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Analysis of the digital transformation in the public transport sector

Case of 'Etuspay' electronic payment in the Wilaya of Tiaret

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Abstract:

The study we have conducted concerns the analysis of the digital transformation in the public transport sector. Hence, our problematic was articulated around the presentation of an inventory of fixtures as of the use of electronic payment "Etuspay" in urban public transport (buses) in the Wilaya of Tiaret. In order to do that, we used a quantitative methodthrough a survey of 50 inhabitants of the region.

The results obtained show that public transport users adhere to the new "Etus pay" system and that the parameter of trust in this method hardly constitutes an obstacle to its use.

Key words: Public Transport, Electronic Payment, Etus Pay, Bus, Tiaret.
JEL Classification Codes: R41, E42.

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1. Introduction

The XXI century has been marked by several transformations that have occurred through a globalized economy and were amplified by a very rapid and innovative development. One of the main factors of these changes is the process of digitalization, in which the New Information and Communication Technologies (NICT) are becoming nowadays a real strategic lever for companies, as well for the economies of different countries.

Among the latter is Algeria, which aims to revitalize its economic policy and comply with the new universal trends, particularly by focusing on digitalization in strategic sectors such as public transportation. Therefore, we oriented our study towards the analysis of the digital transformation in the public transport sector, and we will address the issue at hand, which we have defined as following :

What is the current status of the use of electronic payment "Etus pay" in the urban public transport (buses) in the Wilaya of Tiaret ?

In result to this problematic, the following subsidiary question were issued:

1. What is the degree of adhesion of public transport users (buses) in the wilaya of Tiaret to this new electronic payment method "Etus pay" ?

2. What are the obstacles to this new payment method?

In order to provide temporary answers, we propose the following hypotheses:

H1 : The users of public transport (buses) in the wilaya of Tiaret strongly adhere to the new electronic payment method "Etus pay".

H2 : The lack of trust is the main obstacle to the use of electronic payment "Etus pay" in public transport in the wilaya of Tiaret.

In order to test our hypotheses and provide an adequate answer to our questions, we opted for a quantitative research methodology consisting of a field study conducted through a survey 50 users of urban public transport (buses) in the wilaya of Tiaret.

2. Digital transformation in the public transport sector: a challenge for Algeria

In a connected world dominated by new technologies, digitalization, virtualization as well as digital revolution have become everyday notions used in the

social, most especially economic environment. Nowadays, digital transformation represents a major challenge for companies of all sizes, regardless of their sector of activity. This digitalization will lead to major changes in work processes and relationships, but it doesn't exclude challenges of implementation.

This concept focuses on an innovative aspect, making it possible to offer the best possible quality of service with a view to continuous improvement, while emphasizing on the facilitating aspect in the various strategic areas, including public transport.One of the key parameters in this policy is e-payment, which is now becoming omnipresent in any operation where a transaction is required, making travelling more fluid and convenient for public transport users. Digital transformation has thus been the focus of several studies as well as the factors involved in the issue, and its evolution has led to a rapid, but also essential, intrusion into the corporate domain, which will be the subject of this part of the article.

2.1. Digital transformation:

As we have previously mentioned, digital transformation is at the heart of the different processes undertaken today in multiple sectors and has thus aroused the interest of several researchers, who have studied the issue and who will be the subject of our synthesized literature review.

2.1.1. Literature review:

The research that has been conducted by several authors, on the subject of digital transformation, has had the purpose of understanding the nature of possible developments of the latest trends in the field of new technologies.

The notion of digital transformation varies from one company to another, which explains the absence of a standard and universal definition applicable to each company.

However, researchers who have worked on the issue agree that digital transformation consists of the use of technology to build business models based on customer expectations (AZIZ T.J., 2020).

For others (Bonnet, & Ferraris, 2011; 2019; Vial, 2019), this transformation is cultural in nature and pushes organizations to evolve through the use of new practices

in exchange for the old ones usually used, and to instill risk taking as an inseparable part of the strategies built†.

A third point of view is put forward by Hanelt et al. who see digital transformation as an organizational change triggered and shaped by the transversal immersion of the digital aspect within companies. This change will consist of a movement towards flexible organizational models introduced in digital business ecosystems that steer them. In addition, Fethi FERHANE (2017) supports the idea that digital transformation involves a revolution in several practices where the integration of digital technologies will be liable‡.

We can thus establish that even if the definitions given diverge in certain aspects, they all tend to highlight a differentiating element that constitutes a long-term competitive advantage, which will be the source of the achievement of objectives in an effective, efficient and high-performance manner.

2.1.2. The concepts surrounding digital transformation:

There are certain notions often used, or even confused, with digital transformation. These include those of digitization and computerization, which Aurélie Dudezert (2018) points out to avoid this confusion:

- **Digitalization** consists in the encryption of information in digital language, in order to make the procedures automatic and practical, at the appropriate level of the exchanges and the working methods within the company. It aims to simplify and automate processes and interactions within the organization;
- **Computerization** mainly refers to the introduction of information within the framework of software and computer systems within organizations, so that the automation becomes an integral and inseparable part of the methods and tools involved;

†In Digital transformation of companies: Proposal of a global theoretical framework for understanding Ridouane Ejbari, Jamal Bouali

‡Hanelt, A., Bohnsack, R., Marz, D., & Marante, C. A. (2020). A Systematic Review of the Literature on Digital Transformation : Insights and Implications for Strategy and Organizational Change. Journal of Management Studies, n/a(n/a). https://doi.org/10.1111/joms.12639

- As for **digital transformation**, it concerns the implementation of management and communication systems and the transmission of sources and media allowing to increase the level of information and knowledge, with the aim of integrating more modern, innovative and efficient working methods.

2.1.3. The implementation of a digitalization process:

As with any integration of a new system, the implementation of a digitization process is delicate and must meet certain criteria in order to meet the target expectations. For Daniel BOUGNOUX, two imperatives must be respected: the determination of the technical requirements as well as the follow-up throughout the installation phase of this system by means of fluid communication and training, while ensuring that there is hardly any discrepancy between the content of the programs and the digital reality of the field.

ABID Nabila (2021) explains for her part that digital transformation depends on several elements that represent the key success factors of this project, in terms of employee involvement, granting more freedom to team managers, working with utmost transparency and using easy methods, setting SMART objectives to be achieved efficiently and setting up a roadmap including the whole set of indicators of the digital transformation process.

2.2. Public transport in the age of digitalization:

Public transport, like all other sectors, has also been affected by digitalization. The introduction of this process is a delicate phase that needs to be done carefully and meticulously.

2.2.1. The introduction of digitalization in public transport:

Nowadays, information represents one of the most strategic resources of the mobility systems involving transport, whether it's at the of multi-modal or inter-modal scale (Bertrand MOULY-AIGROT, 2016). These offers relying on coordination are arranged at the level of local transport but could also be flexible when it comes to travel and long-distance trips.

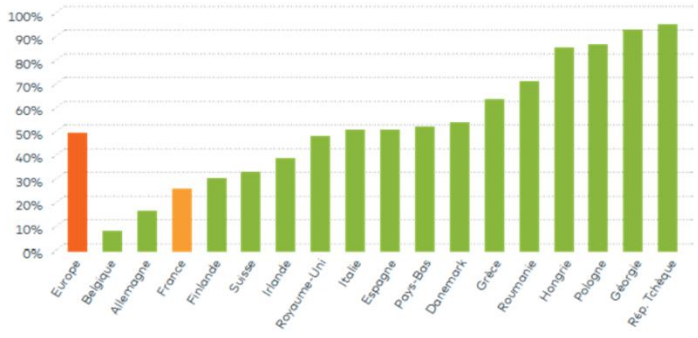
Michael ENGLISH (2021) explains that in order to start a digitalization phase in a reactive way, it is crucial to facilitate payment practices and tools in order to make integrated mobility services more convenient, by focusing on simplifying pricing methods in order to increase and stabilize traffic, updating payment methods so that customer usage is optimal, anticipating future developments in this area and focusing on cohesion by setting up a space for these offers.

Several definitions have been attributed to electronic payment as resulted of multidisciplinary studies concerning it. We will cite those conducted by ALDAAS, which defines electronic payment as "a payment for goods or services via the Internet. This includes all financial transactions made using electronic devices such as computers, smartphones and tablets" (ALDAAS, 2021, p. 409).

BENMADANI (2022) presents electronic payment as any transaction, in real time, carried out electronically within the scope of a commercial operation of sale and purchase of tangible products or services, using sophisticated digital tools, such as the TEP (Terminal of Electronic Payment), PIN codes, contactless payments or those carried out on applications and online sales sites.

As an illustration, we can cite the use of electronic payment in Europe, where it represents an inseparable part of the culture of consumption and marketing of several countries, such as the Czech Republic and Georgia, where it has reached its peak, in addition to a widespread use in other countries with a percentage that varies between 10 and 70 (Mastercard, September 2019).

Figure 1 : Percentage of contactless payments made among card payments



Source : Mastercard, 2019

2.3. Digitization applications in public transport :

The practices of digitalization have been immersed in public transport and this has been based in parallel on several researches, before being applied in multiple countries around the world, first in developed countries, before arriving at those being in the process of development, as it is the case for Algeria.

2.3.1. The digitalization of the public sector: a new policy with multiple challenges :

The digitization of public services is a strategic lever on which States rely in order to energize the management of their economy and place their companies in a state of continuous evolution (Calay V.M., 2019). For their part, the UN welcomes and supports this approach, indicating that digitalization is considered one of the major axes of sustainable development, raising encouraging results regarding the insertion of digitalization practices in the public services sector and which should also be a key tool for strengthening during sensitive phases (Chafik Khalid, 2020).

There are other issues that digitalization must address, such as the increase in the levels of demand of the various economic factors that compel public services to conform to these new systems and modes of production and consumption. (JOUARNI, 2020). The same author certifies that this will only be possible if we invest in the human factor, the culture of change as well as both forms of innovation: process innovation and product innovation (Jean BEUVE, 2021).

2.3.2. Digitization of the public sector in Algeria:

The Algerian economy has always been known for its dependence on hydrocarbons which represent nearly all of its exports as an indication. However, a new policy has been put in place to create a new diversified economic fabric where digitization is becoming increasingly important. In this same optic, the Ministry of Digitization and Statistics has been created for this purpose, especially in an era that relies heavily on entrepreneurship.

More than 90% of the start-ups that have emerged recently are operating in the digital field and some even manage to forge professional relationships abroad

(BELKHIR, 2022). However, and based on the same study, we note that the taxes related to the acquisition of the sought digital devices are very high, which creates barriers to the desire of breaking the traditional model and developing digital services in a country that aspires to represent a digitized society, with the aim of setting up a center to host public data as part of a global vision of digital transformation.

It is important to note that Algeria has been the initiating country in the establishment of an entity responsible for conducting installations and accompanying computerization projects in public sector companies. The launch on the market of certain companies, such as Algeria Telecom and Algeria Post, or other services, such as the regulator of posts and electronic communications and the market of foreign mobile operators to improve access to communications services, perfectly represent an initiating and important stage in the emerging digital economy itself (ABID, 2021).

Algeria's strategy in this area has undergone a perpetual evolution over the past fifteen years, with in particular that named e-Algeria which counts new technologies as one of its main foundations, and also the launch, two years later, of biometrics, in addition to the boom experienced by e-commerce, as well as the evolution of these practices at the state level, with about fifteen national organizations having launched the digital transformation (A. KAHLANE, 2018). But where does digitalization stand in the public transport sector in Algeria?

3. Methodology and research materials:

The purpose of our study is to analyze the digital transformation in the public transport sector. To do so, we have chosen as a case study the electronic payment via an application called Etus pay, in the wilaya of Tiaret. To this end, we have performed a survey in this regard with 50 individuals using this service.

3.1. Research field :

The General Corporation for Urban and Semi-Urban Transport of Tiaret City is an industrial and commercial company, located in the industrial zone of the Wilaya of Tiaret and whose surface area is about 26 154 square meters. This entity was founded on January 10th, 2008, following the presidential decree n° 06-500 of December 24th,

2006, concerning the creation of public institutions for urban and semi-urban transports. The official launch of the activity took place three months later, with a fleet of 33 buses providing six urban lines and one semi-urban line§.

The main objective of the foundation is to provide and regularly improve the services in order to highlight the best possible process of mass public transport of citizens, meeting all the requirements needed in terms of safety and comfort, but also, achieving a high level of performance in order to live up to the expectations of customers and meet their needs and requests adequately and efficiently.

In order to live up to these ambitions and achieve a visionary view of the intelligent enterprise, this economic actor relies heavily on the integration of new technologies as a strategic lever aiming to create a positive and ideal climate for the practical and sustainable joint transfer that contributes to the social and economic development of our state - Tiaret.

This is where the "Epay" project comes in, as it is the simplest way to board a bus and pay without having to use the traditional cash payment method. All that customers will need to do is simply swipe the "my bus" card in the clutch device designed for this purpose, or they can use the application that may be downloaded to their phone. In this way, the amount for the journey made will be automatically deducted from the balance of the card or the "my bus" application already recharged.

3.2. Survey method:

The main objective of our study is to provide an overview of the electronic payment system for urban public transport in the wilaya of Tiaret. To do so and in view of the circumstances relating to the time constraint and the sanitary situation, we limited ourselves to a study sample composed of 50 individuals living in Tiaret and using public transport as well as the Epay system, to fill in our questionnaire which was displayed on "Google forms" and distributed electronically via the different social networks.

§ Internal company documents.

3.2.1. The Quantitative Study:

In order to better assess the analysis of the digital transformation in the public transport sector through the new concept of "electronic payment", we have chosen a descriptive method, through a quantitative study to test our initial hypotheses and answer our problematic.

Quantitative research represents the collection and combination of information, quantifiable/measurable facts or social facts that can be converted into tables, statistics and graphical data. This type of research is based on the measurement of opinions through surveys and questionnaires. (FRIEDRICH-EBERT-STIFTUNG, 2016). Our goal will then be to evaluate the company's data and take action to help the Department involved to better manage this new experience.

3.2.2. The survey questionnaire:

In accordance with the favored method, we opted for the questionnaire as a tool to optimally carry out our study and provide us with the necessary information in order to test our hypotheses and present the expected results and analyses.

"The main function of the questionnaire is to widen the scope of the survey and to test statistically the generalizability of the information and hypotheses previously developed.". (Jean-Claude., 2007, pp. 33-44)

The tool chosen is a questionnaire composed of 18 questions on four main axes of research previously defined and related to our initial inquiries. We used simple and common words to formulate four types of questions: closed-ended questions to frame the answers and capture the survey measures with more precision, single-answer closed-ended questions that aim to obtain answers that are as simple and straightforward as possible on a range of expected judgments, and multiple-choice questions that bring out the precise opinion and facilitate the task of the respondent and the interviewer.

3.3. Analysis tools:

In view of the nature of our study, we opted for two main tools to help us proceed with the analysis of the data collected. These are "Microsoft Office Excel" and "the SPSS

software". SPSS, stands for « Statical Package for the Social Sciences », is a software used for static analysis and includes several modules, such as basic layout, regression models, advanced models, tables, exact tests, tendancies and others. Other methods were used to provide a more in-depth and cross-sectional analysis of the data, such as :

- **KHI-SQUARE :** The KHI-SQUARE , also known as the Chi 2, Chi square or test of independence, is used when there are two groups (or two measures) in the research and the dependent variable is qualitative. The KHI 2 is tested to compare the frequencies of these two groups in order to conclude the existence of a relationship between said groups: X and Y. It allows the null hypothesis to be maintained or rejected and therefore to make a conclusion.
- **Likert scale :** A Likert scale is a psychometric tool that measures an attitude in individuals. It takes its name from the American psychologist Rensis Likert who developed it. It consists of one or more statements for which the individual interviewed expresses his or her degree of agreement or disagreement.

3.4. The content of the survey:

As mentioned earlier, we used an 18 questions electronic survey via "Google Forms" and published it through different social networks.

The questions posed in the latter were grouped into four parts that are relevant to our study subject, namely:

- Part 1 : Analysis of the results related to the respondents' situation
- Part 2 : Profile and technology assessment
- Part 3 : Analysis of results by payment method and EP knowledge
- Part 4 : Analysis of the results of Etus pay

The objective behind this process is to obtain all the necessary information related to the four axes of the above-mentioned study, which will then be analyzed by the sorting methods. The results obtained will allow us to have more visibility and a picture of the reality of the field regarding the studied phenomenon.

3.5. Survey sample:

Regarding the survey sample, we will present two important elements:

3.5.1. The sample size:

Our sample is composed of 50 individuals from a population of Tiarti citizens with diverse profiles. They use public transport and the Etus pay application as a means of payment, which are two key criteria that our study population must meet.

3.5.2. Main characteristics of the sample:

The main characteristics of the sample are as follows:

- **Vehicle disposal:** 78% of the individuals of the population have no means of transport and 22% have vehicles.
- **Use of public transport :** 96% of Tiarti respondents use public transport and only 4% do not.
- **Socio-professional categories:** our sample is very heterogeneous and is composed of 41.7% students, 29.2% government employees, 18.8% unemployed, the same proportion of 4.2% students and retired people and 2.1% senior executives.
- **Use of means of transportation and frequency:** 75% of the individuals surveyed use different means of transportation on a daily basis, such as cabs (48%), trains (16%) and other means (4%), but the one that is most used at a high proportion of 96% is the bus.
- **The possession of a smartphone connected to the internet:** all of the people interviewed in the framework of our study have a cell phone and an internet package.

4. Findings and Discussion:

The processing and analysis of the results followed the previously defined axes. We will start by highlighting those related to the key concepts of our empirical study, namely the use of public transport and of the Etus pay application, before studying the main correlations through cross-sorting.

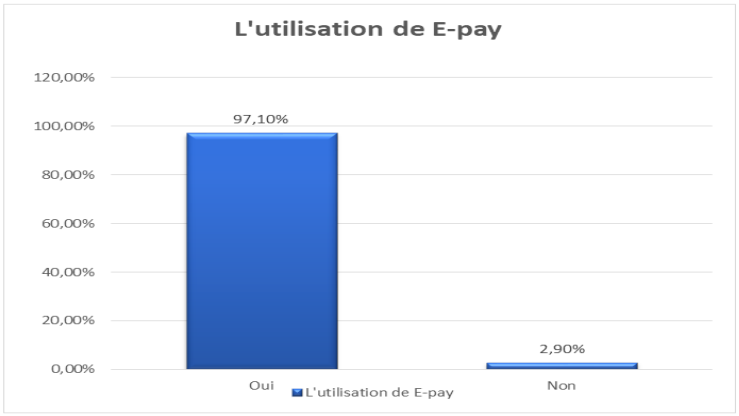
4.1. Analysis of the results related to payment methods and the Etus pay application:

The main results obtained and considered to be the most relevant are as follows:

4.1.1. The use of the Etus pay payment application in public transport :

The use of the Etus pay payment application in public transport, by our sample population, is represented by the following figure:

Figure 2 : Use of the Etus pay payment application in public transport



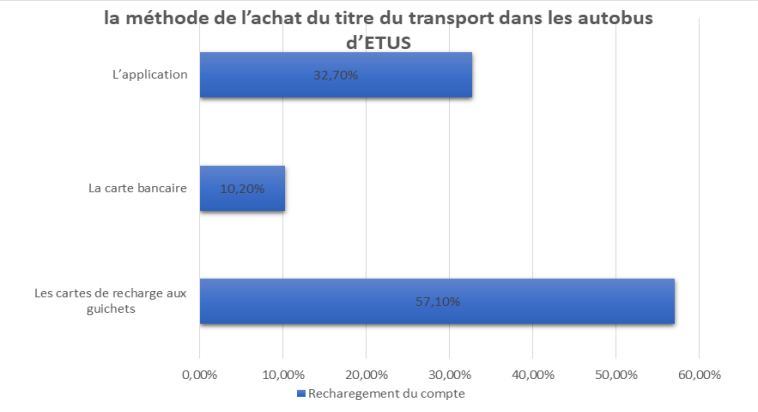
Source: constructed by the authors

As we can see in the figure above, more than 97% of our sample are aware of the Etus pay application, which they report using very regularly, either on a daily or weekly basis.

4.1.2. Account reloading preferences:

The preferences regarding the method of purchase of transportation tickets of ETUS buses are shown in the following figure:

Figure 3 : Method of purchasing tickets on ETUS buses



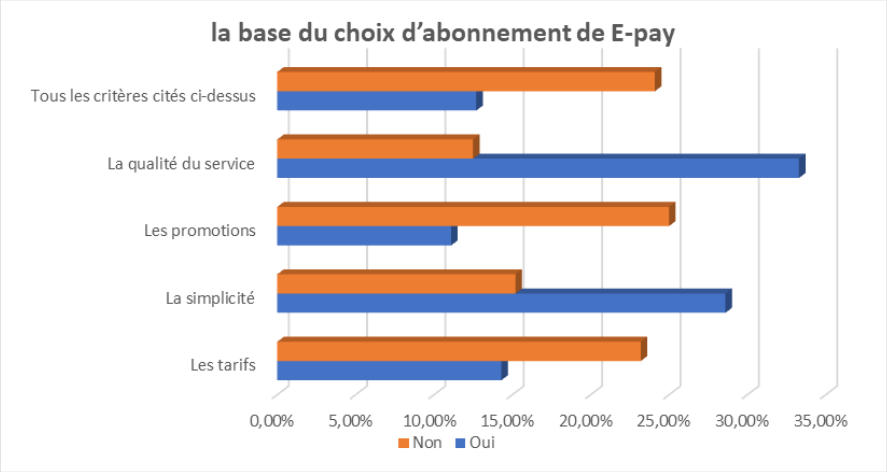
Source: constructed by the authors

We note that more than half of the Tiarti concerned by our study, i.e. 57.1%, use recharge cards at the counter, while 32.7% prefer to use the application. For the remaining 10.2%, the bank card is the preferred method. We can thus conclude that public transport users are beginning to move away from the traditional payment method of cash and are becoming more familiar with electronic payment methods, including the Etus pay application.

4.1.3. The basis for choosing an Etus pay subscription:

The main criteria and motivations supporting the choice of the Epay subscription by our sample are summarized in the following figure :

Figure 4 : Criteria for choosing the Epay subscription



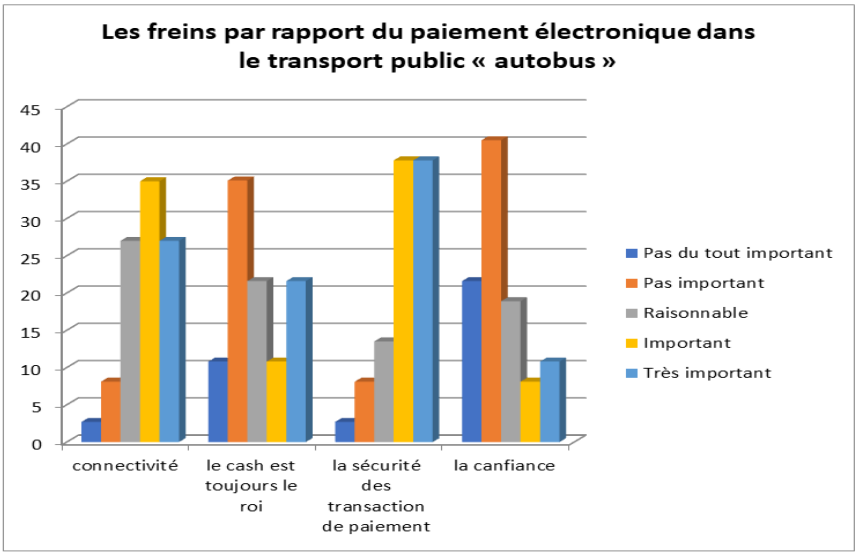
Source: constructed by the authors

Summarizing the exposed results, we realize that the most stimulating criterion to use the Epay is the quality of service for 33.3% of the individuals. Simplicity is the second most important criterion for 28.6% of the participants in our study. The prices come in third place with a percentage equal to 14.3%, while in fourth place, there are several other criteria that the figure shows and whose rate represents 12.7%, in addition to the prices that equal only 11.1%.

4.1.4. The obstacles encountered by our sample when using electronic payment "Etus pay" in public transportation "buses" :

The main obstacles encountered by the individuals participating in our study when using the electronic payment "Etus pay" in public transport "buses" are as illustrated in the figure below :

Figure 5 : Obstacles encountered by our sample when using electronic payment "Etus pay" in public transportation "buses" :



Source: constructed by the authors

In order to determine the levels of consent of individuals on this question, we will resort to the following statistical tools :

- The arithmetic mean: to identify and compare the average responses of the individuals in our sample on the scale items;
- The standard deviation: to allow us to show the dispersion of the individuals' answers: the closer its value is to zero, the more the answers are articulated around the degree of the arithmetic mean and its non-dispersion.

The intervals obtained from each orientation are represented by the following table (table 1):

The results that emerged and were diagrammed were of great help in presenting the obstacles for each axis according to the degree of importance, based on the value of the arithmetic mean in the dimension. It should be noted that when the mean is

identical between two items, the minimum value of the standard deviation between the two items is the one taken into account Thus, we were able to classify the identified obstacles according to their degree of importance. The security of payment transactions comes out on top; where we recorded an arithmetic mean equal to 4.00 with a standard deviation of 1.054. This dispersion is greater than one indicating a concentration of individuals' responses surrounding the arithmetic mean that belongs to the interval of 3.4 to 4.19, which signifies a high degree of importance for this reason. In fact, this estimation is due to the fact that 37.8% of the respondents chose the degrees "Very important" and "Important", 13.5% consider it to be "Reasonable", while those who chose "Not important" represent a proportion of 8.1%, the remaining percentage of 2.7% belongs to those who consider this process to be "Not at all important".

Table 1 : Range of the five-point Likert scale

Range	Interpretation
From 1 to 1,79	Not at all important
From 1,8 to 2,59	Not important
From 2,6 to 3,39	Reasonable
From 3,4 to 4,19	Important
From 4,2 to 5	Very Important

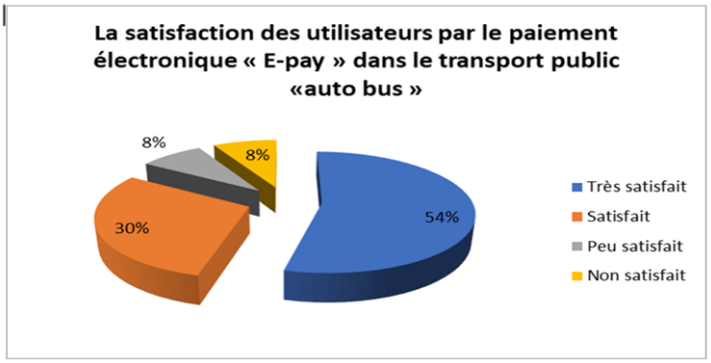
Source : Table developed by the researchers

Following the same logic and based on the results presented on this aspect, we were able to note that "Connectivity" represents the second obstacle to the implementation of the "Etus pay" system, followed by the obstacle of cash, that is still considered the most convenient and widespread method, as well as trust, which ranks last, to the extent that some consider it an advantage, unlike the other proportion that considers the opposite.

4.1.5. User satisfaction with electronic payment "Etus pay" in public transport "buses":

The figure below shows the level of satisfaction of users of the "Etus pay" electronic payment service in public transport "buses»:

Figure 6 : User satisfaction with electronic payment "Etus pay" in public transport "buses"



Source: constructed by the authors

The observed results show a rate of 54% of individuals satisfied with the electronic payment "Etus pay" in the public transport "bus". For the remaining half of the population, 30% are not very satisfied, while the same proportion of 8% represents those who are very satisfied and those who are not at all satisfied. The proportions presented show that the service has an average satisfaction rate that does not exceed expectations and in many cases does not live up to them.

4.2. Bivariate analysis of the correlation between the main study criteria:

The main results concerning the correlations between the key variables of our study, and in relation to our initial hypotheses, are structured around the following points:

4.2.1. Assessment of the adherence of the users of the public transport "bus" of the wilaya of Tiaret to this new electronic payment mode:

In order to investigate whether public transport bus users adhere to the "Etus pay" electronic payment system, we will cross-reference a few questions:

- **Cross-referencing the use of public transport with the electronic payment method :**

  After analyzing the results of each question by flat sorting, we selected question Q1.2 (Do you use public transportation?) with question Q3.1 (What payment method do you use to purchase a ticket ?) to assess the reliability of the first hypothesis.

Table 2 : Cross table of the use of the means of public transport * the means of payment in public transport

			Q1.2		Total
			Cash	Electronic Payment	
Q3.1	No	Effectif	0	0	**0**
		% of the total	0,0%	0,0%	**0,0%**
	Yes	Effectif	11	37	**48**
		% of the total	22,9%	77,1%	**100,0%**
Total		**Effectif**	**11**	**37**	**48**
		% of the total	**22,9%**	**77,1%**	**100,0%**

Source: Elaborated from the SPSS software V28

We first note that Cochran's rule which states that there should be no theoretical frequencies greater than 20% and at most 100% can be greater than 10; is verified. The results show that after reducing the number of respondents through conditional questions, we find that all individuals use public transport, 77.1% use electronic payment to purchase their tickets and only 22.9% continue to use cash. It is therefore quite clear that the relationship between the two variables is verified.

Based also on the Chi-Square tests, we notice that the probability value Sig. 0.001 is strictly lower than the threshold of the test 0.05, which leads us to add the null hypothesis and accept the alternative hypothesis that states that there is a statistically significant relationship between the use of public transport and the use of the electronic payment service "Epay" in the Wilaya of Tiaret. In this same sense, the symmetrical measures of the Chi-square test, such as Phi and Cramer's V which measures the strength of the relationship, show that the relationship between the two variables is acceptable, being equal to 0.577.

- **Cross-referencing the use of the "bus" means of public transportation with the suggested means of payment:**

After analyzing the results of each question by flat sorting, we selected question Q2.2 (What means of public transportation do you use?) with Q3.1 (What means of payment do you use to purchase a ticket?) to assess the reliability of the first hypothesis:

Table 4 : Cross table of the use of the public transport means "bus" with the suggested means of payment

			Q3.1		Total
			Electronic Payment	Cash	
Q2.2	Yes	Effectif	37	10	47
		% of the total	78,7%	21,3%	100,0%
	No	Effectif	0	1	1
		% of the total	0,0%	100,0%	100,0%
Total		**Effectif**	37	11	48
		% of the total	77,1%	22,9%	100,0%

Source: Elaborated from the SPSS software V28

The table above shows that 37 people in our sample who use buses also use the electronic payment system "Etus pay" to buy their tickets, with a rate of 78.7%, compared to 21.3% who pay for their tickets in cash.The relationship between the use of public transport "buses" and the electronic payment, is significant (p value <0.005), which explains that the users of the public transport "bus" use the electronic payment "Etus pay" to buy tickets.By proceeding to the symmetrical measures, we notice that the value of Cramer's V is 0<0.621<1, which explains that the relationship between the electronic payment in public transport and the means of public transport "bus", is strong.Therefore, we can confirm the result of Chi-square: the relationship between the means of public transport bus and the electronic payment "Etus pay" is statistically significant, and of strong magnitude. The results obtained show that there is a relationship between the electronic payment "Etus pay" and the use of public transport. We can therefore confirm our first hypothesis, which states that "Users of public transport 'buses' in the wilaya of Tiaret strongly adhere to this new electronic payment method 'Etus pay' ".

4.2.2. Evaluating the correlation between the adherence of users of public transport "bus" in the wilaya of Tiaret and the confidence brake :

In order to verify our second hypothesis, we will try to work on the intersection between the trust barrier, on which the latter is based, and the use of the "Etus pay" electronic payment.

After analyzing the results of each question by a flat sorting, we selected question Q4.2 (Do you use Etus pay?) together with question Q4.5 (Do you trust Etus pay?) to assess the reliability of the second hypothesis:

Table 5 : Cross table of the use of the electronic payment " Etus Pay " with the criterion of trust in this practice

		The use of Etus pay				Total	
		Yes		No			
		N	%	N	%	N	%
Trust	Do not Agree at all	1	2,9%	0	0,0%	1	2,9%
	Do not Agree	8	20,0%	0	0,0%	8	2,00%
	Agree	22	60,0%	0	0,0%	22	60,0%
	Totally Agree	6	17,1%			6	17,1%
Total		37	100,0%	0	0,0%	37	100,0%

Source: Elaborated from the SPSS software V28

First, we find that Cochran's rule explaining that there should be no theoretical frequencies greater than 20% and at most 100%, can be greater than 10; is verified. The results show that the majority of individuals who have positive attitudes towards trust use Etus pay. It is then quite clear that the relationship between the two variables is verified. From the results obtained by the symmetrical measures of the Chi-square test, such as Phi and Cramer's V, it can be concluded that the users of the electronic payment system do trust the "Etus pay" system.

According to the results obtained, we note an existing relationship between the lack of trust and the use of electronic payment "Etus pay" in public transport, which leads us to invalidate our second hypothesis stating that the lack of trust is not the main obstacle to the use of electronic payment "Etus pay" in public transport in the wilaya of Tiaret.

4.3. Discussion of the results:

The first observation we made was that public transport is used by both Tiarti car owners and non-owners, but with different frequencies and proportions. This could be explained by several criteria such as the increase in fuel prices or the lack of parking

facilities. Thus, we can consider that public transport is attractive and represents various advantages that attract several profiles of the population, regardless of their age or socio-professional category,...etc.

Among these profiles are mainly students and employees with the highest proportions of public transport usage, which explains the strong tendency of the latters to use the "Etus pay" service. In other words, we have observed that students are part of the "Y" and "Z" generations, who are very familiar with technology, alongside employees, who use it a lot in their professional activity, which may justify the fact that e-payment is beginning to be popularized and to reach the percentages presented previously. Thus, in this new dynamic based on a modern mode of consumption, we can note that the concept of trust has been deeply established, in the sense that public transport users no longer hesitate to communicate their personal data as well as their bank details, or initially use their cards to make electronic payments or to access the "Etus pay" application.

However, there are several other obstacles that can hinder the development of online payment. To address this, we are going to provide some suggestions, based on the results and analysis of the study carried out, which will be forwarded to the Ministry of Public Transport as well as to the company ETUS Tiaret and to all the entities involved in the "Etus pay" e-payment project in buses in Tiaret.

In this sense, it would be beneficial for the company to:

- Generalize the electronic payment project "Etus pay" in all wilayas;
- Develop the project in other means of public transport;
- Closely monitor the development of this new project;
- Recruit a specialized team to oversee the development of the project;
- Integrate risk management into the project;
- Provide an excellent control framework that allows public institutions to collect the percentage that they cannot get through traditional money;
- Provide a modern service that adapts to current requirements;
- Reduce paper consumption;
- Recruit many more controllers;

- Use other electronic payment technologies such as NFC or M-ticket to be validated via Bluetooth and SMS;
- Create many more ticket offices to provide more tickets;
- Take into consideration the customers' complaints;
- Generalize the project to other public transport companies;
- Expand the internet networks.
- Integrate the National Corporation for the Exploitation of Ground Stations into the platform and allow citizens to book their seats from home through the application;
- Integrate private transporters and cabs into applications so that citizens can use all modes of transport via a digital ticket;
- Integrate Ministry of Transport certified transportation applications with the platform that would generate significant benefits for the application;
- Introduce a sum of taxes that could not have been calculated under the old methods;
- Expand to booking of cruise ships and maritime transportation in case approved by the Ministry;
- Once the app has spread and reached many levels of public consumption, we can move towards an even more distant goal of making the app a source of revenue for the Department, and we can integrate the world of electronic payment outside of the transportation field;
- The application can be used as a payment method by public or private organizations that process electronic invoices;
- The application can also be added as a means of payment on e-commerce sites, or as a means of payment when booking in hotels in Algeria and especially by foreigners;
- The application can also merge with international electronic payment applications so that Algerians can use it anywhere in the world.

5. Conclusion

The study we have conducted allowed us to analyze the digital transformation in the public transport sector, taking as a case study the "electronic payment via the "Etus pay" application in the wilaya of Tiaret. First, we found that public transport is widely used by all categories of society, even if the frequencies are different. Also, the Tiarti are strongly beginning to familiarize themselves with the field of new technologies and digitalization, which explains the high proportions of the use of "bus" and "Etus pay"

services by this population, contrary to what one might initially believe about the obsolescence of certain modes of consumption or payment and the dependence on traditional methods.

In the same sense, we note that the obstacles that may constrain this process are not enough to block users of electronic payment and that trust is not a barrier to its use. Thus, we will return to our initial hypotheses, which were formulated as the following:

- **H1:** Users of public transport "buses" in the wilaya of Tiaret strongly adhere to this new electronic payment method "Etus pay". This hypothesis was **confirmed**, given that the vast majority of individuals in our sample use it and are satisfied with it.
- **H2**: Lack of trust is the main obstacle to the use of electronic payment "Etus pay" in public transportation in the wilaya of Tiaret. This second hypothesis was **invalidated**, as the study revealed that trust is not the main obstacle to this digital payment method, which users consider to be reliable and secure.

Research limitations:

- The first obstacle we encountered concerns the size of our sample of 50 individuals, which may not be greatly representative, in view of the overall population of the Wilaya of Tiaret. This is due to the period of health crisis when the activity of the public transport sector was strongly slowed down and disrupted.
- Our second limitation is that administering the survey electronically was complicated, as we had to use paid tools such as "Facebook adds" to promote our publication and circulate the "Google Forms" link of the survey.
- Finally, the availability of certain information and documentation was made difficult by the state-owned and strategic nature of the company, which makes many aspects of the business confidential.

Research Perspectives:

Several more in-depth and complementary researches could be carried out within the framework of possible future studies, we will cite as a proposal:

- The analysis of the digital transformation in the public transport sector in the country of Algeria, which would allow to have a return and a vision on the use of the "Etus pay" service on the national territory;

- Comparative study on the use of electronic payment in the different means of public transport, which would show where the deficiencies are and where efforts in this direction should be multiplied ;
- Analysis report on the main obstacles to digitalization in public transport and the prospects for its evolution, in order to be able to detect malfunctions and subsequently take appropriate corrective measures;
- The e-payment as a constraint on the development of e-commerce in Algeria, with the aim of putting the finger on the obstacles in this direction and propose real action plans to remedy it;
- Digitalization as the main strategic lever to boost the Algerian economy, mainly in an era that relies on a new economic structure based on entrepreneurship and working to get rid of an economy dependent on hydrocarbons.

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