



## Working paper series

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### WP BSAD 10.05

#### WHO MIGHT ENGAGE IN MOBILE-COMMERCE? EXTENDED TAM MODEL AND MOBILE SHOPPER TYPOLOGY

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# ***WHO MIGHT ENGAGE IN MOBILE-COMMERCE? EXTENDED TAM***

## ***MODEL AND MOBILE SHOPPER TYPOLOGY***

**December 2010**

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### **Abstract**

Research into mobile-shopping (MS) is currently the focus of much attention both from scholars and the world of business due to the extent to which mobile devices offer vast business opportunities in all global markets. However, few works have compared the validity of the extended Technology Acceptance Model addressing a range of different typologies of possible mobile-buyers. This research helps to understand the different types of potential m-shoppers and the most important ways to favour their intention to use mobile phones to buy.

The goal of this work is twofold: to identify potential m-purchasers based on the reasons and impediments they perceive in mobile shopping, and to highlight major differences in the extended Technology Acceptance Model (TAM) with perceived control and subjective norms in the groups of buyers to emerge. These two goals and the representativeness of the sample, particularly with regards to age intervals, are the main contributions toward this kind of analysis.

Using a sample of 471 Spanish mobile phone users of different ages who have never bought via the mobile, the research shows the differences in extended TAM model between groups of potential buyers. A structural equations analysis is performed.

As a result, the extended TAM model is confirmed. Multisample analysis for four types of potential m-shoppers according to the drivers and impediments to m-shopping (relational, inexperienced, indifferent and transferred buyers) has evidenced that extended TAM does not impact all potential buyers equally.

**Keywords:** mobile-shopping

# **WHO MIGHT ENGAGE IN MOBILE-COMMERCE? EXTENDED TAM MODEL AND MOBILE SHOPPER TYPOLOGY**

## **INTRODUCTION**

Internet commerce having now firmly established its position, one business challenge currently facing enterprises is the possibility of mobile commerce. The widespread use of mobile phones in today's society is beyond question, as is reflected by the constant growth in the number of mobile users around the world, which currently triples the number of land line users (ITU, 2009). Added to this is the forecast for even further growth (the number of mobile phones in Europe in 2008 was 117.4 per 100 inhabitants, compared to only 50.1 in 2000, according to ITU figures, 2009). In Spain, mobile phone use has reached 93.5%, and the number of users acquiring products or services via the mobile has increased 14.8% over the last year (ONTSI, 2008-2009). Yet, as a means of buying and selling, mobile phones remain in their infant stage if compared to the Internet.

The *goal* of this work is twofold: a) to identify potential m-purchasers based on the reasons and impediments perceived in mobile shopping and b) to highlight major differences in the extended TAM model with perceived control and subjective norms in the groups of buyers to emerge. Essentially, the present work thus makes three contributions to the extant literature. First, it is one of the few studies to posit a typology of potential mobile phone buyers based on the incentives and barriers perceived in this kind of purchase. Second, we empirically compare the extended TAM model by including perceived control and subjective norms, doing so for each group of potential buyers through an analysis of multisample structural equations. Third, we have

collected information with personal surveys from a wide sample of different types of buyers in an attempt to gather data from a broad range of mobile phone users, many previous studies having focused primarily on youngsters and/or students (Jeong et al, 2009; Ha et al, 2007; Nysveen et al, 2005).

The work is divided into three parts. In the following section we review the literature on technology acceptance in the case of m-commerce, the Technology Acceptance Model (TAM) emerging as the most widely used theoretical approach. We propose an extended TAM model applied to m-commerce, adding two variables taken from the theory of reasoned action (subjective norm) and the theory of planned behaviour (perceived control). We then describe the sample, highlighting the size thereof and the heterogeneous nature of respondents in terms of age and profession (as mobile phone users). This differs from many previous studies which, for the sake of convenience, focus more on youngsters and/or students. After validating the scales, we test the proposed model. Implications are set out jointly when conducting multigroup analysis. Section three explains the empirical study and testing of the extended TAM model. Taking account of the studies addressing mobile advertising, electronic commerce and Internet commerce, in section four we analyze drivers and impediments to m-shopping. Interviews were conducted with businesses involved in the sector where three experts evaluated the factors pinpointed. Based on these factors, we obtained buyer typology. We then performed multisample structural equations to contrast the proposed model, gauging the moderating effect of the kind of purchaser related to the reasons and barriers to mobile commerce. The final section deals with the main findings to emerge from our research, where we highlight theoretical and management implications, together with future lines of inquiry and discuss how the work may be improved.

## **TAM MODEL, PERCEIVED CONTROL AND SUBJECTIVE NORM APPLIED TO MOBILE COMMERCE. PROPOSED HYPOTHESES**

Acceptance of information and communication technologies (ICT) has basically been explored from two perspectives: from the standpoint of technology diffusion and from the standpoint of the adoption or acceptance of technology. This latter perspective is used to approach the adoption of m-commerce in Spain. This approach has been chosen since m-shopping is currently at an early stage which requires a thorough analysis of how end users view this new means of conducting business. Three acceptance theories form the basis of the research model (Table 1).

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Take in Table 1

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### *The Technology Acceptance Model (TAM) applied to mobile commerce*

From the acceptance standpoint, Davis posited the Technology Acceptance Model (TAM) in 1989, seeking to account for specific behaviour intention through attitude, which in turn depends on perceived ease of use and perceived usefulness. The TAM has been the most widely used and compared approach in literature addressing mobile technology acceptance, and has thus been chosen as the basis for the model posited in the present work. The literature provides examples of the TAM linked to reasons for adopting the use of mobile devices with Internet access (Bruner, 2005; Yeh and Li, 2009). Other studies have evidenced that factors impacting adoption of mobile phones depend on the setting and on the ultimate use made of the service (Fang et al, 2006). The TAM has also provided the basis for exploring the effects of the quality of information provided in service acceptance (Koivumäki, 2008), among others.

More recent studies focus on the acceptance of mobile devices as a means of purchasing in an effort to shed light on which factors facilitate adoption of mobile phone services both from a general viewpoint (Wu and Wang, 2004) and from more specific perspectives—focusing on products and/or specific situations—such as the adoption of multimedia services in third generation mobile devices (Pagani, 2004), adoption of games (Ha et al, 2007), the impact of design on loyalty in m-shopping (Cyr et al, 2006), purchase of m-tickets (Mallat et al, 2009), m-payment acceptance models (Chen, 2008), and determinants in the intent to use m-banking (Gu et al, 2009), amongst others.

Recent years have witnessed the emergence of a number of models extended from the original TAM. Yet, it is important to stress which features distinguish the present research from previous studies and which provide justification for the project. There is the wide-ranging representativeness of the sample, particularly with regard to age intervals, and the different TAM models obtained for each interviewee profile, a further innovation. These are fresh contributions towards this kind of analysis which may help to advance findings from previous research. Two of the key variables in the TAM model are ease of use and perceived usefulness.

Ease of use is defined as the extent to which an individual feels the use of a specific application (or product) to be free from effort (Davis, 1989; Wu et al, 2004). The positive effect of ease of use on the acceptance of purchasing has been evidenced in most studies into mobile marketing (Gu et al., 2009) and mobile commerce (Lu and Su, 2009; Gu et al, 2009). In the purchasing of games via mobile (Ha et al, 2007) ease of use is clearly seen as a pre-requisite to perceived enjoyment, an essential requirement for purchase. The effect of ease of use is clear, particularly for data services in environments other than the conventional Internet setting (Kim et al., 2008).

The use of mobile phones to purchase products and services may lead to a certain complexity from the user standpoint, thereby impacting acceptance. The “complexity” variable was defined by Rogers (1995) in his Theory of the Diffusion of Innovations as “the degree to which an innovation is perceived as difficult to understand and to use.” The size of the screen, or the effect of complexity on means of payment (Mallat, 2007) are factors impacting acceptance of m-shopping, as they influence complexity or ease of use in the purchasing process. The first hypothesis posited is thus:

**H1: Perceived ease of use has a positive impact on attitude to m-shopping.**

Other authors have evidenced how for the case of e-commerce, perceived ease of use directly impacts perceived usefulness (Wu et al, 2004; Ha et al, 2007). This is true for the design of the mobile phone virtual sales site which affords easy navigation, thereby having a positive impact on perceived usefulness (Cyr et al, 2006). This leads us to the second hypothesis:

**H2: Perceived ease of use has a positive impact on perceived usefulness of m-shopping.**

Together with ease of use, perceived usefulness is one of the key factors in acceptance of m-shopping. It has been evidenced for a range of products such as multimedia services (Pagani, 2004) and in settings such as Singapore (Yang, 2005), thereby providing an improvement on the external validity of previous findings obtained in the United States. A positive relation has been shown of perceived usefulness towards attitude. This leads to the following hypothesis:

**H3: Perceived usefulness has a positive impact on attitude towards m-shopping.**

Attitude is defined as the extent to which a person evaluates a specific behaviour favourably or unfavourably, linking knowledge and action (Ajzen and Fishbein, 1980). The TAM model posits a positive causal relation between attitude and purchase or use intention and has been evidenced in various studies (Yang, 2005; Al –Gahtani et al., 2007; Reutterer and Walter, 2009). Here we test it for the case of m-shopping.

#### **H4: Attitude towards m-shopping has a positive impact on m-shopping intention.**

The TAM model is based on the Theory of Reasoned Action (TRA), founded on which Ajzen presented the Theory of Planned Behaviour (TPB) five years later. For the extended TAM model, we assess the contribution of the variables of the two initial theories: subjective norms taken from the Theory of Reasoned Action, and perceived control in behaviour from the Theory of Planned Behaviour. The use of the mobile phone is framed within a social context, which is why the two variables may help to predict behaviour.

##### *The Theory of Reasoned Action (TRA) applied to m-shopping*

The Theory of Reasoned Action (TRA) posits that subjects' behavioural intention merges two kinds of factors: attitudinal (of a personal nature) and behavioural (based on social influence, and referred to as subjective norms). In the TRA model, behaviour is therefore a function of intention. Intention depends on subjective norms and attitude to behaviour. We have already mentioned the attitude variable with the TAM model and we now explain the importance of subjective norms.

Subjective norms reflect the perceptions a person has with regard to what others believe he or she must do (Pedersen, 2005; Gilbert and Han, 2005). The TRA holds that a person's subjective norms are shaped by a multidimensional function which embraces personal beliefs regarding the norms and expectations they perceive from specific referent individuals or groups, and their motivation to comply with such expectations (Teo and Pok, 2003).

Battacherjee (2000) posits that subjective norms should be formulated via external influences and interpersonal influences. Pervious studies into online purchase acceptance have highlighted a range of factors encompassed in the concept of "subjective norms": External influences (Gilbert and Han, 2005), interpersonal influences (Pedersen, 2005), normative pressure (Nysveen et al, 2005) and social influence (Kim et al, 2008; Gu et al, 2009), all of which point to mobile phone



use perceived as a social fact. As such, users tend to gather information from referent individuals or groups (relatives, workmates or the media) with a view to acceptance [Pedersen, 2005]. The expectations and opinions of these referent individuals or groups may impact perceived usefulness and behavioural intention, as proposed by Venkatesh and Davis (Vendatesh and Davis, 2000). We thus posit the following two hypotheses:

**H5: Subjective norms have a positive impact on perceived usefulness.**

**H6: Subjective norms have a positive impact on perceived purchase intention.**

*The Theory of Planned Behaviour (TPB) applied to m-shopping*

The Theory of Planned Behaviour, proposed by Ajzen (1985), adds the perceived control of behaviour variable to the TAM model, reflecting an individual's perception regarding the ability to develop the given behaviour. The new variable contributes to the Theory of Reasoned Action by accounting for situations in which perception of the availability of the necessary resources and skills required to behave in a specific manner impacts the decision whether to accept or not.

Ajzen (1991) defined perceived control as the individual's perception of the ease or difficulty of performing the behaviour of interest. Perceived control embraces two factors: availability of resources and/or skills required to fulfil the desired behaviour (referred to as the 'facilitating conditions') (Pedersen, 2005; Gilbert and Han, 2005; Lu et al, 2005; Gu et al, 2009), and the self-belief individuals have in their ability to perform the behaviour successfully (Teo and Pok, 2003; Pedersen, 2005; Chen et al, 2009; Gu et al, 2009; Battacherjee, 2000). The term perceived control is also linked to Bandura's (1994) concept of perceived self-efficiency, referring to the belief individuals have vis-à-vis their ability to deal with specific situations.

In the case of m-banking, self-belief has a direct impact on perceived ease of use. Strong self-belief on the part of users impacts perceived ease of use in an m-banking environment, making

them feel more comfortable about conducting operations from their mobile phones. This leads us to posit hypotheses seven and eight:

**H7: Perceived control has a positive impact on perceived ease of use.**

**H8: Perceived control has a positive impact on purchase intention.**

The eight previous hypotheses make up the extended TAM model we aim to test, and are shown in Figure 1.

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Take in Figure 1

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## **EMPIRICAL STUDY**

In order to verify empirically the hypotheses posited we conducted an empirical study, the results of which are reported in this section. We first detail the scope of the study and identify the sample chosen for the analysis. We then present the measuring scales of each of the variables together with their validation and, finally discuss the findings to emerge from the proposed model.

### *Scope of study and sample*

The empirical analysis was carried out using information gathered through personal interviews with Spanish mobile phone users who had never used the mobile to acquire products or services. Field work was conducted towards the end of 2009. The survey lasted an average of 15 minutes and an effort was made to ensure that the order of the questions did not affect responses. A sample of 476 individuals was obtained out of a total of 600 attempts. The sample was filtered, five questionnaires being removed due to incompleteness or erroneous answers, bringing the final sample down to 471 individuals (a final response rate of 78.5%).

Sampling was conducted randomly in age bands, not just youngsters, to ensure that respondents would reflect a range of features. The sample is representative of Spanish mobile phone users

(INE, 2009). Table 2 shows the characteristics of the sample group in terms of sex, age and educational qualifications. 54% of those in the sample group had bought online, and only 8.5% evidenced any intention to engage in m-shopping in the coming year. 64% of those in the sample belong to social networks. Interviewees were also given the choice of four categories of products or services should they opt to engage in m-shopping: television, banking, travel and small payments. Those in the sample chose small payments (74.1%), travel (16.1%), television via mobile (6.8%), banking (4.2%). Interviewees responded to the variables of the extended TAM model in the category of product/service chosen.

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Take in Table 2

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5 point Likert scales were used to measure the variables. Scales to measure ease of use and perceived usefulness were adapted from Davis et al. (1989), Wu and Wang (2005) and Anh et al. (2004); attitude towards m-shopping was adapted to m-shopping based on Zaichkowsky (1994), Goldsmith (2002) and Taylor and Todd (1995); subjective norm was taken from Nysveen et al. (2005), Yang (2007); Ventkatesh and Davis (2000); the scale for perceived control was drawn up based on Taylor and Todd (1995), George (2004) and Schifter and Ajzen (1985), and finally m-purchase intention was adapted from the works of Goldsmith (2002), Taylor and Todd (1995).

#### *Validation of scales and comparison of the model*

We validated the measuring scales for the variables and in Table 3 we present the reliability and validity findings to emerge from the confirmatory factor analysis conducted. Reliability and convergent and discriminant validity of the scales is confirmed (Bagozzi and Yi, 1988). The confirmatory factor analysis fit is good, although it was necessary to remove two variables due to the correlations of their measuring errors. In order to ascertain the latter, we checked to ensure

that the extracted variance for each construct was in all cases greater than the squared correlations with the other constructs.

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Take in Table 3

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Having validated the scales, we sought to verify the proposed hypotheses (H1 to H8). The model shows an acceptable fit ( $\chi^2=1288.964$  ( $p=0.00$ ); RMSEA=0.085; NFI=0.929; CFI=0.938; IFI=0.938; GFI=0.899) and all the hypotheses were borne out, except that referring to the direct influence of perceived control on purchase intention (see Figure 2). The SPSS 18.0 and LISREL 8.7 programs were used for all the analyses.

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Take in Figure 2

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Take in Table 4

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## **DRIVERS AND IMPEDIMENTS TO M-SHOPPING. MODERATING EFFECT OF POTENTIAL BUYERS**

### *Drivers and impediments to m-shopping*

Another aim of this study was to ascertain the main drivers and impediments which induce mobile phone users to purchase or not using their phones. To gather information concerning drivers and impediments we adopted three approaches:

We first drew up a list of the factors which might influence mobile phone user purchase decision. These were taken from research published up to 2009 included in renowned journals listed in the ISI Journal Citation Report. 104 variables were obtained (Table 5).

We then took into account the fact evidenced in earlier studies that acceptance of new information and communication technologies is dependant upon previous experiences (Mallat et al, 2008). Experience of previous adoptions, an awareness of recent innovations and an acceptance of related technological products impact both ease of use as well as perceived usefulness in m-commerce (Yang, 2005). As reflected in the data we present later, it is clear that most users who opt to engage in transactions using their electronic devices have had previous experience of e-commerce over the Internet. Bearing this in mind, we added basic references dealing with Electronic Commerce to our study, some of these variables having already been considered in m-commerce literature.

Third, to make the study applicable in a practical sense, and as a necessary condition of the cooperation agreements undertaken with two Spanish firms involved in the sector, we included variables whose principal objective was to provide a full profile of potential buyers. Said variables include demographic and sociological aspects, and those related to technological issues which, according to the experts, might prove key to defining the various user profiles.

Finally, we conducted an evaluation with experts to determine which variables obtained using the three previously mentioned procedures were, in their experience, the most relevant. Table 5 lists the references supporting the chosen variables:

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Take in Table 5

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From the extensive compilation of variables, we formulate the final hypothesis which completes the model we propose and compare in the work, and which considers the moderating effect of the kind of purchaser depending on perceived drivers or impediments to m-shopping:

**H9: Drivers and impediments to m-shopping impact the relations presented in the extended TAM model in Figure 1.**

To measure drivers and impediments to m-shopping, we used 5 point Likert scales from the literature and from a brainstorming session, together with interviews conducted with a convenience sample of 15 consumers and five firms, given the innovative nature of m-commerce applications. We used 15 indicators to measure impediments, and 20 indicators to measure drivers

*Obtaining a typology of potential buyers depending on drivers and impediments to m-shopping*

The exploratory factor analysis conducted into the impediments to m-shopping yielded four factors (60.104% explanation of variance), and the drivers a further four factors (54.66% explanation of variance), clearly reflecting the kind of impediments and drivers taken into account when reviewing the literature (Table 6). The main obstacle is the lack of personal relation, the second involving problems linked to the use of mobiles for purchasing. The third relates to mobile phone transaction costs, and the fourth to two problems related to the kind of product. As regards drivers, we may highlight a convenience factor, another linked to the performance of the firm, one reflecting reasons related to marketing-mix variables, and finally one relating to special advantages.

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Take in Table 6

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Using these eight factors, we performed a cluster analysis (k-means) to pinpoint the profiles of various individuals with regard to drivers and impediments. ANOVA analyses show that the eight factors are statistically significant when defining user groups (Table 7). The four m-commerce user groups to emerge are:

1. *Relational users* (18.4%): Although these subjects accept that m-commerce affords certain advantages in terms of convenience and marketing-mix, they also perceive most problems due to a lack of personal contact with salespeople and other buyers. They also feel that e-commerce implies high costs.

2. *Users transferred from other mediums* (29.27%): These subjects do not perceive more impediments than other groups, although they do consider factors related to the firm selling, such as reputation, sales experience in other mediums and information provided, to be important reasons to engage in m-commerce. However, they see the fewest special advantages to purchasing via the mobile.

3. *Inexperienced users* (30.62%): This group, the largest of the four, perceives special advantages to engaging in m-commerce related to payment, enjoyment or less impulse buying, yet deems product and price to be worse (poorer marketing-mix). They highlight greater problems than other groups regarding mobile phone use in addition to problems related to certain products, such as sell-by dates.

2. *Indifferent users* (21.68%): This kind of user sees no impediments to m-shopping, but on the other hand fails to see sufficient reasons to engage therein.

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Take in Table 7

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Empirical findings are consistent with some of the drivers and impediments proposed in the literature on electronic commerce and m-commerce. One factor common to the two models is the lack of personal relations, confirming that the physical distance separating consumer and firm does prove a stumbling block to m-shopping. This finding is supported by Zeithalm et al, (2000)

and Rohm and Swaminathan (2004). Other factors specific to m-commerce such as transaction costs (Davis, 1989; Pagani, 2004; Turel et al, 2007; Kim et al, 2007; Mallat et al, 2008; Kim et al, 2008; Khalifa and Chen, 2008) and problems using the mobile emerge as impediments (Jeong et al, 2009; Mallat et al, 2007).

Although “convenience” is common to both electronic and mobile commerce, in the latter case it involves a specific mobility factor which in certain studies appears individually as “mobility” (Mallat et al, 2007, 2008; Kim et al, 2008). Our analysis also adds to the literature several drivers and impediments to m-commerce acceptance not considered in previous research. One example is impediments linked to the kind of product (sell-by date or need to plan the purchase) as well as other specific reasons (ease of shopping for the disabled, advantages similar to online shopping when consumers have acquired a certain purchase behaviour). Moreover, experts stated company reputation and the latter’s performance as key factors to account for m-commerce (the firm’s sales experience through other channels, the marketing mix or credibility of the information provided). Studies along this line are beginning to emerge (Lin and Shi, 2008) evidencing that trust in those selling over the mobile phone impacts user intention to continue engaging in the use of m-commerce services.

#### *Multigroup comparison of the extended TAM model*

Having approximated the overall model and the kind of buyer, our interest in this section focuses on the moderating effect of buyer typology on the proposed model. In Tables 8 and 9 we show the results of calculating the restricted multisample model and for different coefficients (the statistically significant coefficients for a confidence level of at least 95% are highlighted in bold). There is a general moderating effect of the type of buyer reflecting drivers and impediments to engage in m-shopping (dif.  $\chi^2 = 40.58$ ).



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Take in Table 8

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Take in Table 9

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It can be seen how perceived usefulness is not sufficient to engender a more positive attitude towards m-shopping on the part of relational buyers, who continue to prefer shopping in traditional establishments. In buyers we refer to as transferred from other mediums, the proposed model is reproduced with no major differences compared to other groups. Inexperienced users form a particular group in which perceived control boosts their intention to purchase via this medium. Moreover, this group emerges as the one most influenced by external expectations and opinions when engaging in m-shopping (subjective norm variable). As a result, the extended TAM model acquires greater relevance in the groups of inexperienced users than in the remaining groups. In the inexperienced and indifferent groups, perceived control proves more relevant than in the other two groups when leading them to perceive greater ease in m-shopping. Nevertheless, subjective norms have a greater impact on their perception of the usefulness of m-shopping than in the relational and transferred users. Finally, the influence of the referent group has less of an impact on the purchase intention of those who are indifferent than on all the remaining users, in that perceived usefulness impacts their attitude towards m-shopping less than in the other groups. Taking these findings into account, our work bears out Davis's (1989) extended TAM model with perceived control and subjective norm mainly in the case of inexperienced users. We noticed differences amongst the various user groups depending on the variables which prove most relevant in each case to reflect intention to use the mobile phone for purchasing. In 2005, Pedersen carried out an empirical analysis which tested the extended TAM model with perceived

control and subjective norms only for “early adopters” (who may be likened to the potential buyers in our research, particularly those most inclined towards m-shopping, transferred users).

Our findings also concur with those of Kim et al. (2008), who evidence that perceived usefulness and social influence are more important to discontinuers than to continuer users. Regular users placed greater trust in external sources of information than in internal sources such as relatives or friends, causing the “subjective norm” variable in its “internal influences” component to have less of an impact. In our study, none of the consumers had made a purchase via mobile, meaning that they resembled occasional users more and indeed the influence of perceived control and subjective norms was in evidence.

These findings would seem to suggest to firms the importance of segmenting their target audience and of implementing a varied range of policies to persuade each of these groups to engage in m-shopping. Although it may prove difficult to encourage relational users to engage in this kind of purchase, it is necessary to appeal to the group and to enhance perceived control for inexperienced users so as to induce them to make m-purchases, strengthening perceived usefulness so that those who are indifferent will buy by showing them the differential advantages of this kind of purchase. Finally, users who evidence greater trust in the firm and in its performance and products (transferred) are more likely to engage in m-shopping as they focus more on the firm and on the products than the medium through which they sell, whether conventional, online or mobile.

## **CONCLUSIONS AND IMPLICATIONS OF THE STUDY**

The initial *goal* we sought to achieve when the work commenced was to: a) to describe those who might engage in m-commerce depending on perceived drivers and impediments and b) to

highlight significant differences in the extended TAM model with perceived control and subjective norms in the purchase groups to appear.

Having concluded the study, we may highlight the various *contributions* to emerge. The first is that our work is one of the few focusing on m-commerce to include a large number of motivating and inhibiting factors taken from previous studies and drawing on the opinions of users and firms. The second contribution relates to the sampling, which was conducted randomly and based on personal surveys so as to exercise tighter control. A large number of responses have been obtained together with a varied structure of the sample with regard to age, academic qualifications and profession in order to acquire greater representativeness in the universe of mobile phone users, a common shortcoming in many existing studies. The third and most innovative of all the contributions to emerge is that our study describes potential m-purchasers in Spain, and goes on to describe differences in the extended TAM model in each group. We are not aware of any similar analysis having been conducted to date.

By way of the *conclusions* to emerge from the analyses performed we may point out that the extended TAM model is confirmed for subjective norms and perceived control. Subjective norms evidence a direct impact on users' perceived usefulness as well as their intention to purchase. Perceived control also influences perceived ease of use, although the study failed to reveal any direct relation with purchase intention. Further, multisample analysis has evidenced that although the proposed model proves valid for all four groups, it does not impact all potential buyers equally. The most significant differences were seen to be the following:

In **relational buyers** (who value the advantages of m-shopping yet perceive high costs in this kind of purchasing as well as a loss of value due to lack of personal contact), ease of use does not significantly impact attitude towards m-commerce. **Inexperienced users** (who value the

particular features of m-shopping positively and who see price, the use of the mobile phone and the quality of the product as the main impediments to m-shopping) are more influenced than other groups by referents who value possible purchases positively (subjective norms). Further, unlike other groups, they evidence a greater intention to purchase the greater the perceived control. **Indifferent** users (who display no particular inclination either in terms of any perceived advantages or impediments regarding m-shopping) emerge as the least motivated to meet the expectations of their referent group. However, this group attaches the greatest importance to the usefulness of m-shopping as an acceptance factor.

Finally, the **transferred** group evidences no significant variations in the model with regard to the remaining groups. They see fewest special advantages in m-shopping, which we attribute to their prior experience in other mediums. They also attach particular importance to variables related to the firm's performance (reputation, information provided, presence in other sales channels).

As for *managerial implications*, our research has highlighted two large groups of purchasers. Firstly, there are those users who are relatively inexperienced or unprepared for m-shopping, a fact which public bodies and firms might seek to address through public initiatives or progress in society itself. Consumers need to see sufficient advantages to m-commerce which will enhance their interest therein, and lead them to familiarise themselves with the technology. It is also important that those who are pioneering as buyers and are the first to engage in such an activity are satisfied with the experience. This will induce them to act as ambassadors to those less familiar with or less willing to engage in m-commerce. A second group of a similar size (buyers transferred from other kinds of purchasing) encompasses individuals who may become involved in m-shopping provided the firm offers sufficient guarantees in terms of reputation, prior experience and information provided. The other two groups are relational users and indifferent users. The former are unlikely to engage in m-shopping as indeed they are unlikely to do so via

Internet if other mediums of shopping are available which can provide them with the opportunity to enjoy personal contact with sales staff and to interact with other consumers, and whilst they perceive m-commerce to be more costly. The second is also a difficult group to deal with since, although they see no major impediments to this kind of commerce, nor do they see any particular advantages compared to other forms of shopping.

As regards *limitations* to the work, it should be pointed out that the information was only gathered in Spain, thus preventing generalisation of the model to other geographical or cultural settings. Further, we have also focused on mobile phone users who have yet to purchase using this particular medium, leaving for future research a comparison with individuals who have already acquired a product or service using the mobile. To assess users' true perception of this medium of purchasing, we deem it more appropriate first to analyse subjects who have never used it so as to appraise their real purchase intent without any bias arising from purchases already made in a market which is still in its infancy and in which there is still little regulation.

Finally, several *future lines of work* are currently emerging. It would prove interesting to explore the impact of culture or the geographical setting on perceptions, attitudes and behaviour of on-line buyers (Burgman *et al.*, 2006). It would also prove enlightening to investigate the possibility of contrasting the model for both those who purchase and those who do not purchase via mobile phone compared to those who engage in online shopping or even offline buyers so as to conjecture possible complementarities between the two sales environments. Certain authors assert that transposing offline strategies to virtual environments is risky (Vrechopoulos *et al.*, 2004). Although in this work we focus principally on the variables of the extended TAM model, there are other factors determining purchase intention with mobiles, such as trust or risk, which merit research attention.

## REFERENCES

- Ajzen, I. and Fishbein, M.(1980), *Understanding attitudes and predicting social behaviour*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhl and J. Beckman (Eds.), *Action-control: From cognition to behavior* (pp.11-39). Heidelberg: Springer.
- Al –Gahtani, S. S.; Hubona, G.S. and White Baker, E.(2007): “The effects of gender and age on new technology implementation in a developing country. Testing the theory of planned behaviour (TPB)” *Information Technology and People*, vol. 20, no. 4, pp.352-375.
- Bagozzi, R.P. and Yi, Y.(1988): “On the evaluation of structural equation models”, *Journal of the Academy of Marketing Science*, vol. 16, no. 1 pp.74-94.
- Battacherjee, A. (2002): "Individual trust in online firms: scale development and initial trust", *Journal of Management Information Systems*, Vol. 19 No.1, pp.211-41
- Bruner, G.C. E, (2005): “Explaining consumer acceptance of handheld Internet devices”, *Journal of Business Research*,58(5), pp.553-558.
- Chen, L.(2008):“A model of consumer acceptance of mobile payment”, *International Journal of Mobile Communications*, 6 (1), pp.32-52.
- Chen, J.V., Yen, D.C. and Chen, K (2009):”The acceptance and diffusion of the innovative smart phone use: A case study of a delivery service company in logistics” *Information and Management*, No.46, pp. 241-248.
- Cyr, Diann, Head, M. and Ivanov, A. (2006): “Design Aesthetics Leading to M-loyalty in M-commerce”. *Information and Management*, vol. 43, no. 8, pp.950-963.

- Davis, F. D. (1989): "Perceived usefulness, Perceived Ease of Use, and User Acceptance of Information Technology", *MIS Quarterly*, vol 13, no. 3, pp.319-339.
- Drakatos, N and Kolsaker, A; (2009): "Mobile advertising: The influence of emotional attachment to mobile devices on consumer receptiveness", *Journal of Marketing Communications*, vol. 15, no. 4, pp.267-280.
- Fang, X., Chan, S., Brzezinski, J. and Xu, S. (2006): "Moderating Effects of Task Type on Wireless Technology Acceptance", *Journal of Management Information Systems*, vol. 22, no. 3, pp.123-158.
- George, J. F. (2004): "The theory of planned behavior and internet purchasing", *Internet Research*, vol. 14, No. 3, pp. 198-212.
- Gilbert, A.L. and Han, Hilda, (2005): "Understanding mobile data services adoption: Demography, attitudes or needs." *Technological Forecasting and Social Change*, vol. 72, no 3, pp.327-337.
- Goldsmith (2002): "Explaining and predicting consumer intention to purchase over the internet: an exploratory study", *Journal of Marketing Theory and Practice*, vol. 10, no. 2, pp. 22-28
- Gu, J., Lee, S. and Suh, Y. (2009): "Determinants of behavioral intention to Mobile banking, *Expert Systems with Applications*, no. 36, pp.11605-11616.
- Ha, I., Yoon, Y and Choi, M (2007): "Determinants of adoption of mobile games under mobile broadband wireless access environment", *Information and Management*, vol. 44, pp.276-286.
- Haghirian, M. and Madleberger, M; Akihiro. I. (2008): "Mobile Advertising in Different Stages of development a cross-country comparison of consumer attitudes". *Proceedings of the 41st Hawaii International Conference on System Sciences*, Hawaii

- Hsu, C, Lu,H and H,H.(2007): “Adoption of the mobile Internet: An empirical study of multimedia message service (MMS)”, *Omega*, vol. 35, no.6, pp.715-726.
- ITU (INTERNACIONAL TELECOMMUNICATION UNION) (2009): “Information Society Statistical Profiles 2009: CIS”, retrieved in November 2009 from <http://www.itu.int/ITU-D/ict/>
- Jayawardhena, Ch.,Kuckertz, A., Karjaluoto, H. and Kautonen ,T.(2008). “Antecedents to permission based mobile marketing: an initial examination”, *European Journal of Marketing*, vol. 43, no. 3/4, pp.473-499
- Jeong, N.,Yoo, Y. and Heo, T.(2009) Moderating effect of personal innovativeness on mobile-RFID services: Based on Warshaw’s purchase intention model, *Technological Forecasting and Social Change*, vol. 76, pp. 154-164.
- Khalifa, M. and Shen,K.N. (2008), “Drivers for transactional B2C M-Commerce adoption: Extended theory of planned behavior”, *The journal of Computer Information Systems*, vol. 48, no. 3, pp.111-117.
- Khammash, M. and Parry Sara, J. J, (2009). *Electronic Word-of-Mouth: Why do consumers read product reviews in online opinion platforms? A quantitative study from the UK market? 38<sup>th</sup> Conference EMAC (pp.1-11). Nantes (France.)*
- Kim, H.,Chan, H.C. and Gupta,S. (2007). “Value-based Adoption of Mobile Internet: An empirical investigation,” *Decision support systems*, vol. 43, no. 11, pp.111-126.
- Kim,H., Lee,I. and Kim,J.(2008), “Maintaining continuers vs. converting discontinuers: relative importance of post-adoption factors for mobile data services”, *International Journal of Mobile Communications*, 6 (1), pp.108-132.



- King, W. R. and Jun He, (2006): "A meta-analysis of the technology acceptance model" *Information and Management* vol.,43, pp.740-755.
- Koivumäki, T., Ristola, A. and Kesti, M. (2008): "The effects of information quality of mobile information services on user satisfaction and service acceptance-empirical evidence from Finland", *Behaviour and Information Technology*, 27(5) pp.375-385.
- Lin, Y. and Shih, D., (2009):"Deconstructing mobile commerce service with continuance intention", *International Journal of Mobile Communications*, Vol. 6, no. 1, pp 67-87.
- Lu, H.P and Su, P. Y.J.(2009):"Factors affecting purchase intention on m-shopping web sites", *Internet Research* vol.19. no. 4, pp. 442-458.
- Lu, June; Yu, Chun-Sheng and Liu, Chang (2005): "Facilitating conditions, wireless trust and adoption intention", *The Journal of Computer Information Systems*, 46, pp.17-24.
- Mallat, N., Rossi, M. and Tuunainen, V.K. (2008): "An empirical investigation of mobile ticketing service adoption in public transportation", *Personal and Ubiquitous Computing*, 12(1), pp.57-65.
- Mallat, N. (2007). "Exploring consumer adoption of mobile payments" A qualitative study, *The Journal of Strategic Information Systems*,16(4), pp.413-432.
- Mallat, N.,Rossi, M.,Tuunainen,V.K. and Öörni,A.(2009):"The impact of use context on mobile services acceptance: The case of mobile ticketing", *Information and Management*, 46, pp.190-195.
- Nysveen, H. Pedersen, P.E. and Tohorbjornsen,H.(2005): "Intentions to use mobile services: Antecedents and cross-service comparisons", *Journal of the academy of Marketing Science*, 33(3), pp.330-346.

ONTSI - Observatorio de las Telecomunicaciones y la Sociedad de la Información (Ministerio de Industria, Comercio y Turismo) (2009): Comercio Electrónico B2C 2008 (B2C Electronic Commerce 2008, for a tentative translation). Retrieved in November 2009 from <http://observatorio.red.es/>.

Pagani, M. (2004): "Determinants of adoption of Third generation mobile multimedia services", *Journal of interactive marketing*, 18(3), pp.46-59.

Pedersen, P.E. (2005): "Adoption of Mobile Internet Services: An Exploratory Study of Mobile Commerce Early Adopters", *Journal of organizational computing and electronic commerce* 15(2), pp.203–222.

Ramus, K.; Nielsen, N.A. (2005): "Online grocery retailing. What do consumers think?" *Internet Research*. 15, pp.335-352.

Reutterer, T ; Walter, E.(2009) "How mobile advertising affects consumers :Empirical findings from an SMS direct marketing campaign", *38<sup>th</sup> Conference EMAC Nantes(France)*.

Rogers, E. , *Diffusion of Innovations*(1995), 4th Ed. Free Press, New York.

Rohm, A. and Swaminathan, V. (2004): "A typology of online shoppers based on shopping motivations", *Journal of Business Research*, 57, pp.748-757.

Schifter, D. and Ajzen. I. (1985): "Intention, Perceived Control, and Weight Loss: An Application of the Theory of Planned Behavior". *Journal of Personality and Social Behavior*, vol. 49, pp. 843-851.

Tan, F.B.and Chou,J.P.C. (2008): "The relationship Between Mobile Service Quality, Perceived Technology Compatibility, an Users'Perceived Playfulness in the Context of Mobile

- Information and Entertainment Services”, *International Journal of human-computer interaction*, vol. 24, no. 7, pp.649-671.
- Tanskanen, K., Yrjölä, H. and Holmström, J. (2002): “The way to profitable Internet grocery retailing: six lessons learned”, *International Journal of Retail and Distribution Management*, vol. 30, pp.69-178.
- Taylor, S. and P.A. Todd (1995): “Understanding information technology usage: a test of competing models”, *Information Systems Research*, vol. 6, no. 2, pp. 144–176.
- Teo, T.S.H. and Pok, S.H. (2003): “Adoption of WAP-enabled mobile phones among Internet users” *Omega*, vol. 31, pp.483-498.
- Turel, O., Serenko, A. and Bontis, N. (2007): “User acceptance of wireless short messaging services: Deconstruction perceived value” *Information and Management*, vol. 44, no. 1, pp.63-73.
- Venkatesh, V. and Davis, F. D. (2000): “A theoretical extension of the technology acceptance model: Four longitudinal field studies”, *Management Science*, vol. 46, no. 2, pp. 186-204
- Wu, J.H. and Wang, S.Ch (2004): “What drives mobile commerce? An empirical evaluation of the revised technology acceptance model”. *Information and Management*, vol. 42, no. 5, pp.719-729.
- Yang, Kenneth C.C.(2005): “Exploring factors affecting the adoption of mobile commerce in Singapore”. *Telematics and Informatics*, vol. 22, no. 3, pp.257-277.
- Yeh, Y.S.S. and Li, Y-M. (2009): “[Building trust in m-commerce: contributions from quality and satisfaction](#)”, *Online Information Review*, Vol. 33, no. 6, pp. 1066-1086.

Vendatech, V. y F.D. Davis (2000):“A theoretical extension of the technology acceptance model:four longitudinal field studies”, Management Science, vol. 46, no. 2, pp.186-204.

Zaichkowsky, Judith Lynne (1994), "The Personal Involvement Inventory: Reduction, Revision, and Application to Advertising," Journal of Advertising, (December), Vol. 23, No. 4, pp. 59-70.

Zeithalm, V.; Parasuraman, A.; Malhotra, A., (2000): “Service quality delivery through Web sites: A critical review of extant knowledge”, Journal of the Academy of Marketing Science, vol. 30, no. 4, pp. 362-375.

## TABLES AND FIGURES

**Table 1.**

Most widely used technology acceptance theories in the mobile service sector

<b>Theory</b>	<b>Author</b>	<b>Year</b>	<b>Variables</b>
Theory of Reasoned Action (TRA)	Fishbein and Ajzen	1980	Attitude Subjective norms Behavioural Intention
Theory of Planned Behaviour (TPB)	Ajzen	1985	Attitude Subjective norms Perceived control over behaviour Behavioural Intention
Technology Acceptance Model (TAM)	Davis	1989	Perceived usefulness Perceived ease of use Attitude Behavioural Intention

**Table 2.**  
Characteristics of the sample

<b>Sex</b>	<b>Age</b>		<b>Qualifications</b>		<b>Net monthly income</b>		
Male	46.9%	Under 18	1.3%	No qualifications	0.4%	Below 900 euros	46.2%
Female	52.4%	18-24	39.4%	Basic secondary	0.8%	901-1200 euros	19.3%
		25-34	24.4%	Secondary	2.5%	1201-1500 euros	15.8%
		35-44	21.7%	Upper secondary or vocational training	38.9%	1501-2000 euros	10.1%
		45-54	8.1%	Degree	49.5%	2001-3000 euros	4.4%
		Over 54	5.1%	Postgraduate	5.9%	Over 3000 euros	4.2%

**Table 3.**  
Results of adjusted exploratory and confirmatory factor analyses

Latent variable	Observable variable	Lambda Coefficients		R <sup>2</sup>	Cronbach Alpha	Compound reliability	Extracted variance
		λ	t				
<b>Attitude to MS (ATTI)</b> (28.62% of information explained in the AFE)	MS is worth it	0.885	--	0.784	0.898	0.923	0.708
	MS is good	0.893	--	0.797			
	MS is useful	0.834	26.693	0.696			
	MS is great	0.767	22.394	0.589			
	MS is a good idea	0.821	25.719	0.673			
<b>Perceived usefulness of MS (USE)</b> (12.83% of information explained in the AFE)	Faster than in a shop	0.748	--	0.560	0.833	0.915	0.684
	Better purchase decisions	0.790	23.060	0.625			
	Saves money	0.839	26.019	0.703			
	Better products/services	0.901	30.845	0.812			
	Better value for money	0.833	25.649	0.694			
<b>Perceived usefulness of MS (EASE)</b> (6.73% of information explained in the AFE)	Learning MS is easy	0.810	--	0.656	0.724	0.815	0.563
	Expert help is essential in MS	E	E	E			
	No problems interacting	0.793	21.478	0.629			
	Could be an expert in MS	0.705	17.787	0.497			
	Easy to find products in MS	0.578	13.424	0.334			
<b>MS intention (INTEN)</b> (5.72% of information explained in the AFE)	I intend to do MS next year	0.872	--	0.761	0.89	0.922	0.798
	I hope to do MS	0.950	37.841	0.903			
	I will probably do MS next year	0.856	28.552	0.732			
<b>Subjective norm (SUBJNORM)</b> (4.35% of information explained in the AFE)	My people would approve MS	0.447	9.680	0.200	0.691	0.767	0.540
	Most feel that I should	0.865	--	0.748			
	I am expected to do MS	0.819	20.632	0.671			
<b>Perceived control (CONTROL)</b> (3.72% of information explained in the AFE)	I have the resources, knowledge and skills for MS	0.862	--	0.743	0.808	0.861	0.756
	I would do MS	0.877	21.657	0.769			
	MS would be easier for me than other means	E	E	E			

Note: MS=m-shopping. / E=eliminated

Table 4.

## Hypotheses verification

<b>H1</b>	Perceived ease of use has a positive impact on attitude to m-shopping	<b>Accepted</b>
<b>H2</b>	Perceived ease of use has a positive impact on perceived usefulness of m-shopping	<b>Accepted</b>
<b>H3</b>	Perceived usefulness has a positive impact on attitude towards m-shopping	<b>Accepted</b>
<b>H4</b>	Attitude towards m-shopping has a positive impact on m-shopping intention	<b>Accepted</b>
<b>H5</b>	Subjective norms have a positive impact on perceived usefulness	<b>Accepted</b>
<b>H6</b>	Subjective norms have a positive impact on perceived purchase intention	<b>Accepted</b>
<b>H7</b>	Perceived control has a positive impact on perceived ease of use	<b>Accepted</b>
<b>H8</b>	Perceived control has a positive impact on purchase intention	<b>Rejected</b>



# SOCIAL CAPITAL AND KNOWLEDGE IN INTERORGANIZATIONAL NETWORKS: THEIR JOINT EFFECT ON INNOVATION SOCIAL CAPITAL AND KNOWLEDGE IN INTERORGANIZATIONAL NETWORKS: THEIR JOINT EFFECT ON INNOVATION

**Table 5.**

**Literature references supporting the variables selected by scholars**

<b>Reference</b>	<b>Variables</b>
<i>Gu et al (2009)</i>	<b>Drivers:</b> Intention to use, structural assurances, normality in situations, familiarity, facilitating conditions, trust, social influence, personal efficacy, personal efficiency, perceived ease of use, perceived usefulness and quality of the system
<i>Lu and Su (2009)</i>	<b>Drivers:</b> Ease of access, compatibility, perceived usefulness, mobile skilfulness, enjoyment <b>Impediments:</b> anxiety
<i>Aldás-Manzano et al (2009)</i>	<b>Drivers:</b> Internet compatibility, perceived ease of use, perceived usefulness, attitude, intention to use, mobile affinity, innovativeness.
<i>Chen et al (2009)</i>	<b>Drivers:</b> perceived usefulness, organisational factors, possibilities of observation (degree of difficulty in finding out the benefits of the product), compatibility, perceived ease of use, environmental factors, personal efficiency and intention of use.
<i>Jeong et al (2009)</i>	<b>Drivers:</b> IT knowledge, responsiveness to IT news, ability to use the mobile phone, multifunction phone, perceived need, ease of purchase (purchasability), personal innovativeness in the domain of Information Technologies, intention to buy, income.
<i>Mallat et al. (2009)</i>	<b>Drivers:</b> easy of use, compatibility, perceived usefulness, mobility, context of use.
<i>Hoyoung et al. (2008)</i>	<b>Drivers:</b> Social influence, mobility, perceived usefulness, perceived ease of use, compatibility, value and intention of use <b>Impediments:</b> cost
<i>Lin and Shih (2008)</i>	<b>Drivers:</b> Disconfirmation, mobile technology trusting expectations, personal values, perceived performance, Mobile vendor trusting, satisfaction.
<i>Koivumäki et al (2008)</i>	<b>Drivers:</b> Content quality, connection quality, contextual quality, interaction quality, intention of use, satisfaction
<i>Mallat et al. (2008)</i>	<b>Drivers:</b> attitude, compatibility, previous experience, confidence, mobility, perceived ease of use, perceived usefulness, influence of others. <b>Impediments:</b> cost.
<i>Tan and Chou (2008)</i>	<b>Drivers:</b> Perceived gaming possibilities, quality of content, quality of mobile phone services, feedback, perceived technological compatibility, perceived usefulness, perceived ease of use, personalisation, variety, Mobile service quality
<i>Kim et al. (2008)</i>	<b>Drivers:</b> System quality, Social influence, ubiquitous connectivity, perceived usefulness, perceived ease of use, compatibility, perceived value. <b>Impediments:</b> perceived cost.
<i>Chen (2008)</i>	<b>Drivers:</b> perceived convenience of the transaction, perceived speed of the transaction, security and privacy concerns, perceived usefulness, perceived ease of use, compatibility. <b>Impediments:</b> perceived risk.
<i>Khalifa and Shen (2008)</i>	<b>Drivers:</b> privacy problems, efficiency, perceived security, perceived convenience in the transaction, Subjective norms, behavioural control, attitude. <b>Impediments:</b> cost.
<i>Ha et al.(2007)</i>	<b>Drivers:</b> flow experience, perceived attractiveness, perceived lower sacrifices, perceived ease of use, perceived appeal, attitude, perceived usefulness, perceived enjoyment.
<i>Turel et al. (2007)</i>	<b>Drivers:</b> perceived value, intention of use, actual use
<i>Kim et al. (2007)</i>	<b>Drivers:</b> usefulness, enjoyment, perceived value. <b>Impediments:</b> technical aspects, perceived fee.
<i>Hsu et al (2007)</i>	<b>Drivers:</b> relative advantage, perceived ease of use, compatibility, triability, image, visibility, result demonstrability, voluntariness.
<i>Mallat (2007)</i>	<b>Drivers:</b> relative advantage, compatibility, trust.

	<b>Impediments:</b> complexity of payment via mobile phone, cost, network externalities.
<i>Cyr et al. (2006)</i>	<b>Drivers:</b> perceived usefulness, design aesthetics of a mobile site, perceived ease of use, m-loyalty, perceived enjoyment.
<i>Pedersen (2005)</i>	<b>Drivers:</b> user friendliness attitude, self control, subjective norm, self-efficacy, facilitating conditions, behavioral control, usefulness, behavioural control, interpersonal influence, external influence.
<i>Yang (2005)</i>	<b>Drivers:</b> specialisation, technology cluster, attitude, perceived usefulness, perceived ease of use, innovativeness, previous acceptance behaviour, knowledge.
<i>Gilbert and Han (2005)</i>	<b>Drivers:</b> innovativeness, intention of use, image, perceived enjoyment, facilitating conditions, subjective norms, influence of others, interpersonal influence.
<i>Nysveen et al. (2005)</i>	<b>Drivers:</b> attitude, perceived expressiveness, perceived enjoyment, normative pressure, perceived ease of use, perceived usefulness, behavioural control.
<i>Bruner (2005)</i>	<b>Drivers:</b> consumer visual orientation, perceived entertainment, perceived usefulness, attitude, perceived ease of use.
<i>Wu and Wang (2004)</i>	<b>Drivers:</b> perceived usefulness, intention of use, perceived ease of use, compatibility. <b>Impediments:</b> cost, , perceived risk
<i>Pagani (2004)</i>	<b>Drivers:</b> speed of use, perceived ease of use, perceived usefulness, relative advantage. <b>Impediments:</b> price
<i>Teo and Pok (2003)</i>	<b>Drivers:</b> relative advantage, perceived ease of use, compatibility, self-efficacy, government's satisfaction, image., subjective norm, perceived behavioural control, influence of others, mobile operator's facilitation. <b>Impediments:</b> perceived risk.

**Table 6.**

Impediments and drivers to engage in m-shopping

Factor	IMPEDIMENTS TO M-COMMERCE	Factorial load	Factor	DRIVERS TO M-COMMERCE	Factorial load
F1: Lack of relations	Lack of personal relations	0.866	F1: Convenience	Greater number of shopping hours	0.790
	Lack of contact with others	0.769		Chance to buy anywhere	0.710
	No chance to see, try, smell,...	0.677		Convenience	0.636
	Problems returning the product	0.583		Speed of purchase	0.629
	Lack of personal attention	0.492		Makes shopping easy for the disabled	0.608
F2: Problems using the mobile	Complications using the mobile	0.859	F2: Company performance	Advertising/attractive appearance	0.748
	Complicated pages or interfaces for shopping	0.797		The firm sells through other media	0.680
	Technical problems with the connection	0.590		Buyer-seller interaction	0.639
	Small screens	0.569		Reputation of the firm	0.603
	Limited user knowledge of mobiles	0.329		Reliable information	0.530
F3: Transaction costs	Shipping costs	0.783	F3: Marketing-mix	Ample information	0.405
	Costs of sms, mms	0.779		Wide range of products	0.780
	Concerns regarding safe payment	0.425		Special offers and discounts	0.709
F4: Product related	Need to plan the purchase	0.798	F4: Special advantages	Lower prices	0.699
				Access to special products	0.629
	Expiry date	0.573		Safe payment	0.748
				Easy to pay	0.568
			Enjoyable	0.495	
			Less risk of impulse buying	0.449	
			Less stress	0.443	

**Table 7.**

Cluster analysis. Final centres of conglomerates and ANOVA analysis

	User groups				F	Sig.
	Relational	Transferred	Inexperienced	Indifferent		
<i>Convenience</i>	0.3547	0.2484	-0.1678	-0.4465	12.564	0.000
<i>Company performance</i>	-0.8172	0.8396	-0.2262	-0.1079	64.422	0.000
<i>Marketing-mix</i>	0.8567	-0.2364	-0.3483	0.0794	30.329	0.000
<i>Special advantages</i>	-0.2635	-0.7116	0.6046	0.2619	50.136	0.000
<i>Lack of relations</i>	0.2178	-0.0105	0.1148	-0.3450	5.032	0.002
<i>Problems using the mobile</i>	-0.5861	0.2621	0.6898	-0.6927	61.231	0.000
<i>Transaction costs</i>	0.8333	0.3156	0.0955	-1.1052	90.202	0.000
<i>Product-related problems</i>	-0.4614	-0.0510	0.1806	0.1455	6.739	0.000

**Table 8.**  
Multigroup analysis. Identical coefficients in the four groups

<i>Causal relation</i>	$\lambda$	<i>t</i>	$R^2$
EASE to UTI	<b>0.365</b>	<b>6.782</b>	0.316
SUBJNORM to UTI	<b>0.416</b>	<b>8.490</b>	
EASE to ATTI	<b>0.306</b>	<b>5.042</b>	0.299
USE to ATTI	<b>0.414</b>	<b>7.101</b>	
CONTROL to EASE	<b>0.471</b>	<b>9.201</b>	0.273
ATTI to INTEN	<b>0.403</b>	<b>8.124</b>	
PERCON to INTEN	0.0342	0.684	0.387
SUBJNORM to INTEN	<b>0.435</b>	<b>8.397</b>	
Goodness of fit indices	$\chi^2 = 2245.78$ (P = 0.000); CFI = 0.912; RMSEA = 0.08		
<i>Relational users</i>	Contribution to $\chi^2 = 47.074$ (21.05%) RMR = 0.09 GFI = 0.913		
<i>Transferred users</i>	Contribution to $\chi^2 = 75.178$ (33.62%) RMR = 0.09 GFI = 0.913		
<i>Inexperienced users</i>	Contribution to $\chi^2 = 52.627$ (23.54%) RMR = 0.08 GFI = 0.920		
<i>Indifferent users</i>	Contribution to $\chi^2 = 48.699$ (21.79%) RMR = 0.09 GFI = 0.912		

**Table 9.**

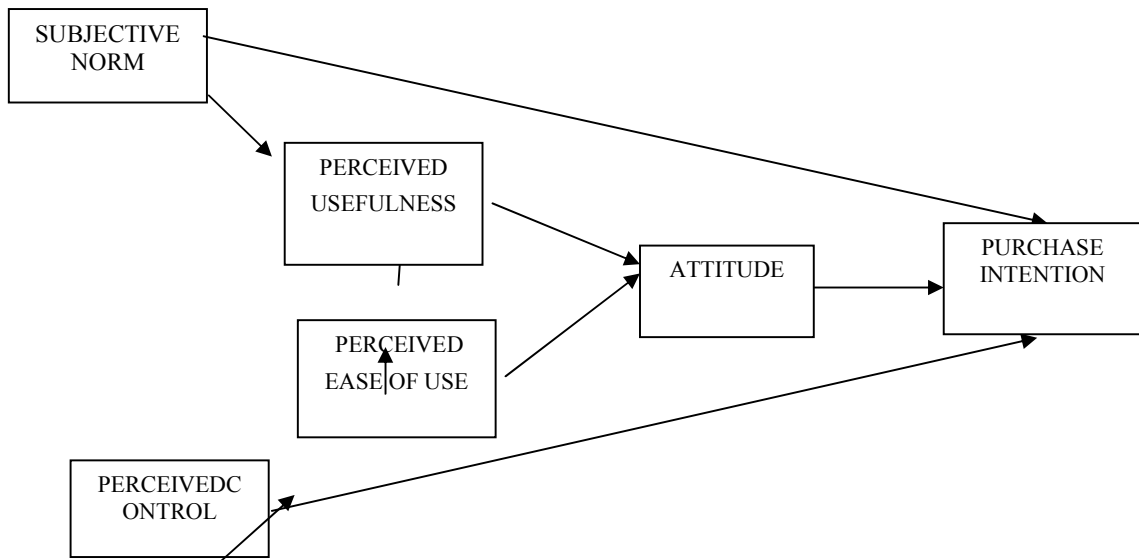
Multigroup analysis. Different coefficients in the four groups

	<i>Relational users</i>		<i>Transferred users</i>		<i>Inexperienced users</i>		<i>Indifferent users</i>	
	$\lambda$ (t)	R <sup>2</sup>	$\lambda$ (t)	R <sup>2</sup>	$\lambda$ (t)	R <sup>2</sup>	$\lambda$ (t)	R <sup>2</sup>
EASE to UTI	<b>0.377 (3.056)</b>	0.231	<b>0.375 (3.854)</b>	0.232	<b>0.355 (3.612)</b>	0.431	<b>0.331 (3.073)</b>	0.404
SUBJNORM to UTI	<b>0.247 (2.248)</b>		<b>0.247 (2.838)</b>		<b>0.585 (6.712)</b>		<b>0.548 (5.297)</b>	
EASE to ATTI	0.223 (1.508)	0.259	<b>0.223 (1.905)</b>	0.259	<b>0.388 (3.616)</b>	0.301	<b>0.336 (2.794)</b>	0.381
UTI to ATTI	<b>0.445 (2.930)</b>		<b>0.444 (3.701)</b>		<b>0.327 (3.453)</b>		<b>0.497 (4.280)</b>	
CONTROL to EASE	<b>0.440 (3.733)</b>	0.248	<b>0.439 (4.706)</b>	0.248	<b>0.462 (5.058)</b>	0.266	<b>0.554 (5.058)</b>	0.343
ATTI to INTEN	<b>0.408 (3.522)</b>	0.567	<b>0.407 (4.450)</b>	0.567	<b>0.316 (3.539)</b>	0.567	<b>0.475 (4.717)</b>	0.567
CONTROL to INTEN	-0.121 (-1.067)		-0.121 (-1.347)		<b>0.204 (2.290)</b>		0.157 (1.491)	
SUBJNORN to INTEN	<b>0.450 (3.875)</b>		<b>0.449 (4.888)</b>		<b>0.485 (5.333)</b>		<b>0.293 (2.187)</b>	
Goodness of fit indices for each group	Contribution to $\chi^2 = 46.634$ (21.18%) RMR = 0.009 GFI = 0.901		Contribution to $\chi^2 = 74.33$ (33.76%) RMR = 0.008 GFI = 0.911		Contribution to $\chi^2 = 7.930$ (26.58%) RMR = 0.023 GFI = 0.983		Contribution to $\chi^2 = 1.237$ (4.14%) RMR = 0.018 GFI = 0.997	
Global goodness of fit indices	$\chi^2 = 2205.2$ (p = 0.0); CFI = 0.920; RMSEA = 0.07							

FIGURES

**Figure 1.**

Proposed model



**Figure 2.**

Estimated overall model

