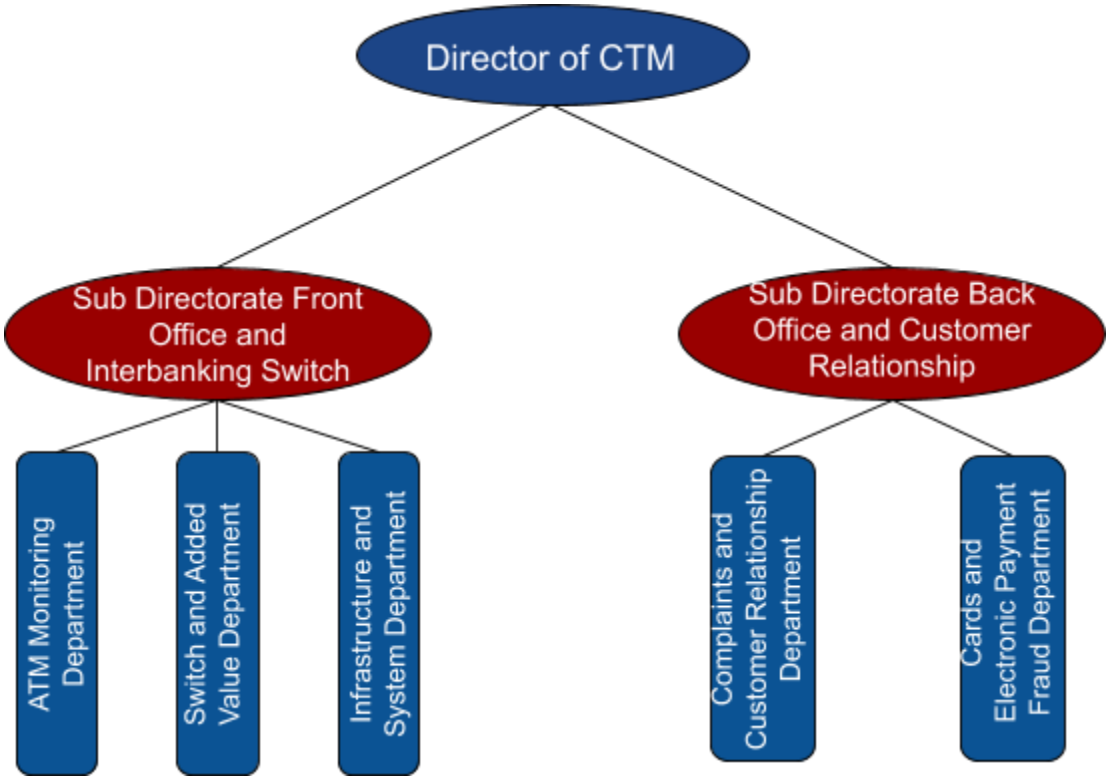
Source: Done by Us.

1.1.7. The Organizational Chart:

- **The Electronic Payment Processing Center (CTM):**

The CTM is an organism that is affiliated to the electronic payment directorate in the postal financial services and electronic payment division of Algeria Post. It is an operation and production center for the electronic payment activity. It has two sub directorates, the front office sub directorate deals with the transactions and the verifications in real time, whereas the back office sub directorate deals with the accountancy and the complaints.

Figure 12: The Electronic Payment Processing Center Organizational Chart.

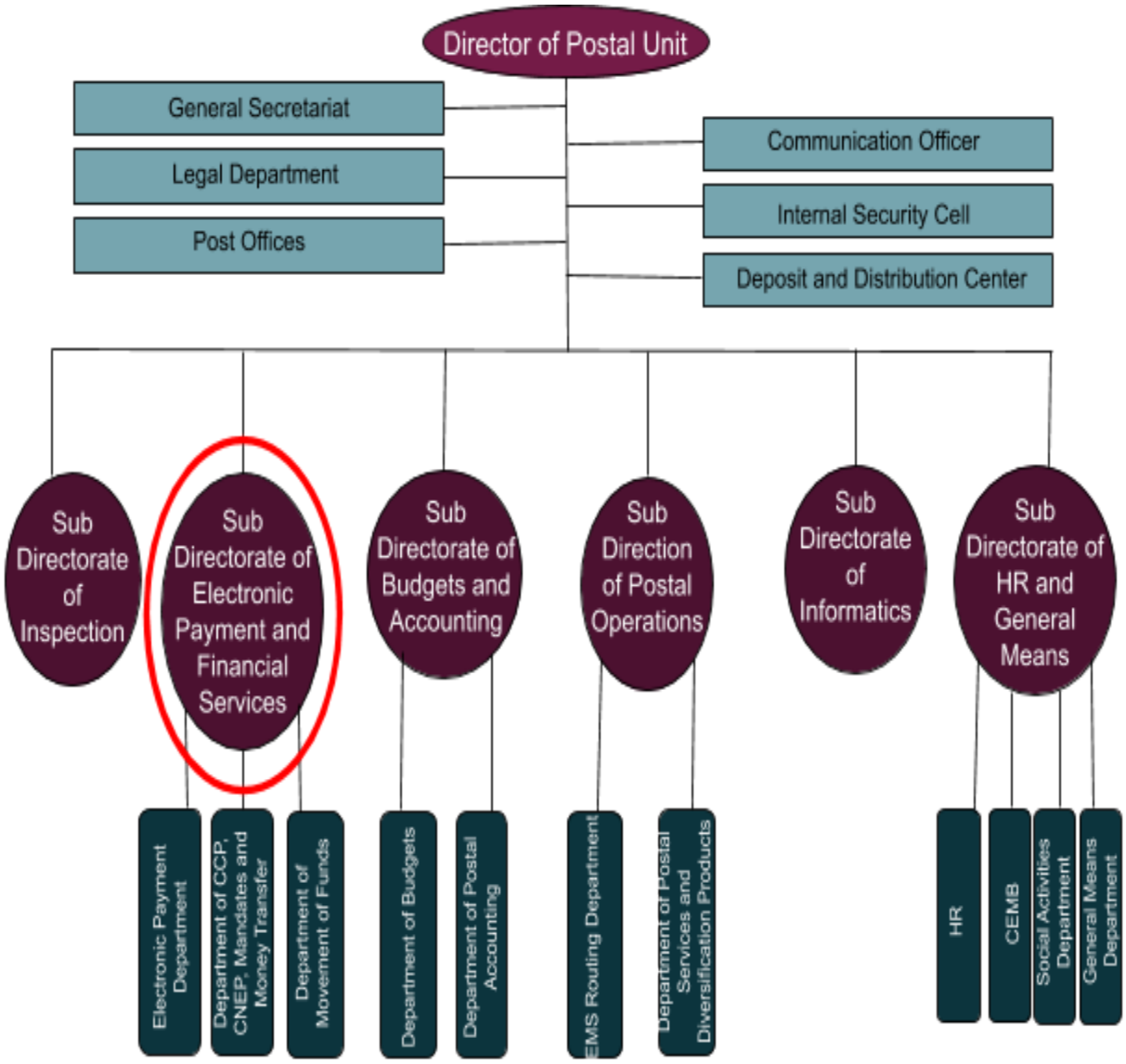


Source: Internal Document.

- **The Direction of Postal Units of Algiers West (UPW):**

The UPW Directorates are located in every wilaya of Algeria. They ensure the accountancy and financial management of the directorate, the coordination and the operation of the post offices of that region, execute action plans defined by the central division directorates, promote commercial policies around the post's products, etc.

Figure 13: The Direction of Postal Units of Algiers West Organizational Chart.



Source: Internal Document.

1.1.8. Data Sheet:

Table 10: Algeria Post Data Sheet.

Logo	
Organization Name	Algeria Post
Slogan	Always at Your Service
Legal Form	Public Establishment of Industrial and Commercial Nature (EPIC)
Creation	2003
Headquarters	Business Area Bab Ezzouar 16024 Algiers, Algeria
Directorate	Hannoufi Baya (Interim)
Activity	Mail, Parcels, Financial Services, Public Services
Services	Distribution of Mail and Parcels, Financial Transactions, Other Services (Invoice Payment and Other Partener Services).
Subsidiaries	EMS Champion Post Algeria
Headcount	28 300 (2017)
Revenue	43.4 Billion DA, 362.81 Million USD (2019)
Net Income	16.2 Billion DA, 135.43 Million USD (2019)
Website	www.poste.dz

Source: Done by Us.

1.2. Report of the Qualitative Study:

1.2.1. Internship Course:

Our internship has taken place in the UPW of Algiers West in a limited period that didn't exceed one month. During that period the director and my tutor managed to secure me a visit to the CTM in order to have a global vision of the Electronic Payment system, its functions, and how it is managed. Our stay consisted mainly of meetings with employees, assistant directors and directors where we had conversations to understand the process of electronic payment, its supervision, etc. It was an opportunity for us to collect as much data as possible. We did our observation on the workflow in these two levels (CTM, UPW). We also gathered some internal documents about their procedures and organizational charts. Finally, we conducted our interview on our sample which targeted internal as well as external actors that are involved in the electronic payment service.

1.2.2. Interview results:

- **Electronic Payment Activity Management:**

Box 01: Electronic Payment Activity Management.

How is the e-payment activity structured and managed in your department?
GIE Monétique: *"We are divided into four poles: the first one consists in the certification and approval of entities and electronic payment equipment under a mandate from Algeria's Central Bank. The second pole is about the fight against fraud. We watch, supervise, and protect all the transactions from fraud risks. The third pole concerns development and study. It deals with the establishment of rules and norms to follow. The final pole is about security, conformity and risks which determines how risks and anomalies should be handled. We also have supporting services such as statistics, information systems, resource department, complaint services, etc."* **CTM:** *"The CTM is affiliated to the electronic payment directorate in the postal financial services and electronic payment division in the headquarters of Algeria Post. We take care of the production and operation of the electronic payment activity. We declare e-payment equipment to Algeria Post's e-payment system and monitor the transactions through our front office sub directorate. We also have the back office sub directorate which mainly deals with the complaints and accountancy."* **UPW:** "*We are the interface between our customers and the Algeria Post. We provide them with electronic payment tools, we take into consideration the complaints and we report them to the CTM's back office. We also monitor the ATMs.*"

Source: Done by Us.

- **The Dysfunctions Encountered in the e-Payment Activity:**

Box 02: The Dysfunctions Encountered in the e-Payment Activity.

What kind of dysfunctions have you encountered in the e-payment process? And how are they solved?
CTM: *"Dysfunctions can be related to network issues where transactions may not be fully completed and the client is debited but doesn't receive the service he paid for. Also in the ATM levels where the citizen performs a withdrawal transaction but paper money is blocked and as a result he gets debited but he doesn't receive his money. So he will file for a complaint in order to get them."* **UPW:** "*Some of the problems that we encounter are related to the lack of communication between departments, between the head of institutions and citizens, etc. We also may encounter network problems. The complaints have reduced recently and most of those that we receive are related to the interbankarity because of the different structures and their management approach.*"

Source: Done by Us.

- **E-Payment Performance Management:**

Box 03: E-Payment Performance Management.

How do you manage the performance of an e-payment system?
GIE Monétique: "*We consult the statistics of our adhering members. We present the performance indicators and we weigh in their work such as POS acquisitions and sales for merchants, ATM developments, etc."* **UPW:** "*At the UPW we only report and the CTM deals with the product's performance. We also ensure the well-functioning of the ATMs.*"

Source: Done by Us.

- **E-Payment Performance Measurement:**

Box 04: E-Payment Performance Measurement.

How do you measure the performance of an e-payment system?
CTM: *"For me performance is measured by the number of accepted transactions of the total number of transactions that happened but that is not all, if we take those who had their transaction fail and see the reason why they got rejected, we will find that many people who made mistakes in the card number for example, others may have their phone number not associated to their card, another case maybe when they don't have enough money on their account to pay their purchases, etc. This proves that we need to analyze those who got their*

transactions rejected in order to decide if the e-payment system is performant or not." **UPW:** "*Before the monitoring activity got moved to the CTM, we used to measure the performance of ATMs through the number of their breakdowns and the number of their fixations. Nowadays we only focus on the accounting of ATMs and how many operations occurred, the volumes, etc.*"

Source: Done by Us.

- **E-Payment Key Performance Indicators:**

Box 05: E-Payment Performance Measurement.

According to you, what are the most important indicators for the performance of an e-payment system?
GIE Monétique: "*Number of client/cardholder, number of POSs, number of ATMs, number of transactions (withdrawals, proximity payments, and distance payments), number of agencies, number of complaints (solved, unsolved), number of fraud cases, transaction volumes.***"** **CTM:** "*The ratio of justified transaction failures and the ratio of unjustified transaction failures.*" **UPW:** "*The number of breakdowns for me is one of the most important indicators to take into consideration.*"

Source: Done by Us.

- **Contributions of e-Payment to the Actors Involved:**

Box 06: Contributions of e-Payment to the Actors Involved.

In your opinion, what are the contributions of e-payment for the different actors involved?
GIE Monétique: "*The main contribution of electronic payment is cash reduction since it is difficult to quantify. This would save companies time and money. It also ensures security of transactions.*" **CTM:** *"For the customers/citizens they will gain more time, security of funds and transactions. Currently this activity has become an absolute necessity due to the current conjecture, we are trying to reduce the manipulation of cash which may be a major source of contamination. In addition it offers a traceability for the transactions. For merchants, they will have less cash meaning less deposit and less logistic costs concerning the store takings and their loading in their bank accounts. And for financial institutions, this activity represents a growth driver, the more possibilities we offer to our citizens to make online transactions of all types is a jump for us to the digital economy, but there must be a mastery of all aspects like security, marketing, customer service, etc."* **UPW:** "*First of all, it is a modernization move for financial institutions, and a source that*

will generate income through the taxes and fees that merchants and citizens pay when making transactions. It benefits merchants from gaining time and ease of use. It also offers security for the citizens who won't have to bring cash with them wherever they go."

Source: Done by Us.

❖ **Future e-Payment Projects and Their Challenges:**

Box 07: Future e-Payment Projects and Their Challenges.

Are there future projects to generalize and improve the e-payment activity? What are the challenges met during the modernization of the payment project?
GIE Monétique: "*We currently have two big projects, the first concerns the payment by card and its evolution to become contactless where card users won't need to put their cards in a device to perform their transactions. The second big project concerns mobile payment. In this case the phone becomes a payment means where the card has been digitised and implemented in the phone. We also take into consideration the people who don't have advanced smartphones, we can propose to them a new way of paying their purchases through a mobile account using an USSD code...The principle challenges are mainly linked to security and avoid fraud cases which is the concern of all banks. There is also the challenge of making digital purchase vouchers credible proofs, especially legally.*" **CTM:** *"We are currently launching the mobile payment project or payment by QR code. This project consists of giving the merchant a QR code to put in his merchandise then the client will open the app (BARIDI MOB) and chose (BARIDI PAY) section where he will scan that QR code to get all the information of that merchant and then he can put the amount he has to pay and validate it. He will receive an SMS on his phone to confirm that he made the transaction and then he will be debited and the merchant will be credited...The number one challenge is related to the Algerian culture, the e-payment service needs the e-citizen which is the main component. The citizen needs to be educated, encouraged, and accompanied. Unfortunately our banks have a lack in their customer reception and how they offer their services. As soon as they try to make improvements, they receive more costs forcing them to stay where they are. Citizens are also subjects of compromises as they are only concerned about their stability and they wouldn't make changes otherwise, and this happens in all different structures in my opinion. We are also currently facing the challenge of affiliating over two million Algerian merchants to the electronic payment system before the end of the year because of the organic law. Meaning we need to acquire over two million POSs to give to these merchants. They need to be sensitized as there is an eventual resist to change."* **UPW:** "*Our current project is to equip all merchants with POS terminals.*"

Source: Done by Us.

❖ **Advice for e-Payment Managers:**

Box 08: Advice for e-Payment Managers.

What advice would you give for the managers of e-payment solutions?
GIE Monétique: "*I would advise them to bring the users closer and not push them away. They need to have a good infrastructure and staff training where clients can be well received and given simplified explanations.*" **UPW:** *"The electronic payment system has to be operational and well developed. I would also stress on the infrastructure side, there must be a good communication between head of institutions and citizens as well as communication between departments.*"

Source: Done by Us.

2. Discussion of the Results:

2.1. The Elaboration of KPIs for Algeria Post's e-Payment System:

As previously mentioned, an organization is usually recommended to have ten to twenty KPIs amongst hundreds of other performance indicators (Parmenter, 2007). From our experience during our stay in the internship and based on the data collected from the interview and our previous research, we have decided to establish ten essential indicators that would ensure managers to hold accountability between the operation of the electronic payment system and Algeria Post's goals (see Appendix B for the detailed KPI design). These KPIs are:

Table 11: Algeria Post's Suitable Electronic Payment System KPIs.

Indicator	SPECIFC	MEASURABLE	ASSIGNABLE	REALISTIC	TIME RELATED	EVALUATED	REVIEWED
Number of *EDAHABIA* Cardholders	✔	✔	✔	✔	✔	✔	✔
Number of Automated Teller Machines	✔	✔	✔	✔	✔	✔	✔
Number of Point Of Sale Terminals	✔	✔	✔	✔	✔	✔	✔
Number of Web Merchants	✔	✔	✔	✔	✔	✔	✔
Number of ATM Transactions	✔	✔	✔	✔	✔	✔	✔
Number of POS Transactions	✔	✔	✔	✔	✔	✔	✔
Number of Distance Payment Transactions	✔	✔	✔	✔	✔	✔	✔
Number of Complaints	✔	✔	✔	✔	✔	✔	✔
Number of Fraud Cases	✔	✔	✔	✔	✔	✔	✔
Number of Adhering Members to *BARIDI MOB* App	✔	✔	✔	✔	✔	✔	✔

Source: Done by Us.

★ **The Number of *EDAHABIA* Cardholders:** Without a payment card, there wouldn't be any electronic payment transaction in the first place. Hence why the more *EDAHABIA* cardholders Algeria Post acquires, the more chances of e-payment transactions will occur. This indicator is compliant to the SMARTER criteria model as it exclusively targets the holders of *EDAHABIA* cards, they are going to be measured through the number of requests and the cards already made by the people in charge of

collecting the requests. Supporting indicators can follow this KPI such as the frequency of use of *EDAHABIA* cards, the citizen satisfaction rate, etc.

★ **The Number of Automated Teller Machines:** Just like the importance of cardholders, it is essential to offer electronic payment channels to be as reachable as possible. The ATM is a channel that offers a lot of useful services for the Algerian citizen and they are available 24H/24H and 7D/7D. It focuses on the ATMs' availability, and the monitoring team can measure it through their server and give concrete results whenever the data is needed. The number of operational ATMs, breakdowns as well as other indicators can support this KPI.

★ **The Number of Point Of Sale Terminals:** The POS terminals are the most common used channels for e-payment transactions. The number of POS terminals focuses specifically on these devices, measured through the number of POS declared at the CTM. Supporting indicators can be in the form of the number of operational POSes, the number of breakdowns, etc.

★ **The Number of Web Merchants:** This KPI focuses on the e-commerce platforms which are slowly getting more utilized. Having merchants using Algeria Post's e-payment platform will indicate how performant their solution is. It targets a specific item and measures it through the data provided by those who offer these web merchants access to Algeria Post e-payment platform. The results behind this KPI help indicate the positioning of the organization in terms of distance payment channels.

★ **The Number of ATM Transactions:** This indicator will point out how many people rely on ATMs' services instead of going to physical counters. It targets a distinct element which is transactions that Algeria Post's ATMs' services offer. It can be measured by the ATM monitoring team through their server. The supporting indicators can be the ratio of successful transactions and failed ones, and also the ratio of failed transactions that are justified and unjustified, etc.

★ **The Number of POS Transactions:** Similar to the previous indicator, it shows how many people rely on using scriptural payment means instead of using physical cash. It focuses on the amount of use of POS terminals to pay for goods and services. It is

measurable through the monitoring teams and it provides answers in time to help the organization to make decisions to pursue their plans or adjust them. The supporting indicators can be the ratios of successful and failed transactions as well as the justified and unjustified rejects, the transaction volumes, etc.

- ★ **The Number of Distance Payment Transactions:** This indicator indicates how many citizens accepted the e-services and use them in their daily lives. It will also prove how reliable and secure Algeria Post's e-payment server is. It fully deals with the performance of Algeria Post's e-payment server. The people who are in charge of this server can measure it and give results when needed. Many supporting indicators can follow this such as the amount of time spent on the server, the transaction volumes, the number of cut cases and the time spent to fix them, the ratios of successful and failed transactions, etc.
- ★ **The Number of Complaints:** This indicator is important for Algeria Post as it reveals whether or not the payment system functions with anomalies. It also contributes in the continuous improvement of the service as it will help identify the problems and improve them. This indicator targets particularly the issues involving Algeria Post's e-payment products. It can be measured by the CTM's back office who deals with the complaints. The data is accessible at any time and provides results that play a role in the strategy of Algeria Post. Supporting indicators that can accompany this are the number of solved and unsolved complaints, the time spent to solve the complaints, etc.
- ★ **The Number of Fraud Cases:** This indicator plays a major role as one of the main goals behind the electronic payment service is to eliminate fraud. The number of fraud cases will help them improve their security systems and ensure the best product possible. It can be measured by the team that oversees the fraud server at the CTM's back office.
- ★ **The Number of Adhering Members to the *BARIDI MOB* Application:** This final indicator allows Algeria Post to follow its members. It indicates how many citizens use the platform and rely on its e-services. It is measurable by the team who manages the

app. This indicator is supported by the amount of time spent on the platform, the number of transactions achieved from the app, transaction volumes, etc.

2.2. General Synthesis:

Based on the qualitative study that we have conducted, we can summarize the results in the following points:

- ➔ Algeria Post cares about improving their quality of services and modernizing its sector which has been shown through the reduction of complaints in the past year.
- ➔ The current circumstances have driven them even further to innovate and diversify their electronic payment system.
- ➔ Citizens are slowly adapting to the electronic service culture and moving to the information society.
- ➔ Most of Algeria Post's problems concerning their electronic payment system are related to network, communication and interbankarity sometimes.
- ➔ The performance management of the service is done through their electronic payment solution where each team monitors the activities from different areas (ATMs, POSes, mobile payments, and internet payments). The accounting is done every end of the day, and there are monthly reports about statistics and metrics to measure the performance of the system.
- ➔ The most accurate indicators that we have managed to come up with are:
  - ◆ The Number of *EDAHABIA* Cardholders;
    - The Number of *EDAHABIA* requests;
    - The Citizen Satisfaction Rate;
    - The Frequency of Use of *EDAHABIA* Cards.
  - ◆ The Number of Automated Teller Machines;
    - The Number of Operational ATMs;
    - The Number of Breakdowns;
    - The Amount of Time Spent to Fix The Breakdowns.
  - ◆ The Number of Point Of Sale Terminals;
    - The Number of POS Requests;

- The Number of Operational POSes;
- The Number of Breakdowns;
- The Amount of Time Spent to Fix The Breakdowns.

◆ The Number of Web Merchants.

◆ The Number of ATM Transactions;

- The Ratio of Successful Transactions;
- The Ratio of Failed Transactions;
- The Ratio of Justified Transaction Failures;
- The Ratio of Unjustified Transactions Failures;
- Transaction Volumes.

◆ The Number of POS Transactions;

- The Ratio of Successful Transactions;
- The Ratio of Failed Transactions;
- The Ratio of Justified Transaction Failures;
- The Ratio of Unjustified Transaction Failures;
- Transaction Volumes.

◆ The Number of Distance Payment Transactions;

- The Amount of Time Spent on the Websites;
- The Number of Cut Cases;
- The Amount of Time Spent to Fix Those Cuts;
- The Ratio of Successful Transactions;
- The Ratio of Failed Transactions;
- The Ratio of Justified Transaction Failures;
- The Ratio of Unjustified Transaction Failures;
- Transaction Volumes.

◆ The Number of Complaints;

- The Ratio of Solved Complaints;
- The Ratio of Unsolved Complaints;
- The Amount of Time Spent to Solve the Complaints.

- ◆ The Number of Fraud Cases.
- ◆ The Number of Adhering Members to the *BARIDI MOB* Application;
  - The Amount of Time Spent on the Platform;
  - The Number of Transactions Done Through the App.
  - Transaction Volumes.

➔ The indicators above play a crucial role in the decision making process of Algeria Post and can determine if their electronic payment service is performant or not.

➔ When designing KPIs, they should target a specific matter and surround it from as many angles as possible involving the right people to do it. They should also be well elaborated and reported in time under metric forms.

2.3. Recommendations:

From the research obtained, the interviews conducted, the observations made and the experience acquired; we have been able to witness processes up close and managed to elaborate the important KPIs that ensure the performance of Algeria Post's electronic payment system. In that matter, we can give the following recommendations:

➔ Awareness campaigns and training should be more obtainable for the public in order to have a better idea about the electronic payment service and how to use its tools.

➔ The infrastructure and staff should be improved and well informed about the products in order to provide guidance for citizens.

➔ Communication is crucial between the different entities of Algeria Post about every new information occurring. (The information system has to be updated and operational to transmit all the information flow throughout the different levels of the organization.)

➔ The network should be improved in order to avoid dysfunctions and breakdowns.

➔ The legislative framework needs to give more attention and provide detailed legal texts that would explain the rights and duties of each actor in the e-payment procedure, as well as ensuring their security and reducing fraud.

➔ The interbankarity between Algeria Post and other banks needs to be advanced through a strategic alignment of the different structures and their working procedures.

- ➔ The designed KPIs should be regrouped in a dashboard and reported in the right deadlines giving all the necessary information.
- ➔ Algeria Post needs to keep innovating and improving its electronic payment service following different international benchmarks in order to achieve a numerical economy that would bring them value, place them as industry leaders, and most importantly bring the citizens closer to them.

CONCLUSION

As a reminder, our desired goal behind this thesis was to use our acquired knowledge throughout our two year training in the field to establish a guide for managers that can help them distinguish whether an electronic payment system is performant or not by identifying a series of relevant Key Performance Indicators. We conducted our study in the public financial institution Algeria Post where they offer their e-payment solution (*BARIDINET*) and (*BARIDI MOB*) alongside their card (*EDAHABIA*) to install a digital culture for the public and reduce the manipulation of cash ensuring secure transactions and less fraud cases.

We arrived at the conclusion that performance is a concern for Algeria Post that is incorporated in their goals. And it is shown through the reduction of complaints from citizens. The most important indicators that we thought can deem the electronic payment service of Algeria Post performant are the number of their cardholders, their ATMs, POSes, and web merchants that use their e-payment server, transactions made using ATMs, proximity and distance payments, complaints, fraud cases, and finally the adhering members to their app.

The results of this work allow us to provide more theoretical information concerning the implantation, management, monitoring, and improving the electronic payment service from a financial institution standpoint. It also provides Algeria Post clearer checkpoints to attain and achieve their goals. The most important priorities for them are to improve their infrastructure, their network, and their interbankarity process.

We will note that this research has been subject to limitations that influenced our elaboration of this thesis. The most noticeable one is the spread of the global pandemic COVID-19 which led to the suspension of internships and only reopening six months later giving us only a one month period to do our empirical study and preventing us from deepening our knowledge about concepts as much as we wished. The second constraint is the fact that we have been sent to do the internship at the UPW of Algiers West instead of going to the headquarters where we could have followed the performance measuring process closer. We encountered a lack of documents that are related to the KPIs of e-payment from an issuer perspective. The documentation has also been limited in the internship due to the confidentiality of certain information. The Algerian environment in which we are doing our research is not used to the cooperation of researchers/trainees in the management field which influences the interactions

and the content of the interview answers as well as the reachability for certain people in our sample.

Our work dealt exclusively with the electronic payment management in the postal sector leaving a number of other sectors to study about. Therefore, more in-depth and larger work needs to be pursued in order to reach more concrete results. The problem targeted needs to continue to be studied.

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APPENDIX A - INTERVIEW GUIDE

Interview Guide

As part of our end of studies project which is about "The Elaboration of KPIs for an E-Payment System Analysis" in your institution. We have designed this interview to collect data for an empirical study in our thesis. We would like to ask you some questions to provide more evidence in our research:

1/ Could you introduce yourself? What is your pedagogical and professional experience? Are you involved directly or indirectly in the e-payment process?

2/ How is the e-payment activity structured and managed in your department?

3/ What kind of dysfunctions have you encountered in the e-payment process? And how are they solved?

4/ How do you manage the performance of an e-payment system?

5/ How do you measure the performance of an e-payment system?

6/ According to you, what are the most important indicators for the performance of an e-payment system?

7/ In your opinion, what are the contributions of e-payment for the different actors involved?

8/ What are the challenges met during the modernization of the payment project?

9/ Are there future projects to generalize and improve the e-payment activity?

10/ What advice would you give for the managers of e-payment solutions?

Thank you for your collaboration.

APPENDIX B - KPI DESIGN

❖ **KPI 01:**

Name	The Number of *EDAHABIA* Cardholders.
Strategic element being assessed	This Indicator assesses how many people possess *EDAHABIA* cards and rely on its services.
Purpose	The main purpose behind this indicator is to provide analysis about how many people rely on the electronic payment services, how much trust they give to Algeria Post's *EDAHABIA* card, and how effective its use is. It is needed to help monitor the progress and delivery of Algeria Post's strategy which is promoting the scriptural payment means.
Data collection method	
● Formula and/or scale	The data will be measured in a nominal form by the numbers provided about the delivered cards.
● Source of data	It is available through the reports made about the cards that have been received by their owners.
● Frequency	It is continuously measured and daily reported.
● Data entry	The post offices are the entities in charge of delivering the cards to their owners and thus they are the ones who will provide the numbers and report them to the UPWs.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-
Reporting/notifications	

• Audience/access	The primary audience is the electronic payment division and postal financial services directorate who is the main actor that makes decisions concerning the payment card's strategy. The secondary audience will be the affiliated entities such as the Card Personalization Center, the CTM and the UPWs. The tertiary audience will be other stakeholders such as the GIE and the public who can access the information from Algeria Post's website.
• Reporting frequency	The indicator should be reported monthly.
• Reporting formats	The report should be in a numerical form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The post offices will daily send the UPW's sub directorate of electronic payment and postal financial services a written report about the delivered cards, the UPW will send it to the electronic payment division through a fax or email and the division will in turn process the data and report it to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all the delivered cards are recorded. The information is 100% credible.

❖ **KPI 02:**

Name	The Number of Automated Teller Machines.
Strategic element being assessed	The element assessed here is the ATMs that are affiliated to Algeria Post.
Purpose	The purpose of this indicator is to provide insight about the availability and accessibility of ATM services by the citizens. It is needed to establish the positioning of Algeria Post in terms of electronic payment services offers.
Data collection method	
● Formula and/or scale	The provided data is going to be numerical as it will be related to the number of installed ATMs.
● Source of data	The data is going to be collected form Algeria Post's Smart Vista solution where ATMs are declared and monitored.
● Frequency	The collection should be continuous.
● Data entry	It is provided by the ATM monitoring team in the CTM.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-
Reporting/notifications	
● Audience/access	The primary audience is the electronic payment division and postal financial services directorate who is the main actor that makes decisions concerning the ATM strategy. The secondary

	audience will be the affiliated entities such as the CTM and the UPWs. The tertiary audience will be stakeholders such as the GIE and the public who can access the information from Algeria Post's website.
• Reporting frequency	The indicator is reported yearly.
• Reporting formats	The report should be in a numerical form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The ATM monitoring team will send reports to the electronic payment division and postal financial services directorate about the ATMs installed and declared, the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all the installed ATMs are declared in the server. The information is 100% credible.

❖ **KPI 03:**

Name	The Number of Point Of Sale Terminals.
Strategic element being assessed	The assessed element here is the number of commercial POSes that Algeria Post deliver to merchants.
Purpose	The purpose of this indicator is to provide information about the merchants who are equipped with POSes and offer to citizens the chance to pay for their goods and services electronically. It is needed to establish the positioning of Algeria Post in terms of electronic payment services offers.
Data collection method	
● Formula and/or scale	The provided data is going to be numerical as it will be related to the number of delivered POSes.
● Source of data	The data is going to be collected from Algeria Post's Smart Vista solution and the Terminal Management System where POSes are declared and monitored.
● Frequency	The collection should be continuous.
● Data entry	It is provided by the monitoring team in the CTM.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-
Reporting/notifications	
● Audience/access	The primary audience is the electronic payment division and

	postal financial services directorate who is the main actor that makes decisions concerning the POS strategy. The secondary audience will be the affiliated entities such as the CTM and the UPWs. The tertiary audience will be stakeholders such as the GIE and the public who can access the information from Algeria Post's website.
● Reporting frequency	The indicator is reported monthly.
● Reporting formats	The report should be in a numerical form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
● Notifications/ workflows	The departments are notified through their emails and/or fax. The monitoring team will send reports to the electronic payment division and postal financial services directorate about the delivered POSes, the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all delivered POSes are declared in the server. The information is 100% credible.

❖ **KPI 04:**

Name	The Number of Web Merchants.
Strategic element being assessed	This indicator deals with the e-commerce websites that use Algeria Post's e-payment platform.
Purpose	The purpose of this indicator is to provide insight about the availability Algerian websites that offer citizens a chance to make purchases online. It is needed to establish the positioning of Algeria Post in terms of electronic payment services offers and to monitor their progress.
Data collection method	
● Formula and/or scale	The provided data is going to be numerical as it will be related to the number of websites that use Algeria Post's e-payment platform.
● Source of data	The data is going to be collected form Algeria Post's Smart Vista solution where the web merchants are declared and monitored.
● Frequency	The collection should be continuous.
● Data entry	It is provided by the monitoring team in the CTM.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-
Reporting/notifications	
● Audience/access	The primary audience is the electronic payment division and

	postal financial services directorate who is the main actor that makes decisions concerning the distance payment strategy. The secondary audience will be the affiliated entities such as the CTM. The tertiary audience will be stakeholders such as the GIE and the public who can access the information from Algeria Post's website.
• Reporting frequency	The indicator is reported every trimester.
• Reporting formats	The report should be in a numerical form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The monitoring team will send reports to the electronic payment division and postal financial services directorate about the web merchants who are successfully using the e-payment platform, the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all web merchants that have access to the e-payment platform are declared in the server. The information is 100% credible.

❖ **KPI 05:**

Name	The Number of ATM Transactions.
Strategic element being assessed	This indicator assesses the transactions that citizens make in an Algeria Post ATM and how much operational and useful it is perceived.
Purpose	The purpose of this indicator is to analyze the ATM activities and how frequent they are used. It is needed to establish the positioning of Algeria Post's ATMs functioning and monitor its progress.
Data collection method	
● Formula and/or scale	The provided data is going to be mixed between numeral providing the number of transactions, ordinal as it will be related to the evolution of transactions recorded by Algeria Post's ATMs, and ratio as it will provide details about successful and failed transactions.
● Source of data	The data is going to be collected from Algeria Post's Smart Vista solution where ATMs are monitored. They can also be collected from the recorded reports sent to UPWs by the ATM receivers.
● Frequency	The collection should be continuous and daily reported.
● Data entry	It is provided by the ATM monitoring team in the CTM and the ATM receivers who record transactions.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance	-

thresholds	
Reporting/notifications	
• Audience/access	The primary audience is the electronic payment division and postal financial services directorate who is the main actor that makes decisions concerning the ATM strategy. The secondary audience will be the affiliated entities such as the CTM and the UPWs. The tertiary audience will be stakeholders such as the GIE and the public who can access the information from Algeria Post's website (The ratios of successful and failed transactions are restricted from the public).
• Reporting frequency	The indicator is reported daily.
• Reporting formats	The report should be in a numerical and graphic form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The monitoring team will send detailed reports to the electronic payment division and postal financial services directorate about the ATM transactions (successful and failed transactions), the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all ATM transactions are recorded. The information is 100% credible.

❖ **KPI 06:**

Name	The Number of POS Transactions.
Strategic element being assessed	This indicator assesses the transactions made using Algeria Post's proximity payment tools, specifically commercial POSes, and how much operational and useful it is perceived.
Purpose	The purpose of this indicator is to analyze the POS activities and how frequent they are used. It is needed to establish the positioning of Algeria Post's POS functioning and monitor its progress.
Data collection method	
● Formula and/or scale	The provided data is going to be mixed between numeral providing the number of transactions, ordinal as it will be related to the evolution of transactions recorded by Algeria Post's commercial POSes, and ratio as it will provide details about successful and failed transactions.
● Source of data	The data is going to be collected from Algeria Post's Smart Vista solution and the Terminal Management System where POS activity is monitored.
● Frequency	The collection should be continuous and daily reported.
● Data entry	It is provided by the monitoring team in the CTM.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-

Reporting/notifications	
• Audience/access	The primary audience is the electronic payment division and postal financial services directorate who is the main actor that makes decisions concerning the POS strategy. The secondary audience will be the affiliated entities such as the CTM. The tertiary audience will be stakeholders such as the GIE and the public who can access the information from Algeria Post's website (The ratios of successful and failed transactions are restricted from the public).
• Reporting frequency	The indicator is reported daily.
• Reporting formats	The report should be in a numerical and graphic form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The monitoring team will send detailed reports to the electronic payment division and postal financial services directorate about the POS transactions (successful and failed transactions), the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all POS transactions are recorded. The information is 100% credible.

❖ **KPI 07:**

Name	The Number of Distance Payment Transactions.
Strategic element being assessed	This indicator assesses the transactions made using web merchants that have access to Algeria Post's e-payment server, and how much operational and useful it is perceived.
Purpose	The purpose of this indicator is to analyze the web merchants' activities and how frequent citizens make their purchases online using *EDAHABIA* cards. It is needed to establish the positioning of Algeria Post's e-payment solution's functioning and monitor its progress.
Data collection method	
● Formula and/or scale	The provided data is going to be mixed between numeral providing the number of transactions, ordinal as it will be related to the evolution of transactions recorded by the e-payment server that the web merchants have access to, and ratio as it will provide details about successful and failed transactions.
● Source of data	The data is going to be collected from Algeria Post's Smart Vista solution where web merchant activities are monitored.
● Frequency	The collection should be continuous and daily reported.
● Data entry	It is provided by the monitoring team in the CTM.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-

Reporting/notifications	
• Audience/access	The primary audience is the electronic payment division and postal financial services directorate who is the main actor that makes decisions concerning the distance payment strategy. The secondary audience will be the affiliated entities such as the CTM. The tertiary audience will be stakeholders such as the GIE and the public who can access the information from Algeria Post's website (The ratios of successful and failed transactions are restricted from the public).
• Reporting frequency	The indicator is reported daily.
• Reporting formats	The report should be in a numerical and graphic form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The monitoring team will send detailed reports to the electronic payment division and postal financial services directorate about the distance payment transactions (successful and failed transactions), the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all online transactions are recorded. The information is 100% credible.

❖ **KPI 08:**

Name	The Number of Complaints.
Strategic element being assessed	This indicator focuses on the issues that occurred regarding the electronic payment activity and their settlement.
Purpose	The purpose of this indicator is to identify the problems and dysfunctions that can happen during electronic payment transactions and help finding solutions. It is needed not only to establish the positioning of Algeria Post in terms of e-payment activity, but also to set up a baseline for their output deliverables and monitor their progress.
Data collection method	
● Formula and/or scale	The provided data is going to be mixed between numeral providing the number of complaints, ordinal as it will be related to their evolution, ratio as it will provide details about solved and unsolved complaints, and interval since it will assess the time spent to solve these complaints.
● Source of data	The data is going to be collected from the reports sent about the complaint files.
● Frequency	The collection should be continuous and daily reported.
● Data entry	It is provided by the CTM's complaints and customer relationship department which is the main entity that deals with the complaints, the receiver who records the complaints regarding ATM issues and the UPWs who receive complaints from cardholders.
Ownership	Algeria Post's electronic payment division is the true owner that

	will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-
Reporting/notifications	
• Audience/access	The primary audience is the electronic payment division and postal financial services directorate who is the main actor that makes decisions concerning electronic payment strategy. The secondary audience will be the affiliated entities such as the CTM and the UPW. The tertiary audience will be the stakeholders that are involved in the electronic payment activity such as the GIE and SATIM. This information is restricted from the public.
• Reporting frequency	The indicator is reported daily.
• Reporting formats	The report should be in a numerical and graphic form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The receiver will send a report to the UPWs about the complaints that concern the ATMs, the UPW will add them to other complaints that they received and send detailed reports to the CTM's complaint and customer service department, this department will in turn add them to the complaint that they received and they will send it to the electronic payment division and postal financial services directorate, the data will be processed and reported to the audience.

Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all complaints are recorded. The information is 100% credible.

❖ **KPI 09:**

Name	The Number of Fraud Cases.
Strategic element being assessed	This indicator focuses on the identification of fraud cases that Algeria Post may encounter during electronic payment transactions.
Purpose	The purpose of this indicator is to identify fraud cases and improve the security of Algeria Post's e-payment system. It is needed to establish the positioning of Algeria Post in terms of e-payment security and monitor its progress..
Data collection method	
● Formula and/or scale	The provided data is going to be mixed between numeral providing the number of fraud cases and ordinal as it will assess their evolution.
● Source of data	The data is provided from the fraud server who tracks all the fraud cases.
● Frequency	The collection is done continuously.
● Data entry	The CTM's cards and electronic payment fraud department will provide this data.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-
Reporting/notifications	

• Audience/access	The primary audience is the electronic payment division and postal financial services directorate who is the main actor that makes decisions concerning electronic payment strategy. The secondary audience will be the affiliated entities such as the CTM and the UPW. The tertiary audience will be the stakeholders that are involved in the electronic payment activity such as the GIE. This information is restricted from the public.
• Reporting frequency	The indicator is reported weekly.
• Reporting formats	The report should be in a numerical form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
• Notifications/ workflows	The departments are notified through their emails and/or fax. The cards and electronic payment fraud team will send detailed reports to the electronic payment division and postal financial services directorate about the recorded fraud cases, the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all fraud cases are recorded in the server. The information is 100% credible.

❖ **KPI 10:**

Name	The Number of Adhering Members to Algeria Post's *BARIDI MOB* App.
Strategic element being assessed	This Indicator assesses how many people subscribed to Algeria Post's *BARIDI MOB* app and rely on its services.
Purpose	The main purpose behind this indicator is to provide analysis about how many people rely on the electronic payment services through their mobile devices, and how effective its use is. It is needed to help monitor the progress and delivery of Algeria Post's strategy which is promoting the scriptural payment means.
Data collection method	
● Formula and/or scale	The data will be measured in a nominal form by the numbers provided about the subscribers to the app.
● Source of data	It is available through the application's back end where such information is recorded.
● Frequency	The collection is done continuously.
● Data entry	The managers of the app are the providers of the data.
Ownership	Algeria Post's electronic payment division is the true owner that will manage this indicator and incorporate it in their strategy.
Targets and performance thresholds	-
Reporting/notifications	
● Audience/access	The primary audience is the electronic payment division and

	postal financial services directorate who is the main actor that makes decisions concerning the payment card's strategy. The secondary audience will be the affiliated entities such as the CTM. The tertiary audience will be other stakeholders such as the GIE and the public who can access the information from Algeria Post's website.
● Reporting frequency	The indicator is reported monthly.
● Reporting formats	The report should be in a numerical form presented in a dashboard including all other measured indicators to be compared with previous results and analyze the progress of the activity.
● Notifications/ workflows	The departments are notified through their emails and/or fax. The app managers will send detailed reports to the electronic payment division and postal financial services directorate about the app activity the data will be processed and reported to the audience.
Expiry/revision date	The indicator can be reviewed yearly for updates if necessary.
Cost estimate	-
Confidence level	The confidence level is good since all data is recorded in the back end of the app. The information is 100% credible.