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Engagement towards mobile-ticketing applications: How do North African mobile users build their engagement through perceived service quality?

Engagement envers les applications de billetterie mobile : Comment les utilisateurs mobiles nord-africains construisent-ils leur engagement à travers la qualité perçue du service ?

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Abstract

Purpose: the aim of this study is to examine the determinants of perceived quality of mobile-ticketing and its impact on the engagement of mobile users towards applications of companies in the tertiary sector.

Design/methodology/approach: an exploratory qualitative study is conducted among end-users of mobile-ticketing applications. Data includes 21 semi-structured interviews with end-users exclusively from service provider platforms.

Findings: this study delimits the determinants of perceived quality for a mobile-ticketing service and their role in the engagement building process towards the Application brand. It shows that engagement is conditioned by the quality of service and satisfaction in a mobile-ticketing context.

Originality: this article extends the theory on perceived service quality by integrating different determinants specific to mobile-ticketing. It is one of the first specialized researches in a mobile service domain and that studies a specific branch of mobile marketing, while the majority of studies address electronic service quality.

Keywords: perceived quality; mobile-ticketing; mobile users; mobile applications; engagement.

Résumé

Objectif : l'objectif de cette étude est d'examiner les déterminants de la qualité perçue du mobile-ticketing et son impact sur l'engagement des mobinautes envers les applications des entreprises du secteur tertiaire.

Méthodologie/approche: une étude qualitative exploratoire a été menée auprès des utilisateurs finaux d'applications de mobile-ticketing. Les données comprennent 21 entretiens semi-directifs avec des utilisateurs finaux exclusivement issus des plateformes de fournisseurs de services.

Résultats : cette étude identifie les déterminants de la qualité perçue d'un service de mobile-ticketing et leur rôle dans le processus de construction de l'engagement envers la marque de l'application. Elle montre que l'engagement est conditionné par la qualité du service et la satisfaction dans un contexte de mobile-ticketing.

Originalité : cet article étend la théorie sur la qualité de service perçue en intégrant différents déterminants spécifiques au mobile-ticketing. Il s'agit de l'une des premières recherches spécialisées dans un domaine de service mobile et qui étudie une branche spécifique du marketing mobile, alors que la majorité des études portent sur la qualité des services électroniques.

Mots-clés: qualité perçue; mobile-ticketing; utilisateurs de mobile; applications mobiles ; engagement.

1. INTRODUCTION:

The conversion of electronic services to mobile has become a strategic requirement for businesses who wish to adapt to new global trends. In January 2022, there were more than 5.48 billion mobile users worldwide, or about 68.4% of the total population (Digital Report 2022, published on wearesocial and Hootsuite) with a growth rate of3.5%, exceeding the global population growth rate of 0.84% (UN). During this same period, 73% of internet connections were made from a smartphone, and 91% of all internet users connected to the web from a smartphone. Mobile activities generated more than 120 billion dollars, representing an annual growth of 20% (wearesocial.com). These figures highlight the growing potential of the global mobile market.

Furthermore, the disruptions due to the global Covid-19 pandemic have made companies even more aware of the necessity to invest more in digitalization. At the same time, this health crisis has helped most wary customers overcome psychological barriers linked with digital use and made them aware of the value and benefits gained from digital tools.

Mobile-ticketing is increasingly prevalent in the service sector, given the reduced cost and effort compared to printing tickets. In India for example, mobile-ticketing helped save more than 15 million dollars on printing tickets (JP. Simon, 2020). In 2023, France is planning to eliminate the approximately 30 billion receipts and invoices printed each year (survey conducted by Twilio and Opinea in 2022) and replace them with digital tickets.

With the observed global migration towards mobile and since the majority of existing work focuses on traditional or electronic service quality, the study of mobile service quality is crucial to better understand this immersive world and guide companies in this technological development. We have chosen to address the following issue: how can the perceived quality of services influence engagement towards mobile ticketing applications of service companies? Therefore, it is necessary to understand the determinants of the perceived service quality considered important by mobile users and how service companies opting for mobile-ticketing can act on this quality in order to shape engagement towards their brand. To achieve this goal, we identify the following research questions:

QR1: What modifications does the mobile channel bring to the perception of service quality?

QR2: How can the company act on mobile users' engagement towards its brand through the perceived mobile-ticketing quality?

Academics and practitioners both agree that the level of perceived service quality is an imperative condition for the level of satisfaction (Galan and Sabadie, 2002; Y. Liebermann and S. Stashevsky, 2009; Oliver, 2014) and engagement (P. Hellier et al. 2003; S.S. Kang et al.

2004; J.T. Fragoso et I.L Spinoza, 2017) towards brands. In a digital and particularly mobile universe, building and maintaining a minimal level of service quality are even more complex (C. Lovelock and P. Patterson, 2015; J Xu et al. 2013; H. Bansal and S. Taylor, 2015) and present certain specificities (W. Wiwiek 2020; M. Aminiet al.2020).

This research aims to study the perceived mobile-ticketing quality by identifying its most significant components for mobile users. Through this study, we aspire to understand how the mobile user can develop a strong engagement with a service brand through the perceived service quality during the mobile sale of electronic tickets. Our interest in this research area has been previously exposed and justified by global statistics showing the potential of this distribution channel, considered as a new technological context for companies in the tertiary sector.

We structure our approach by commencing our work with an exposition of the fundamental concepts underpinning our investigation, as well as the delineation of the theoretical framework governing our research. This introduction is followed by a comprehensive presentation of our work methodology. Subsequently, we present and delve into the detailed discussion of the obtained results, before concluding with a critical analysis of the inherent limitations of our study and an exposition of future research possibilities.

2. LITERATURE REVIEW:

In today's digital age, mobile users tend to prefer "intelligent applications," buying and consuming through mobile devices. The service sector is also forced to adapt to this new trend. In fact, the creation of fully digital services such as 2.0 events has made it possible to create, sell, and even consume services via the internet. This leads to the importance of focusing on mobile-ticketing, which consists of selling service tickets through mobile devices, as it applies to all service providers.

2.1 Mobile-ticketing:

Self-service technologies (SST) have been defined as the set of means and technological interfaces that allow customers to create services without having to go through direct contact with staff (ML. Meuter et al. 2000). This revolutionary distribution channel changes the principles of services that have long relied on contact between customers and employees, which was once one of the main components of service quality (C. Lovelock and E. Gummesson 2004).

Parallel research has focused on customer satisfaction related to service delivery through technological channels. The dimensions identified for this sphere have been summarized by researchers including Meuter et al. (2000) as follows: ease of use, no contact with staff, time-

saving (Pujari 2004), temporal and special accessibility (M Jougleux 2006), minimizing hits, service production efficiency (JP. Galan, W. Sabadie 2001), and addressing key needs.

The definition of mobile-ticketing is the use of wireless devices to connect to the internet and purchase services (R. Rios and H. Riquelme, 2010). The difference between e-ticketing and mobile-ticketing is that the former requires a computer to connect to the internet, while mobile-ticketing uses wireless devices (H Karjaluoto et al., 2010). To achieve their mobile marketing goals, companies operating in the tertiary sector must rely on constantly updated technology solutions as well as the sustained behaviors of digital customers through the establishment of a high level of engagement (U. Di Stasoet al., 2013). Academics have recently added the concept of smart ticketing, which they define as the storage and sale of tickets on intelligent electronic interfaces such as Smartphones and chip cards (M Puhe, 2014).

In his study on the integration of online ticket sales in public transportation, (M. Mezghani, 2008) argues that the next step in technological advancement would be mobile-ticketing and the integration of its services into banking applications or even electronic wallets. The development of mobile technologies offers lucrative benefits to service providers (N. Iman, 2018). Kapoor et al., (2015) list five attributes of this new technology, which are utility, ubiquity, mobility, accessibility and stability.

Obviously, the benefits of this new mode of ticket sales do not just extend to companies, but also to the end consumer. It certainly improves convenience and eliminates risks associated with paper such as wear and tear or forgetting (A.Sulaiman, 2016). In addition, access to information on different services and offers is simplified, allowing customers to make optimal decisions without spatial, temporal and logistic constraints such as when using a computer. On the other hand, users, although aware of the usefulness of mobile-ticketing, remain skeptical about risks related to the disclosure of personal data, hacking risks and potential financial losses, which shapes their perception of quality of service. Finally, JP. Simon (2020) talks about the role of the mobile aspect in the development of the economy in general, especially in the service sector. He nonetheless draws attention to the need to popularize its use and understand its different mechanisms and implications.

Several studies of perceived service quality have shown the importance of trust, perceived pleasure and innovation (AA. Alalwan, 2018), cost reduction of transactions (V.L. Johnson, et al. 2018), perceived benefits (L. Gao and K.A. Waechter, 2017) and perceived risk by the customer (P.A. Pavlou, 2003). It is therefore appropriate to study the perceived qualityto measure the perception of mobile applications by mobile users compared to traditional websites.

2.2 Electronic service quality:

C. Lovelock and P. Patterson (2015) define electronic service quality as the perception of the degree of effectiveness and efficiency of a given website with regard to its products or services exposure, their marketing and their deliveries. This change is primarily characterized by a shift from a relationship-based evaluation to a transactional-based one. It also involves pre- and post-experience elements that are included in the evaluation of electronic service quality (J Xu et al. 2013). H. Bansal and S. Taylor (2015) join this same perspective by defining electronic service quality as the level of excellence of online services.

In this section, we will review the most common and redundant dimensions in works dealing with perceived electronic service quality. W. Wiwiek (2020) then lists 3 main dimensions of service quality impacting online satisfaction and loyalty: trust, personal life and efficiency. In their study on online retail, M. Aminiet al. (2020) present a reliable and valid conceptualization of service quality in this context, consisting of three dimensions of e-service quality: quality of processes, quality of results and recovery.

The perception of an online service quality is strongly influenced by the feeling during the shopping experience. L. Lahna (2021), inspired by works such as that of A. Charfi (2012) on immersion, aimed to identify 5 key dimensions of electronic shopping experience. These dimensions are 3D environment, control order, virtual agent, perceived utility and hedonism. This same study considered the location of visit, the time of visit and the internet tool expertise as non-significant components. G. Bressolles and F. Durrieu, in their research conducted in 2011 on the "NETQUAL" scale of e-commerce sites, borrow from previous studies, security quality/privacy and reliabilityas success factors, and also add design quality and the site usability.

To evaluate an online service quality, A. Parasuraman, et al. (2005) identify 11 dimensions involved in the perception of internet users. These dimensions are: accessibility, ease of navigation, trust, flexibility, efficiency, site ergonomics, privacy, offer customization, price, assistance and reliability. These 11 dimensions have been studied when developing a measurement scale for electronic service quality "E-S-Qual". S. Atarodi and A. Berardi (2019) list ease-of-use as the main factor in the quality of a website, to which they add security, design and processing speed. A study conducted in 2003 by S. Rolland, highlighted information availability on the site. Other research has focused on service quality, whether by studying its antecedents and consequences or by studying its dimensions.

After reviewing the theoretical foundations of perceived quality and mobile-ticketing, it is necessary to reconcile the two concepts in order to identify the most relevant dimensions in line

with the needs of our study. These dimensions are nine in total, seven as exogenous elements and two as moderating elements. The exogenous dimensions selected are: information, perceived usefulness, ease of use, hedonism, aesthetic and graphic interface, privacy of personal data and payment security. The moderating elements are: electronic word-of-mouth (E-WOM) and time savings. We choose, for our part and to serve the objective of our study, to combine between the NETQUAL and ESQUAL models.

We summarize the dimensions selected from the two models and the most recurrent in the literature in the following table:

TABLE I: **Summary of electronic service quality dimensions**

Dimensions	Authors	Variables
Perceived usefulness	-A. Parasuramanet al.(2005) -L Nguyen andO Chanut (2018) -G Bressolles and F Durrieu (2011) -S. Rolland (2003)	-Online service quality -Electronic service quality -NETQUAL -Perceived quality of a website
Time saving	- A. Parasuramanet al.(2005) -M Blutet al.(2015) -G Bressollesand F Durrieu (2011) - D.Amutha (2016)	-Online service quality -Electronic service quality -Perceived quality of internet banking -Perceived quality of a website
Ease of use	- L Nguyen andO Chanut (2018) -G Bressolles and F Durrieu (2011) -S. Rolland (2003) -S. Atarodi andAM Berardi (2019) - D.Amutha (2016)	-Electronic service quality -NETQUAL -Perceived quality of a website - Electronic service quality -Perceived quality of internet banking
Security	- L Nguyen andO Chanut (2018) -G Bressolles and F Durrieu (2011) - D.Amutha (2016)	- NETQUAL -Perceived quality of a website -Perceived quality of internet banking
Design and ergonomics	-G Bressolles and F Durrieu (2011) - M Blutet al.(2015) - D.Amutha (2016)	-NETQUAL -Electronic service quality -Perceived quality of internet banking
Hedonism	- A. Charfi, (2012) - C. Hamadi (2010)	-Online shopping -Perceived quality of internet banking
Information quality	- D.Amutha (2016) -S Atarodi andAM Berardi (2019) -S. Rolland (2003) -G Bressolles and F Durrieu (2011)	- Perceived quality of an online merchant -Electronic service quality -Perceived quality of a website -NETQUAL
EWOM	- A. Parasuramanet al.(2005) - D.Amutha (2016)	--Electronic service quality -Perceived quality of internet banking
Confidentiality	-G Bressolles and F Durrieu (2011) -D.Amutha (2016) -M Blutet al.(2015)	-NETQUAL -Perceived quality of internet banking -Electronic service quality

Source: authors

2.3 The link between perceived quality, satisfaction and engagement:

Defining the relationship between service quality and satisfaction will help identify the antecedent and the consequence in this linkage. I. Prim (1998) attempted to model this question by a figure that assumes a two-way relationship:

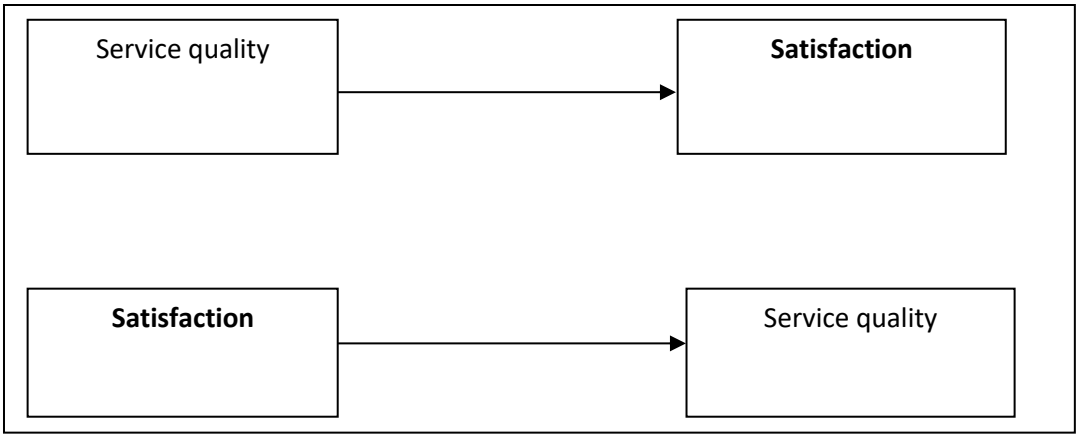


Figure 1: Causality relationship between satisfaction and service quality (Prim, 1998)

When addressing the examination of perceived quality, the academic community has taken note of the assertion from the prevailing school of thought that perceived quality should be regarded as a precursor to satisfaction (Mpinganjira, M., &Kaulungombe, B., 2019; Liu, Y., Li, H., & Hu, F., 2019). A highly significant nonrecursive model, developed by S. Kang et al. (2004), investigates this relationship and proposes that perceived quality has a substantial influence on satisfaction. This study is gaining increasing validity, particularly in the context of services rather than products (E. Leroux and PC. Pupion, 2009).

Many works in consumer behavior have shown the determining role of satisfaction and perceived quality regarding the establishment and development of customer engagement, especially for the intention of re-purchasing the same product or service. Indeed, A. Boyer and A. Nefzi (2008), in their work on purchase intentions, were able to justify the positive joint effect of perceived quality and satisfaction on the customer's intention, which becomes strongly and explicitly expressed. Works on perceived quality (L. Hadjouand J. Akkoul, 2020) define it as a main element of customer intentions. PV. Ngobo (2000) argues that consumers are not willing to bear additional costs or accept a higher price solely for the purpose of maintaining a relationship with a brand. However, the research conducted by N. Pandey et al. (2020) has demonstrated that, on the contrary, customers may be inclined to accept a price increase if certain conditions are met, including the company's level of performance, a high perception of quality, customer satisfaction, and a reasonable price increase. Y. He et al. (2008) emphasize that this price inelasticity signifies customer commitment.

2.4 Hypotheses:

H1: Perceived usefulness has a positive and significant effect on satisfaction.

H2: Ease of use has a positive and significant effect on satisfaction.

H3: Security has a positive and significant effect on satisfaction.

H4: Design and ergonomics has a positive and significant effect on satisfaction.

H5: Hedonism has a positive and significant effect on satisfaction.

H6: Information quality has a positive and significant effect on satisfaction.

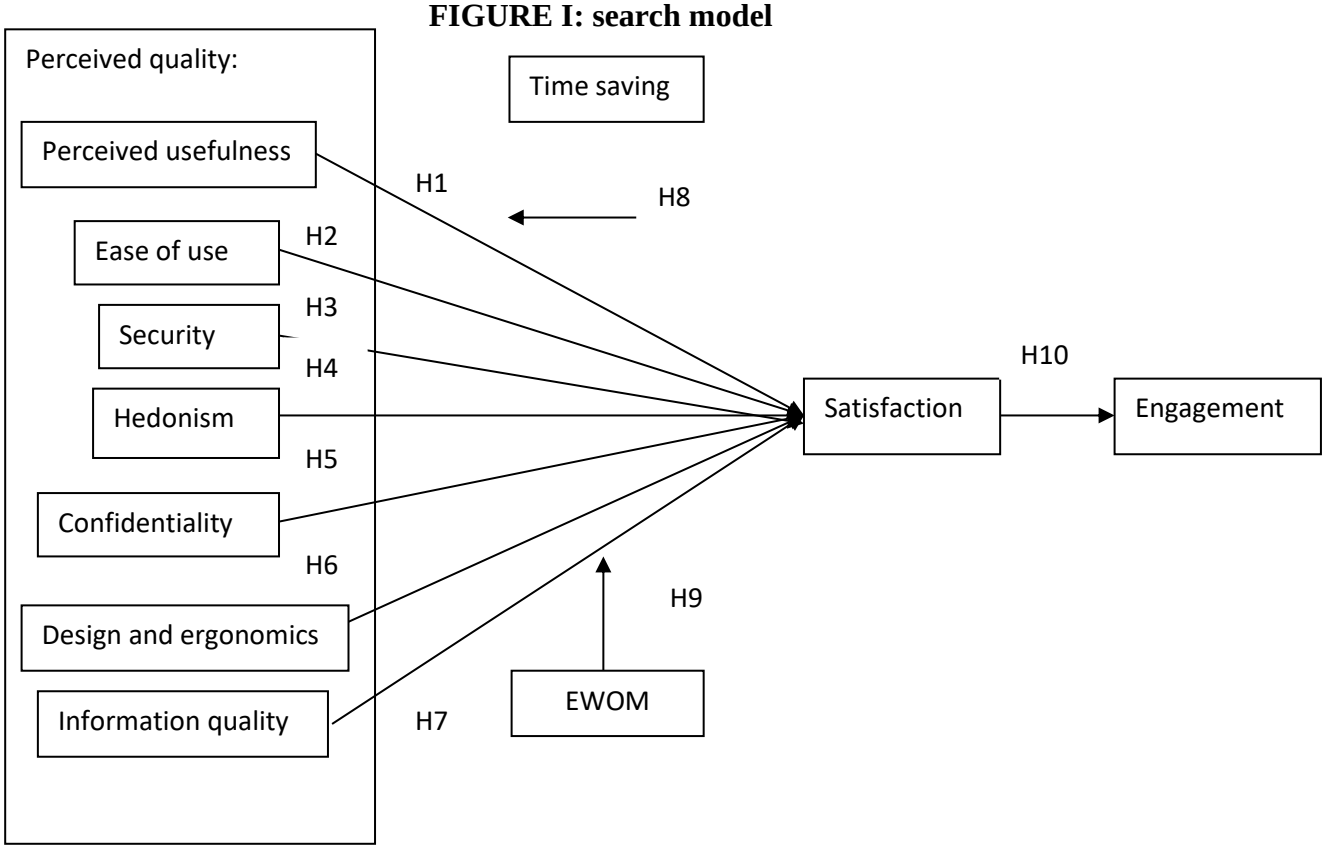
H7: Confidentiality has a positive and significant effect on satisfaction.

H8: Electronic word of mouth mediates the relationship between information quality and engagement.

H9: Time saving mediates the relationship between perceived usefulness and engagement.

H10: Satisfaction has a positive and significant effect on engagement.

FIGURE I: search model



3. METHODOLOGY:

The ultimate goal of qualitative studies is the understanding of psychological phenomena and latent variables. We conducted an exploratory qualitative study among end users of mobile-ticketing applications. The study was guided by the deductive research methodology (J.

Marchand and C. Giroux, 2010) based on developing hypotheses founded on existing theory. To collect data, we conducted semi-directive individual interviews since they offer multiple advantages that best serve the research objectives. The technique of semi-directive individual interviews does not claim to quantify the problem and instead helps to identify the motivations of a particular behavior that cannot be fully apprehended by quantitative methods (H. Fenneteau, 2015).

Most ticket sales services are now offered through online platforms, especially applications, thanks to the astounding use of mobile devices. Thus, applications are increasingly integrated into the customer's experience, which also allows users to reflect on the quality of these mobile services. In addition, the scientific community notes a need for more research on this type of intelligent service, particularly with relation to how customers experience and perceive it (J. Gummeruset al., 2019; NV. Wünderlichet al., 2015; L. Gonçalves et al., 2020).

3.1 Data collection:

Our data collection method relied on semi-structured interview guides due to their flexibility in collecting information. Additionally, it has been proven (Euréval, 2010) that in terms of qualitative procedure, this method outperforms in adaptability compared to other methods developed for the same purpose. On one hand, we evaluated the appropriateness of the focus group to the objectives of our study, which revealed limitations such as the leader syndrome, the desire for belonging and acceptance syndrome, and the social conformity syndrome (H. Fenneteau, 2015; Evrard 1997; A Giamiset al. 1995...). This technique has the greatest number of identified biases. On the other hand, non-directive interviewing presents less bias but remains limited in terms of the richness of information due to the principle of accepting the discourse as it is.

At this stage of the qualitative study of our article, the sample interviewed is exclusively composed of end-users of mobile-ticketing applications since we are interested in their perception of mobile-ticketing service quality. Initially, we adopted the principle of semantic saturation to determine the number of conversations to be carried out (V. Kosaet al., 2017). Twenty-one semi-structured individual interviews were conducted and our sample was composed of different age groups and socio-professional categories. The sampling was conducted according to a clear and sufficient criterion which is the use of mobile-ticketing applications, allowing the achievement of the collection objectives. N. Bennette and G.J. Lemoine (2014) state that in marketing, a qualitative study established between 12 and 15 interviews is considered as a research of good quality. Moreover, all interviews were conducted face-to-face, lasted between 40 to 50 minutes with the mobile users mainly in public places. All

discussions were recorded, and the transcription of the integral speeches was done taking into account the normative conditions of transcription developed by M. Laforest (2011).

3.2 Data analysis

The first point to raise in terms of collecting qualitative data is the limited number of observations but yet rich in illustrative information. Based on the results of the literature review, we were able to develop a conversational guide in four steps, an introductory phase that includes general questions such as simplifying the main concepts of our study and to establish trust between us and our interlocutors in order to eliminate any potential biases. This is followed by the centering phase which allows the public to express themselves more on the main aspects of our central concepts such as mobile-ticketing, service quality, engagement and more.

Secondly, we chose to apply a manual treatment of qualitative data as defended by the artisanal school. Among the significant works on this subject may be the one directed in 2013 by Canadian researchers N. Roy and R. Garonand who do not automatically link the success of a project to the use of qualitative data processing software. They add that in the context of a medium-sized project, the treatment of qualitative data can indeed be done manually. This is the case for our study which was conducted on a sample not exceeding twenty-one people. We therefore made our methodological choice to adopt the artisanal approach.

Indeed, the process of content analysis aims to present the interviews and results in the most objective way possible. Our approach followed the order that begins with the development of corpora, the recording of oral passages and finally the analysis of expressions and their meanings proposed and validated by L. Bardin in 2003. We then moved on to thematic analysis according to the vision of J.L. Giannelloni and E. Vernette (2001), which divides it into two phases of analysis, namely vertical and horizontal. The first phase allows understanding the scheme according to which the investigators analyzed each component of the analysis grid (JL. Giamelloni and E. Vernette, 2001). In our case, it is used to understand the mechanisms that play a role in the development of satisfaction and engagement of mobile users in the context of mobile ticketing as well as the determinants of positive perception of mobile ticketing services. Furthermore, the horizontal analysis of interviews leads to the identification of regular data specific to the whole sample, which will be considered as constants allowing a better understanding of the perception process (L. Bardin, 2003).

4. FINDINGS:

The presentation of the results will primarily be based on the following typology of elements. Firstly, the exogenous elements that have been identified from the literature review. Secondly, the elements that moderate the relationship between the exogenous elements and satisfaction, which represents our mediator and third element. Finally, we will proceed to the results related to the endogenous element, namely engagement.

As detailed and explained previously and in accordance with the principle of semantic saturation that we have chosen to adopt, 21 interviews were conducted and transformed into a corpus among mobile users of all socio-professional categories and ages combined, and who have at least once bought a ticket through a mobile application.

TABLE II: Summary of sample's profiles

Characteristic	Modalities	Number	Percentage
Age	18 – 30	9	60%
	31 – 45	5	33%
	46 – 60	1	7%
	+60	0	0%
Gender	M	4	27%
	F	11	73%
Education level	High school to Bachelor	6	40%
	Master	7	47%
	MBA/PhD	2	13%
Access locations	Work	2	13%
	Home	1	7%
	Public places (cafes, hotels, universities)	13	80%

Source: authors

The horizontal analysis allowed the determination of the main components according to mobile users for perceived quality, satisfaction and engagement with mobile-ticketing applications. We present all of these elements in the following table:

TABLE III: horizontal analysis

Themes	Number of citations	Citation frequency
Information	317	100%
E-WOM	179	86%
Perceived usefulness	319	100%
Time saving	142	93%
Ease of use	109	100%
Hedonism	347	100%
Use of IDAs	206	100%
Aesthetic	204	100%
Confidentiality of personal data	15	30%
Payment Security	155	100%
Satisfaction	146	100%
Engagement	148	100%

Source: authors

4.1 Results interpretation:

Information: This dimension was cited more than 201 times in total, therefore it holds one of the highest frequencies and was noted by all respondents. At first, users judge the quality of the information through statements such as "It is useful information," and then the amount of information by saying, for example, "not too much information and not too little." Mobile users also judge electronic word-of-mouth, which is full of real information according to mobile users.

E-word-of-mouth: Electronic word-of-mouth is a moderating variable between information and satisfaction that is of paramount significance due to the frequency of citation. This variable is essential due to positive statements such as "I rely heavily on reviews, comments and experiences" and the ability to avoid similar problems. A second aspect highlights the ability to leave evaluations through expressions such as "it allows me to express myself" or "I can give my opinion." Finally, the e-reputation through statements such as "it allows me to have an idea of the reputation." These statements emphasize the importance of being able to access the reviews, comments and ratings of other users.

Perceived utility: This dimension was cited in an aggregate manner and ranks second in terms of citation frequency by all respondents, hence the perception of these applications as being useful and adding value for users is highly significant. Observed verbatim are "my

application is very useful" and "the added value of my application." In order to judge the usefulness of these mobile applications, internet users express the ability to reduce the risks associated with ticket purchasing operations through statements such as "it prevents me from getting scammed." Mobile users also judge perceived utility through the time-efficiency component. Time savings, which is a moderating element, was emphasized through statements such as "The main advantage of these applications is time savings."

Time savings: This element that modulates the relationship between satisfaction and perceived utility is significant because it was mentioned 142 times by 93% of the interviewees. Indeed, general statements were collected such as "my app saves me time" or "my app saves me a lot of time and energy" and others more specific to the features of mobile applications, for example "my app is much faster to access" and refers to the first component, namely the speed of access. The second component is the speed of transactions. Therefore, particular attention should be paid to this variable.

Aesthetics: This is a dimension of utmost importance since it was mentioned 193 times with a rate of 100% of respondents having mentioned this element. Firstly, mobile users judge the overall aesthetic aspect of the application. Then the aesthetic dimension is judged according to three aspects: the first is the interface, followed by the graphic charter and finally the sound effect which will be removed during the empirical study despite the fact that it is mentioned by 60% of respondents due to the negative dissonance found through the respondents' statements summarized mainly by "I find the sound effects often annoying".

Data privacy: This variable was cited such as "The analysis of my preferences allows me to have personalized proposals" or "I'm willing to share my email address and phone number to receive offers compatible with my searches," hence the need to deduce that the preferences of internet users are constantly changing. We note that mobile consumers are beginning to perceive the analysis of their data as an advantage that allows them to compare prices, designs, offers and to receive personalized proposals. However, they are still wary of personal banking data, which we choose to integrate as payment security items and not as a separate dimension and this, based on the literature review and the statements of our qualitative sample.

Payment security: This variable is mentioned 155 times by 100% of respondents, which shows its high significance for our mobile user target. Indeed, the responses of our target indicate that payment security on mobile applications is a key element that we must maintain for users of applications that commercialize tickets via mobile. Respondents

express their security needs in phrases such as "The security of my payment transactions is the most important thing to me" or "The payment system must be infallible," which leads us to conclude that mobile buyers do not allow any margin of error for applications regarding payment security. The second component is the sense of security.

Hedonism: Cited by all interviewees, 257 times, it is clear that this dimension plays a crucial role for the respondents. The surveyed users focus on the playful aspect of mobile apps for online ticket sales and believe that hedonism in these apps is conveyed in the following way. First, the experience through statements such as "I had fun experiences" and "living a beautiful experience." Secondly, the use of new sales aids: this dimension was neglected in our literature review, which is full of works on this variable (M. Beck and D. Crié, 2015; J. F. Notebaert, 2019). Indeed, the use of these new technologies was mentioned by the interviewees who say for example "Technologies like 360-degree videos, augmented reality technologies, geolocation etc. make apps more enjoyable" and "Technologies that make my navigation better." This component was cited 166 times by all interviewees, but without using technical words such as IAD, except by one person who is an expert in the field. It is composed of two dimensions, virtual fitting and simulation of future experiences.

Ease of use: "What can encourage me to use an app and be satisfied with it is that the navigation is simplified." This dimension was generally cited 96 times by all respondents. Subsequently, it embodies a significant interest for the participants of this study. The last exogenous element of our model mainly covers two of the most important sub-dimensions among others, namely: convenience by directly associating it with ease of use through statements like "I want it to be an easy and convenient app." The interviewees repeatedly draw attention to the importance of facilitating access and connection to these apps in order to maximize the perception of convenience.

Satisfaction: Satisfaction with mobile-ticketing is indeed confirmed as a mediating element between the previously cited exogenous components and the endogenous element, namely engagement. Indeed, the responses of our target imply that internet users tend to be satisfied with the apps that sell online tickets when these apps provide a quality service, before showing engagement towards the app or the brand that issued it. This element materializes through a measure of overall satisfaction in this way: "Overall, I am satisfied because generally, everything goes well, with some limitations." It also goes through the repetition of navigation on the app or the act of buying "When everything goes well and I am clearly satisfied, I am ready to come back to the app." Finally, this attitude is also manifested through affective attachment to the brand "I like this app, I love my app."

Engagement: The behavioral dimension of engagement is cited by everyone interviewed. It is then confirmed as being the resulting element of perceived quality and satisfaction. All interviewees feel engaged with the brand of the app itself and not with the brands or service providers. Indeed, for mobile apps that offer multiple providers for the same service, such as the giants of OTA (Online Travel Agencies) like Tripadvisor or Trivago, users generally feel engaged with the app's brand. They say "I feel engaged with my app and the virtual community I am a part of," think of using their apps first everywhere and for all searches "When I need to buy a ticket, I always start with my app before looking elsewhere," and don't plan to change apps in the future "I will always use this app. Why change when I never had a problem with them." Finally, the interviewees judge their engagement with the app through word-of-mouth engagement "I share my app with my entourage."

4.2 Discussion:

After conducting a horizontal thematic analysis of the answers from our main target, namely mobile ticket sales application users, we come out with several findings. Firstly, the exogenous dimension "protection of personal data" was dismissed by the majority of those interviewed and was strongly disputed by them. It was embedded in the dimension of payment security. One of the sub-dimensions of aesthetics was removed, namely the sound effect, due to the formulation of negative or indifferent related citations. The use of new sales aids appeared as a new moderating dimension between hedonism and satisfaction, due to the high number of citations by the respondents and their confirmation of the pleasure felt when using one of these new sales technology aids. Finally, engagement with the brand will be replaced by engagement with the application, in line with the statements of the respondents regarding their engagement, which they said develops towards the application itself and not towards the service provider's brand in the case of applications offering multiple tickets, services and providers.

On the other hand, the vertical analysis allowed us to make a ranking based on the frequency of citation of each dimension. This classification will help us better understand the importance of each dimension in the users' minds. We represent them with their respective order of importance (1 being the most important and 11 the less important) and a definition inspired by the verbatim of our respondents.

TABLE IV: vertical analysis

Themes	Rank	Contextual Definition
Information	11	Information is expressed in our context by electronic word-of-mouth (comments, ratings, reviews... from other users) and by the quantity and quality of the content and information offered..
E-WOM	3	It refers to the possibility of consulting the opinions of other users and being able to share one's own judgment.
Perceived usefulness	1	Perceived usefulness refers to the added value that our target perceives from this application
Time saving	5	The time saving is the first perceived usefulness conferred by mobile-ticketing to its users
Ease of use	9	Ease of use is embodied here in the convenience of use and the practicality of the application and then in the degree of control felt by the user during navigation
Hedonism	8	In our context, it mainly goes through the use of IDAs technologies and then by the projective power of the application towards the desired experience
Use of IDAs	2	It is the ability of an application to stimulate the sensory side of the internet user through new technologies (augmented reality, geolocation, simulator...)
Aesthetics	10	For our target, the aesthetic side of the application is mainly expressed by the interface (font, colors, shapes...)
Payment security	4	Refers to the security of transactions and accounts on mobile-ticketing applications
Satisfaction	7	Satisfaction plays the role of a springboard between all the features and functionalities offered by the application and between the predisposition of M-consumers to engage with the application
Engagement	6	Engagement in our context and according to our target is a shifting from brand engagement to an engagement towards the application itself

Source: authors

5. CONTRIBUTION AND IMPLICATIONS

To conclude, it is important to present the main contributions of this article, its different limitations and finally the opportunities for future development.

5.1 Research contributions:

Theoretical contributions: From a theoretical point of view, the results obtained predict that the mobilization of variables acting on the perception of service quality in a "self-service mobile" context transforms the very nature of the elements on which mobile users rely to develop engagement towards a ticketing application. Thus, through the outcomes of this research, we demonstrate the dimensions of MTQUAL (mobile-ticketing quality) for service companies. These are essentially and in order of priority for the user: perceived utility, payment security, hedonism, ease of use, aesthetics, and finally information. We complement our theoretical contribution by examining the moderation role of Use of IDAs and time saving, and also the mediating role of satisfaction. Indeed, we started by studying the impact of the dimensions of perceived mobile quality on satisfaction, then the influence of satisfaction on engagement. Finally, for the first time in this field, we were able to study the causal approach of mobile service quality - satisfaction- engagement.

Methodological Contributions: From a methodological perspective, this work makes major contributions, such as the creation of a mobile-ticketing service quality evaluation base, which is essential for both researchers interested in services and for business managers. This study examined several dimensions and their components that have not been widely used for mobile services and mobile-ticketing. The study then looked at the behavior of mobile users, their new consumption and evaluation modes. This qualitative method allowed for the collection of a wealth of information in order to understand the changes associated with the use of mobile devices. This work has the merit of clearly delimiting the engagement in this specific field, which involves the intervention of multiple actors. Engagement is often developed towards the issuer brand of the application, even if the service provider's brand is explicit. Another methodological contribution is to understand the implications of satisfaction and engagement towards mobile-ticketing applications, allowing for some comparison between electronic and mobile services.

Managerial Contributions: The results of our work provide answers to support tertiary sector managers in handling the perceived quality of service provided by their mobile applications. The mobile user bases their perception of mobile-ticketing quality on dimensions that are specific to them and develops a strong engagement in this sense. Therefore, we conducted a study on the determinants of the perceived quality of mobile-ticketing applications. The aim is

to provide business service managers with a toolbox to help them manage the launch, use and evaluation of their applications by mobile consumers. This research will allow to manage the antecedents of satisfaction towards mobile-ticketing applications and engagement towards the services provided by these new channels as a means of proximity with mobile users.

The study of specific engagement measurement elements in a mobile-ticketing context allowed us to understand, first of all, that it is about the willingness of Internet users to engage with mobile-ticketing applications in any way (install, recommend, repeat purchase...). As for the antecedents of this dimension, they represent a multi-stop causal path that must be mastered by practitioners who seek to improve their mobile presence.

Regardless of how significant the results of such research are, it is only wise to recognize its limits and to examine possibilities for improvement or future development.

5.2 Research Limits:

In the context of our research work, we operated in two different contexts, both theoretical (mobile-ticketing) and empirical (companies operating in the service sectors, mainly accommodation, catering, transportation and OTA). At this level, we remain aware that the two remain quite limited in relation to the scope of the problem.

The development and rise of new mobile technologies, distribution channels, new sales support tools as well as security technologies, management practices, behavior of ticketing giants (Google flights, Tripadvisor, Trivago, Booking...), behavior of internet users, and everything that could follow, is likely to gradually or quickly make the results obtained during this research work obsolete.

In terms of data processing, we made the conscious choice of manual processing of qualitative data for better rigor in understanding and interpretation. However, in the next studies, we may opt for software processing to get more indicators such as the standard deviation of distribution within the semantic cloud.

5.3 Future research perspectives:

Indeed, it would be interesting to verify the validity of our results in different or broader contexts. Geographical extension, sectorial contextualization (for example telecommunications or banking services) or even a particular pricing mode such as yield management. Similarly, in terms of conceptual framework, it would be interesting to include several other applications from different categories, and not just ticket sales.

It would also be wise to focus future research on the environmental impact that mobile-ticketing usage can have on reducing the consumption of rare resources such as paper by limiting printed tickets. This advantage could be studied as a perceived utility item by mobile users.

Another research perspective is to examine the possibility of incorporating other variables into our evaluations, so as to enrich the overall significance of our findings. For example, moderating variables related to the characteristics of the population studied, such as age, gender, duration of use of mobile devices or previous experience with live applications. Furthermore, it would be useful to examine other antecedents of satisfaction related not only to mobile-ticketing, but to mobile applications in general.

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