Analysis of Moroccan net user resistance to mobile’s ticketing adoption: 
technological acceptance model application  
HATHOUT¹, S. CHAKRA², R. CHAREF³, F.

1. PhD student, IBN TOFAIL University, Morocco. Sagha.hathout@gmail.com  
2. PhD student, IBN TOFAIL University, Morocco. chakra.raja714@gmail.com  
3. University professor, IBN TOFAIL University, Morocco. facharef@gmail.com

**Summary:**

The development of subscriptions to mobile devices, in particular phones (more than 8.2 billion subscriptions in 2018: stats.areppim.com), as well as the enormous gains made by some companies through their mobile ticketing activity such as TRIPADVISOR that achieved a turnover more than 1,560 million USD in 2019 (source: TRIPADVISOR official website), represent the importance of this activity as a strategic choice for service companies.

How then to develop a reliable measurement scale of the acceptance of mobile ticketing, considered as an innovation of use, by the Moroccan user? And what are the dimensions helping to build a positive attitude and the development of use intention of these applications?

On the basis of an empirical study and a quantitative exploratory and confirmatory one, the results of this study are the development of a verified set of constructs suitable to the use in different measurement instruments and in the evaluation of several theoretical models. Also a reliable measurement scale of mobile ticketing acceptance to be applied in different contexts.

**Key words:** Technological acceptance model ; mobile ticketing ; Moroccan mobile users ; mobile applications.
La résistance de l’internaute marocain à l’adoption du mobile ticketing : une analyse par l’application d’un modèle d’acceptation technologique

Résumé :

Le développement des souscriptions aux appareils mobiles, en particulier les téléphones (plus de 8,2 billions de souscriptions en 2018 : stats.areppim.com), ainsi que les gains énormes réalisés par certaines entreprises uniquement à travers leur activité de mobile ticketing tel que TRIPADVISOR ayant réalisé un chiffre d’affaires de plus de 1 560 millions USD en 2019 (source : site officiel TRIPADVISOR), soulignent l’importance de cette activité comme choix stratégique pour les entreprises de services.

Comment élaborer donc une échelle de mesure fiable de l’acceptation du mobile ticketing par l’usager Marocain autant qu’innovation d’usage? Et quelles sont les dimensions en amant de la construction d’une attitude favorable et du développement de l’intention d’usage de ces applications?

Sur la base d’une étude empirique et une étude quantitative exploratoire et confirmatoire, les résultats de cette étude sont l’élaboration d’un ensemble de construits vérifiés adaptés à l’usage dans différents instruments de mesures et dans l’évaluation de plusieurs modèles théoriques. Aussi une échelle de mesure fiable de l’acceptation du mobile ticketing à appliquer dans différents contextes.

Mots-clés: Modèle d’acceptation technologique, mobile ticketing, mobile consommateur marocain, applications mobiles.
Introduction:

Today the digitalization’s potential in general and the progress based on the mobile aspect especially, does not cease gaining in importance and being essential as a strategic choice for the companies. Indeed in 2018 it was recorded more than 8.2 billion subscriptions for mobile phones, which represents more than 103, 4% of the world population (stats.areppim.com). The world wide penetration in 2019 reached 94% (stats.areppim.com). The average rate of development for this market is 6.6% for the same year and can reach up to 7,59% in 2025 according to certain forecasts which also stipulate that the subscriptions will exceed the 8.21 billion in 2030 (stats.areppim.com).

These predictions show the imposing potential of wireless telephone’s market at him only without taken into account the other apparatuses without wire which serve also the interests of the mobile-ticketing such as tablets and the digital Watch of which the use begins hardly its introduction to the world market.

Moreover current world pandemic circumstances of Covid 19 accelerated the awareness process about the importance of the digitalization more and more for a great number of companies. Also this pandemic could have broken certain psychological brakes at most of the consumers beforehand reticent towards the use of digital and currently conscious of its importance and the multiple advantages it proposes.

Through our work and considering mobile ticketing as a use innovation we aspire to identify the dimensions highly important in the spirit of the Moroccan consumer in order to accept it. We tempt through this study to understand how the mobile user can develop a positive attitude and a behavioural intention toward the mobile selling of the electronic tickets. As justified before by the statistics of the past years and the forecasts to come, this research’s field stimulates our interest because of the great potential which carries this new distribution channel for services sector.

1. Theoretical framework

Nowadays and in the era of the Web 4.0, M-surfers tend to privilege the “smart applications”, hence, the interest to speak about the mobile ticketing as an innovation of use and the technological acceptance.

1.1 Mobile ticketing

The definition of mobile-ticketing is simply the use of the wireless apparatuses to be connected to Internet (Riquelme and Rios, 2010). The development of mobile technologies provides lucrative benefits to service providers (iman, 2018). Kapoor and al., (2015) enumerate five attributes of this new technology that are usefulness, ubiquity, mobility, accessibility and stability. In order to achieve mobile-marketing’s goals, the companies operating in services sector must invest on technological solutions updated constantly as well as numerical customer durable behaviours.
through the establishment of a high rate of capture (Soave, 2013). The academics speak lately about the intelligent purchase of the tickets (smart ticketing) which they define as being the storage and the sale of the tickets on intelligent electronic interfaces such as Smart phones and the smart cards (Puhe, 2014).

It is clearly understood that the benefit of this new way of marketing the tickets is not exclusive at the firms but extends to the ultimate consumer. He surely gains in convenience and removes the risks related to paper like wear or the omission (Sulaiman, 2016). Moreover, the customer has access to more information on the offers available and can choose the most convenient choice whenever and wherever it suits him without being attached to a computer. On the other hand, the customers although conscious of mobile ticketing advantages, they still remain worried about the risks related to the disclosure of their personnel data, hacking risks and the possible financial losses. Hence, the necessity of applying the acceptance model (TAM) to the mobile ticketing. Indeed various studies of TAM showed the importance of trust, perceived enjoyment and innovativeness (Alalwan, 2018), reduction in the transaction costs (Johnson, and al., 2018), the perceived benefits (Gao and Waechter, 2017) and the risk perceived by the customer (Pavlou, 2003). It is appropriate to apply the TAM to the mobile ticketing in order to measure the acceptance of the smart applications compared to the traditional websites.

1.2 Technological acceptance model (TAM)

Although Davis developed the TAM in its first version in 1986, several adaptations to different mobile sectors where conducted. Bailey and al. (2017) used TAM to study the adoption of mobile payments by American customers. Chen and Mei (2017) in their study of mobile internet advertising acceptance have chosen to apply an extended form of TAM. Rahman and Sloan (2017) added perceived risk, perceived cost, and personal awareness to the other components of TAM to study mobile internet commerce in Bangladesh. The UTAUT unified theory off acceptance and uses technology which was developed by Venkatesh and al. (2003). Also, Dou and al. (2017) applied the TAM to the Chinese community of mobile internet users that leaded to take perceived ease of use, perceived usefulness, and interactivity in to account for the mobile internet adoption. Rafique and al. (2020) applied it to mobile library application and AM Mutahar and al. (2018) to mobile banking.

1.3 Application of the TAM to the E-trade and the mobile marketing

In order to legitimize the adoption of this model precisely to the detriment of the other theories related to technological advancement we will describe its application to two of the closest concepts from which rose the mobile ticketing namely E-trade and mobile marketing. This theory was adapted to the electronic trade environment in 2003 by the researcher Pavlou.
Finally in the same perspective to prove the legitimacy of our choice, we intend consequently to expose the technological acceptance model applied to mobile marketing (Bauer and al. 2005).

In their study the authors chose to sort dimensions to be studied according to two criterions. The first gathers dimensions related to the consumer himself which are knowledge and attitude toward new technologies and that are determining with regard to the positive attitude towards mobile marketing. The second group is related to technology and it gathers: perceived utility, the perceived risk, hedonism, and information. The test of this dimensions showed that the four of them are influent regarding acceptance of Mobile marketing. The social standards were identified like determinant variable towards the attitude and not towards the intention directly.

We choose for our part and to serve the purpose of our study, to combine between the model adapted to the electronic trade and the one adapted to mobile marketing that will be extended thanks to other dimensions, considering them disciplines from which the mobile ticketing rises and because of the proximity of the fields. Dimensions selected then are:

### 1.3.1 Ease of use

This dimension has been the subject of several studies, and various definitions were collected in different contexts. Bressolles and Durrieu (2011) define the ease of use on the “World Wide Web” as the Net user’s perception of the simplicity to surf on a website. In a distribution context Rolland and Wallet-wadka (2003) speak about the effectiveness of the technology. In a context of online services Hamadi (2010) defines the ease of use as being the degree of simplicity of a site so the
customers can handle the interfaces by themselves. Rolland and Wallet-Wadka (2003) speak about adopting customer reasoning about the mode of using the interface. For C. Hamadi, (2010) the most important attribute is the technical performance degree. For this dimension we choose to adapt the scale developed by Suh and Hun (2002) made of 4 items namely: “I find my application easy to use”, “It is easy to remember how to use my application”, “It is easy to obtain what I want” and “It is easy for me to learn how to use my application”, “My application facilitates my life”, “It is easier to make choices on my application”.

H1: Ease of use impact positively the attitude towards the mobile ticketing.

1.3.2 The hedonism of self-service technologies

Boulaire and Mathieu (2000) define the hedonism as being the degree of pleasure felt by the navigators while surfing on a technological interface. This same definition was taken again by several other researchers adapting it to various fields of study. As an example, (Da Rosa and al. 2016) define it as “the capacity of the interface to generate pleasure and fun” by applying it to distribution field. Hamadi (2010) adapts the definition of this dimension to online banking.

The hedonic aspect of self-service technologies has known different naming such as entertainment (Zhang and Mao, 2008); enjoyment (Park and al., 2014); fun (Bruner II and Kumar 2005); and playfulness (Fang and al., 2005). It was proven that a favourable attitude is strongly correlated to navigation experience (Szymanski and Hise, 2000). We adopted Lacoeuilhe and al. (2017) composed of: “I use this brand because it is attracting”, “This brand gets me comfort and emotional safety”, “to have this brand is a source of pleasure to me” and “I am always very happy to have this brand”, “On my application you live an amusing experience”, “I find my application very pleasant thanks to new technologies”.

H2: The hedonism impact positively the attitude towards the mobile ticketing.

1.3.3 Esthetics and graphical user interface (GUI)

Srinivasan and Al. (2002) define aesthetics as being the diversity of the media component shown by the insertion of certain factors such as the logo, slogan, font and graphical interface. This atmosphere was also studied by Yoo and Donthu (2001) also Galan and sabadie (2001) to be directly related to the visual and sound part. Also, in the market of great distribution Galan and Makas (2000) posit that the aesthetic of a website can be considered as a competitive edge. Finally, Hamadi (2010) applied this dimension to the sector of e-banking, summarized in all media factors of a website able to make the navigation experience very much pleasant for consumers. In this stage we adjust the net-Qual scale presented by Bressolles and Durrieu (2011): “My application is visually attractive”, “the design of my application is innovative”, “my application is visually attractive” and “this application is pretty”, “My application clearly presents its graphic charter”.

H3: Aesthetics impacts positively the attitude towards the mobile ticketing.
1.3.4 Trust

Trust always knew a passion on behalf of the academic community, in particular through researches related to brands (Chaudhuri and Holbrook, 2001; Gurviez and Korchia, 2002) or through work on trust in the context of services (Sirdeshmukh, Singh and Sabol, 2002). It is recommended to focus on trust in the very early stages of the relationships with the customers to encourage continuous using of services (Slade and al., 2015; Ghafoor and al. 2018).

In the digital environment, Chouk and Perrien 2003 define trust in an electronic website as “consumer’s expectation that the online trader will not take advantage of its vulnerability and that he will honour his promises on the website”. Chong (2013) studied trust in a particular mobile environment and deduced that perceived risks tend to be higher. According to Galan and Sabadie (2001) trust depends on three elements: “The safety of the payments: all in all, I rely on the safety of the application”; “Personal data confidentiality: I trust this site not to misuse my personal information”; “Credibility of information: I obtain exactly the service I ordered”, “My application inspires trust”, “I trust the information available on my application”.

H4: trust impact positively the attitude towards the mobile ticketing.

1.3.5 Perceived utility

This dimension knew relevant definitions such as the one presented by C. Hamadi (2010) and which is specific to Internet banking. It stipulates that the perceived utility is the user’s conviction for a website that its technology allows more speed and effectiveness to carry out operations. In 2002 it was shown by Suh and Han that consumer’s attitude towards a given technology strongly depends on their perception of its utility and especially in the field of self-service. Indeed Ruona, Leimback, Holton & Bates, (2002) studied the impact of perceived utility of a task on developing using intention.

Also, Vansteenkiste and al. (2006) speaks about the existence of a relation between the task and its objectives in the future and that’s what builds a strong utility perception. Herault (2010) crated a scale composed of the following Items: “I think that this application can save me time”, “I think that this application enables me to save money”, “I think that this application brings useful information” and “I think that this application brings me a diverting experience”, “My application reduces the risks related to the purchase”.

H5: perceived utility impact positively the attitude towards the mobile ticketing.

1.3.6 Information

Rolland (2003) defines the information quality and quantity available for the mobile surfers as “the degree with which Web site makes it possible to be informed on the characteristics and the prices of the products or services in a precise and exhaustive way, by making it possible to carry out comparisons”. This same definition was adapted again in 2014 by Gao and Bai within his study on m-services. The impact of information on the perception of the utility comes from its
characteristics such as relevance, adequacy, precision and timeliness (Chatterjee and al., 2018; Veeramootoo and al., 2018). For its part the most important impact of information is the one it got on net surfer’s provision to use an interface and to reiterate their visit or their purchases on the website (Kim and Lim 2011).

Akter and al. (2013) supported this idea by exposing the impact of information on user’s attitude towards technologies. Finally, Hamadi (2010) developed a scale that suites our objectives: “Information corresponds to what I need”, “the application meets my needs for information”, “Information on this application is easy to understand” and “Information on this application is relevant”, “My application gives me access to the opinions of other consumers”, “application proposes the adequate quantity of information”.

H6: information positively impacts the attitude towards the mobile ticketing.

1.3.7 The attitude

Bathelot (2015) advances that “the attitude can be defined as all elements of personnel evaluation available to the customers regard a brand, product or service”. This dimension was studied in different contexts in order to raise its antecedents such as the impact of emotions on the brand’s attitude (V. De Barnier, 2002), the colours on a publicity’s attitude (MC. Lichtlé, 2002) and the perceived utility on discount’s attitude (C. Gonzalez and M.Korchia, 2008). We find in the middle of this analysis the combination of an arsenal of beliefs and elements.

Finally, F. Michelik (2008) conducted a study summarising the most important researches on the relation between the attitude and the intention of behaviours. Allagui and Temessek and. (2013) propose to evaluate this dimension through the following adapted items: “All in all, I like to use the applications of mobile ticketing”, “this application leaves me a pleasant impression”, “I feel that this application is very useful for me” and “I prefer to buy my tickets through applications downloaded on my phone”.

H7: the attitude impacts positively the intention of use towards the applications of ticketing

1.3.8 Use intention

Technological acceptance of mobile ticketing applications is a multidimensional concept, represented by intention to purchase tickets and intention to use the applications. Our model is inspired initially by the theory of the reasoned action, by the technologies acceptance model (TAM) and aligns itself with a number of other researches inspired by these models (Jellassi and Herault, 2015; Abdelkefi and Ben Brahim, 2015). We base ourselves on the explanation provided by Bauer and al. (2005) which conceders the resort to the mobile channels as being an innovation of use and represents a particular case for the application of the TAM.

We adapted the scale of Bauer and al. (2005) to mobile applications: “I intend to download this application on my mobile phone”, “I intend to surf on this application by using my mobile device”, “I intend to use this application in order to seek useful information concerning the tickets” and
"I intend to buy an electronic ticket on this mobile application", "I intend to create an account on this application".

Fig. 3: research model:

![Research Model Diagram]

2. Methodology

The objective of this paper is to study the acceptance of mobile ticketing applications as being an innovation of use and its impact on the attitude of the users and their intention of use, in particular for the service firms.

This consists in a quantitative study that shows that the nature of the empirical data we collected, measured by multi-item scales, dictated a certain adapted statistical procedure. Indeed, the quantitative approach, best suited to our work, is divided into two major parts: a first exploratory part followed by a confirmatory one supported by the use of structural equation modeling. Psychometric scales are frequently included in surveys in management studies, especially in marketing, as they are the object of a collection of most available scales (Bearden and Netemeyer, 1999).

<table>
<thead>
<tr>
<th>Stages</th>
<th>Used techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specifying the domain of the construct</td>
<td>Literature review</td>
</tr>
<tr>
<td>Generating a sample of items</td>
<td>Literature review</td>
</tr>
<tr>
<td>Collecting the data</td>
<td>Survey administered to 401 users of M-ticketing applications (of which 323 were usable)</td>
</tr>
<tr>
<td>Purification of the measurement instrument</td>
<td>Skewness test+ kurtosis test+ exploratory factor analysis+ cronbach's alpha</td>
</tr>
<tr>
<td>Estimating reliability</td>
<td>AFC+ cronbach's coefficient+ Joreskog's rho coefficient</td>
</tr>
<tr>
<td>Estimating validity</td>
<td>Rho of convergent validity+ student's T (convergent validity) + Fornell and Larcker approach (discriminated validity)</td>
</tr>
</tbody>
</table>

Table 1: Schematic adaptation of Churchill's paradigm (1979)

The necessity of exploiting the data bases customers of this type of companies. Recognizing the multiplicity and heterogeneity of these establishments, and not to limit ourselves to a type or a particular sector and also to avoid skews of selection, we turned to the platforms of online reservation and notation dedicated to this type of companies, in particular that specialized in air...
transport, lodging and restoration that are sectors which generate the most sales in both numbers and values regards mobile ticketing sales.

Our study was based primarily but not exclusively on the giants of the sector of OTAs (Online Travel Agency) as well as the users of the mobile applications developed by the service firms such as “ONCF” and “RAM” or the applications specialized in a field of precise service like land transport as example “OMIO” and “Markoubi”.

In order to verify the hypotheses of our model, we have chosen to use exploratory factor analysis (EFA), confirmatory factor analysis (CFA), reliability testing and validity testing as methods of data processing. For this purpose, a quantitative survey was conducted through the design and the administration of a survey to a competent sample.

2.1 Data collection and analysis

Considering the heterogeneity of these services users profiles, we decided to partially respect this contrast by applying Moroccan’s population sex ration to our sample. The selection method of the profiles is explained just afterwards. Logically, and since the nature even of our problematic is digital, the first criterion of illegibility is quite simply the fact of being Internet user.

Here, and since one is interested in the mobile context of Internet the second criterion is the fact of using a wireless devise. In the end, and because of our research context specific to the mobile tickets concerning the sector of services, it should be obvious that the last criterion is being confronted to the use of an application of mobile ticketing at least once. With this intention, it was necessary that our sample target belongs to at least one of the applications exciting cyber communities.

2.1.1 The sample size

In the academic word, there are two main trends in sampling, the probabilistic methods based on the chance, randomness or luck but able to produce credible estimates, information about sampling error and make inferences about the population (Canada Statistics, 2016). The second one is non-probabilistic method or (Empirical methods) conditioned by the nature of our population. Randomization here therefore applies to the composition of the population as opposed to probability sampling which adopts it in the process of selecting individuals who each have a chance of being chosen. Indeed, this non-probabilistic approach is more suitable to social sciences from the perspective of collecting descriptive data about the samples themselves. They have advantages such as time saving, cost reduction and efficiency.

Our choice of sampling was dictated by circumstances, because as has been pointed out we were unable to access the initially promised database of a Moroccan OTA’s users. This constraint made probabilistic sampling impossible. We then deemed it appropriate to extend our entire field of study to the other most well-known and most used mobile ticketing applications, and to proceed by the empirical method to define and identify our respondents.
At the same time, we opted for the fusion of three forms of sampling. The first was convenience sampling, which led directly and deliberately to snowball sampling, coupled with the principle of quota sampling. The adoption of this method was dictated primarily by the constraints of the field as well as by our desire to ensure that the biases associated with the empirical sampling method were minimized.

Convenience sampling: applied on an involved population, larger or smaller than the actual and final group, this method is interesting because of the conveniences it offers such as accessibility to a larger number and cost, while situating the respondents in relation to the target population. Here, it was necessary to select those people in our environment who fulfill the competence criteria of our target.

Snowball sampling: This method works very well on the Internet (Duguay, 2016), which was our main administration channel. We rely on our network meeting the selection criteria to recommend and distribute our survey to other people who fulfill the competence criteria.

Quota sampling: The sample here is determined according to specific descriptive characteristics, identical to those of the parent population, in the form of quotas. "Quota sampling is arguably preferable to other forms of non-probability sampling (such as judgmental sampling) because it requires the inclusion of members of different sub-populations in the sample" (Canada Statistics, 2016).

The sample size of a study is a determining factor to obtain reliable data to connect with a proportion for the population. The reliability of the data is never absolute, but is rather in a trust interval. More this interval must be small, or more the error margin must be small, more the sample size will have to be large to obtain a right value of this proportion in the whole population. To determine the sample size we used the formula of Dessel (2016):

$$N = \frac{(Z)^2 p (1 - p) / D^2}{}, \text{ or when } p = 1/2 (0.5), \text{ Then } N = \frac{(Z)^2}{4d^2}$$

In our case, to calculate a proportion with a degree of confidence of 95% and one error margin of 5% we thus obtain:

$$N = (1.96)^2 / (0.05)^2 = 317.48, \text{ we round } N \text{ to obtain a sample of 318.}$$

Thus we chose to combine three forms of sampling starting with a convenience sampling which has quickly and intentionally switch towards a snowball sampling, and in this process we choose to apply the principle of quota sampling. The choice to proceed this way emanates first of all from the context constraints of the context and then of our will to reduce to most possible, taking into account the nature of the empirical methods, the skews attached to this family of sampling procedure.
2.1.2 Survey administration

In this step, the quotas are based on proportions of Moroccan population. We divided the sample into equal proportions between the sexes, which would give in a rounded way, according to last censuses' of the Moroccan population for 2016, 160 women (50.3%) and 158 men (49.7%).

Considering the digital aspect of our research more especially that our target is mainly made up of people users of OTAs and application of M-ticketing, it would be almost skewed to use another mode of administration the survey. The administration of the survey, in its majority, intuitively was done on Internet. This technique proves to be effective to touch a great number of responders geographically dispersed and treats almost instantaneously the answers obtained (Hamadi, 2010).

We started by sheltering the survey on the on line server most used namely “Google drive”. The method of diffusion is suitable to the three techniques of on line investigation developed by Galan and Vernette (2000) and which consists in building the survey on a server dedicated to the administration of on line investigations and then to send it by E-mail to the participants. The answers are directly safeguarded on the server. The only small difference it is that the link of our survey was diffused not only by E-mails but through the service offered by our own social media accounts. The survey takes the form of a measurement to the acceptance antecedents of mobile ticketing considered as innovation of use based on several works on technological acceptance.

3. Results and discussion

3.1 Scales purification

A factorial analysis exploratory FAE and confirmatory one FAC were led in order to allow the purification of the scales selected and to test their reliabilities and validities. The obtained out indicators of these two studies are recapitulated in the following table.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>KMO</th>
<th>BARTLETT</th>
<th>CRONBACH’s ALPHA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>,725</td>
<td>,000</td>
<td>,663</td>
</tr>
<tr>
<td>Perceived utility</td>
<td>,778</td>
<td>,000</td>
<td>,739</td>
</tr>
<tr>
<td>Esthetics</td>
<td>,815</td>
<td>,000</td>
<td>,876</td>
</tr>
<tr>
<td>Trust</td>
<td>,920</td>
<td>,000</td>
<td>,995</td>
</tr>
<tr>
<td>Hedonism</td>
<td>,693</td>
<td>,000</td>
<td>,700</td>
</tr>
<tr>
<td>Ease of use</td>
<td>,766</td>
<td>,000</td>
<td>,718</td>
</tr>
<tr>
<td>Attitude</td>
<td>,768</td>
<td>,000</td>
<td>,875</td>
</tr>
<tr>
<td>Intention</td>
<td>,921</td>
<td>,000</td>
<td>,994</td>
</tr>
</tbody>
</table>

Table 2: Combined results of exploratory and confirmatory factorial analysis

Exploratory factorial analysis leded to the suppression of 3 items of different variables showing a factorial contribution lower than 0, 5 and which improves the alpha of CRONBACH and the explained variance by removing them.
Suppression of “Per-uti5”: I think that this application brings me a diverting experience.
Suppression of “Esthes5”: My application presents its graphic charter clearly.
Suppression of “Hedo2”: I find my application very pleasant thanks to new technologies.

Confirmatory factorial analysis (CFA) leaded to the suppression of more items allowing the improvement of our scales. Indeed, while being based on a factorial contribution higher than 0,5 and $R^2$ higher than 0,3 without neglecting T of STUDENT that must be higher than 1,96 in absolute value and a significance P lower than 0,05 we carried out following eliminations.

Suppression of “Info2”: The application meets my needs for information.
Suppression of “info6”: My application proposes the adequate quantity of information.
Suppression of “hedo1”: On my application you live an amusing experience.
Suppression of “Ease–use1”: I find my application easy to use.
Suppression of “Ease–use5”: My application facilitates my life.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>Chi²</th>
<th>Chi²/ddl</th>
<th>P</th>
<th>GFI</th>
<th>AGFI</th>
<th>SRMR</th>
<th>NFI</th>
<th>NNFI</th>
<th>CFI</th>
<th>RMSEA</th>
<th>AIC</th>
<th>Cronbach’s alpha</th>
<th>Joreskög’s Rhô</th>
</tr>
</thead>
<tbody>
<tr>
<td>Information</td>
<td>9,382</td>
<td>4,690</td>
<td>.009</td>
<td>.986</td>
<td>.928</td>
<td>.037</td>
<td>.980</td>
<td>.951</td>
<td>.984</td>
<td>.010</td>
<td>20,000</td>
<td>.821</td>
<td>.826</td>
</tr>
<tr>
<td>Perceived utility</td>
<td>3,353</td>
<td>1,676</td>
<td>.018</td>
<td>.995</td>
<td>.974</td>
<td>.013</td>
<td>.994</td>
<td>.993</td>
<td>.998</td>
<td>.013</td>
<td>19,353</td>
<td>.805</td>
<td>.843</td>
</tr>
<tr>
<td>Esthetics</td>
<td>10,208</td>
<td>5,104</td>
<td>.006</td>
<td>.985</td>
<td>.923</td>
<td>.022</td>
<td>.994</td>
<td>.985</td>
<td>.995</td>
<td>.011</td>
<td>20,000</td>
<td>.920</td>
<td>.933</td>
</tr>
<tr>
<td>Confidence</td>
<td>25,454</td>
<td>2,828</td>
<td>.000</td>
<td>.991</td>
<td>.822</td>
<td>.007</td>
<td>.963</td>
<td>.942</td>
<td>.965</td>
<td>.049</td>
<td>42,000</td>
<td>.796</td>
<td>.995</td>
</tr>
<tr>
<td>Hedonism</td>
<td>2,490</td>
<td>1,245</td>
<td>.028</td>
<td>.996</td>
<td>.980</td>
<td>.014</td>
<td>.995</td>
<td>.997</td>
<td>.999</td>
<td>.027</td>
<td>18,490</td>
<td>.995</td>
<td>.836</td>
</tr>
<tr>
<td>Facility use</td>
<td>4,854</td>
<td>2,427</td>
<td>.088</td>
<td>.992</td>
<td>.962</td>
<td>.017</td>
<td>.992</td>
<td>.985</td>
<td>.995</td>
<td>.066</td>
<td>20,854</td>
<td>.808</td>
<td>.844</td>
</tr>
<tr>
<td>Attitude</td>
<td>9,014</td>
<td>4,507</td>
<td>.000</td>
<td>.961</td>
<td>.805</td>
<td>.046</td>
<td>.969</td>
<td>.911</td>
<td>.970</td>
<td>.020</td>
<td>20,000</td>
<td>.875</td>
<td>.916</td>
</tr>
<tr>
<td>Intention</td>
<td>16,401</td>
<td>3,280</td>
<td>.000</td>
<td>.964</td>
<td>.893</td>
<td>.007</td>
<td>.992</td>
<td>.987</td>
<td>.993</td>
<td>.013</td>
<td>30,000</td>
<td>.994</td>
<td>.994</td>
</tr>
</tbody>
</table>

Table 2: Scale’s reliability and validity tests after purification

The exploratory factorial analysis as the confirmatory allowed the purification of the scales through the suppression of some items. The reliability of all the final scales after purification were tested by JORESKÖG’s Rhô higher than 0,80 and validity by CRONBACH’s alpha higher than 0,70 and the stability of the scales by several indicators such as normalized Chi², GFI, NFI which all present very satisfactory values except for some values of Chi² which is very sensitive to the size especially for the studies made on samples of more than 200 people as it is the case for our survey.

3.2 Structural equations test of the general model

The test of the general model by structural equations has shown that two dimensions namely information and esthetics are not significant regards the explanation of the attitude and the intention of use because the test T of STUDENT in absolute value is lower than 1,96 and the significance P superior to 0,05 which leads as to remove them from our general scale.
Table 3: General model test results

We can then deduce the following results:

Hypotheses accepted:
> H1: Ease of use impact positively the attitude towards the mobile ticketing.
> H2: The hedonism impact positively the attitude towards the mobile ticketing.
> H4: trust impact positively the attitude towards the mobile ticketing.
> H5: perceived utility impact positively the attitude towards the mobile ticketing.
> 
Rejected Hypotheses:
> H3: Aesthetics impacts positively the attitude towards the mobile ticketing.
> H6: information positively impacts the attitude towards the mobile ticketing.

3.3 Mediation test

Table 4: mediation test results

- Mediation test showed that the mediation is direct for trust because the mediation link between trust and intention of use that became significant after the introduction of the variable “attitude”.
- The mediation is partial for the perceived utility, the hedonism and the ease of use because the link remains significant after the introduction of the mediating variable “attitude”.

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atti &lt;--- Info</td>
<td>0.087</td>
<td>0.084</td>
<td>1.042</td>
<td>.297</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Per-uti</td>
<td>0.201</td>
<td>0.069</td>
<td>2.935</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Esthe</td>
<td>-0.028</td>
<td>0.047</td>
<td>-0.600</td>
<td>.548</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Ease –use</td>
<td>1.670</td>
<td>0.148</td>
<td>11.290</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Hedo</td>
<td>2.113</td>
<td>0.179</td>
<td>11.786</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Trust</td>
<td>0.205</td>
<td>0.050</td>
<td>4.076</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Inten &lt;--- Atti</td>
<td>1.064</td>
<td>0.029</td>
<td>36.743</td>
<td>***</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Estimate</th>
<th>S.E.</th>
<th>C.R.</th>
<th>P</th>
<th>Label</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atti &lt;--- Trust</td>
<td>0.058</td>
<td>0.017</td>
<td>3.376</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Hedo</td>
<td>7.418</td>
<td>1.396</td>
<td>5.315</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Ease –use</td>
<td>0.727</td>
<td>0.060</td>
<td>12.076</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Atti &lt;--- Per-uti</td>
<td>-0.041</td>
<td>0.023</td>
<td>-1.806</td>
<td>.071</td>
<td></td>
</tr>
<tr>
<td>Inten &lt;--- Atti</td>
<td>-1.778</td>
<td>0.631</td>
<td>2.816</td>
<td>.005</td>
<td></td>
</tr>
<tr>
<td>Inten &lt;--- Per-uti</td>
<td>-1.131</td>
<td>0.107</td>
<td>2.972</td>
<td>.003</td>
<td></td>
</tr>
<tr>
<td>Inten &lt;--- Trust</td>
<td>0.398</td>
<td>0.146</td>
<td>2.737</td>
<td>.001</td>
<td></td>
</tr>
<tr>
<td>Inten &lt;--- Hedo</td>
<td>11.378</td>
<td>3.201</td>
<td>3.554</td>
<td>***</td>
<td></td>
</tr>
<tr>
<td>Inten &lt;--- Ease –use</td>
<td>0.750</td>
<td>0.139</td>
<td>5.408</td>
<td>***</td>
<td></td>
</tr>
</tbody>
</table>

Table 4: mediation test results
The hypothesis H7: “the attitude impacts positively the intention of use towards the applications of ticketing” is accepted.

4. Conclusion and prospects:

To conclude, it is appropriate to expose the main contributions of this paper, its different limits and finally further opportunities of development.

4.1 Contributions of the research

> Theoretical contributions:

At the theoretical level, the model ultimately proposed predicts that the mobilization of dimensions acting on acceptance in a "mobile self-service" context transforms the very nature of the elements on which the cyber users relies to develop the intention of use of a ticketing application. Thus, we demonstrate through the results of this research the dimensions of the intention of use in a North African context. These are essentially four factors, hedonism, ease of use, perceived usefulness and finally trust.

We complete our theoretical contribution by examining the mediating role of attitude. Indeed, we started by studying the impact of the dimensions of acceptance on attitude and then the influence of attitude on intention. And then, for the first time in this context, we were able to study the causal approach of mobile ticketing - attitude- intention of using applications.

> Methodological contributions:

From a methodological point of view, this work makes two major contributions, namely the creation of a general measurement instrument for technological acceptance adapted to mobile ticketing context essential for both researchers and managers. This consisted in the creation of several measurement scales that are still little or not at all used in a Moroccan context and for mobile ticketing. The first is the creation of a scale to measure the intention to use mobile ticketing applications. The creation of this measurement instrument was subject to a solid creation process (exploratory qualitative analysis, exploratory factorial analysis and confirmatory factorial analysis) and displays a very good psychometric quality.

The second contribution is the use of a fusion between the C-OAR-SE method (Rossiter, 2002) and Churchill's paradigm (1979) only used once on a Moroccan context by Hamadi and Hathout (2020) and never on a mobile context. The common practice is to choose and align with one of these two methods. That said, and for the sake of rigor, we have sought to limit the biases related to the limits of each method. This merger allowed us to guarantee the statistical validity of our scales but at the same time to reduce the rigidity of the Churchill paradigm.
Managerial inputs:

The results of our research provide some answers to assist service company managers in the launch, distribution and the acceptance of their mobile applications.

- Managing the acceptance of mobile ticketing.

The North African mobile user bases his adoption of an innovation on dimensions that are specific to him and develops a positive intention of use towards it. We have therefore conducted a study on the determinants of acceptance of mobile applications for the sale of electronic tickets in order to provide managers of service companies with a toolbox capable of assisting them in piloting the launch, acceptance and use of their applications by cyber consumers. This research will allow the management of the antecedents of the attitude towards the mobile ticketing applications and the intention to use and adopt these new channels as a means of proximity with the Moroccan Mobile users.

- Managing the dimensions and antecedents of the intention to use mobile ticketing.

The creation of a measurement scale specific to the intention to use in a mobile ticketing context has made it possible to understand, firstly, that this is the willingness of Internet users to use mobile ticketing applications in any way (install, create an account, browse, compare or buy). As for the antecedents of this dimension, they represent a multi-stop causal path that must be mastered by practitioners seeking to improve their mobile presence.

No matter how important the results of such a research work are, it is only wise to recognize its limitations and to look at the possibilities for improvement or further development.

4.2 Limitations of the research

- Limitations related to the research context:

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

- Limitations related to technological development:

The development and the ascending rise of new mobile technologies, distribution channels, new sales aids as well as security technologies, managerial practices, the behavior of ticketing giants (Google flight, Tripadvisor, Trivago, Booking...), the behavior of Internet users, and everything that could follow, is likely to make, progressively or promptly, the results obtained during this research work obsolete.

- Limitations relating to the sampling method:

We were initially promised the North African database of one of the inspected OTAs, on the basis of which we intended to carry out probability sampling. Ultimately, no such database was available to us, so we were forced to proceed with a non-probabilistic sampling method. Thus, for better accuracy, we chose to combine three different methods: convenience sampling, snowball sampling and quota sampling.
Limitations related to sample size:
The size of our sample, 401, of which 323 are usable after the removal of expert responses and the first pre-test collection, although it far exceeds the minimum necessary for modeling by structural equations (200), and is statistically well founded, is average and can be increased in the perspective of better representativeness and external validity.

4. Future research perspectives

Extension of the field of study:
Indeed, it would be interesting to verify the validity of our model in different or more extensive contexts. Geographical extension by going beyond the Maghreb in borders, sectoral contextualization by extending the results of this work to other service sectors (e.g. telephony or banking services), or even to a special pricing mode such as yield management. Also, for conceptual framework it would be interesting to include several other applications of different categories not only for ticket selling.

Enriching the conceptual model:
Another perspective of research is to examine the possibility of incorporating other variables into our model, variables that could enrich the holistic meaning of our results. For example moderating variables related to the characteristics of the study population such as age, gender, length of time in use of mobile devices or past experience with OTA applications. In addition, the examining of other existing antecedents to the attitude towards not only mobile ticketing but mobile applications in general.

Bibliography:
Bathelot, B. (2015), Définition: marketing sensoriel, Définitions marketing «L’encyclopédie illustrée ».


Hathout C. (2020), Analyse de la relation entre les stratégies de communication électronique et l’efficacité réseau-publicitaire: cas des entreprises touristiques opérant par yield management, thèse de doctorat en sciences de gestion, université CADI AYYAD Marrakech.


