BASE – Revista de Administração e Contabilidade da Unisinos
15(3):238-253, julho/setembro 2018
Unisinos - doi: 10.4013/base.2018.153.06

THE E-CONSUMER IN LIGHT OF THE PERCEIVED VALUE THEORY: A STUDY ON THE ACCEPTANCE OF *MOBILE COMMERCE*[1]

***O E-CONSUMIDOR À LUZ DA TEORIA DO VALOR PERCEBIDO: UM ESTUDO SOBRE A ACEITAÇÃO AO* MOBILE COMMERCE**

DAYVISSON EMANOEL SILVA DE SOUZA[2]
Universidade Federal da Paraíba
dayvissonsouza@live.com

RENATA F. BALDANZA[2]
Universidade Federal da Paraíba
renatafrans@yahoo.com.br

ABSTRACT

With the advancement of technologies and devices such as smartphones that allow connection to the internet, other forms of online consumption have emerged. E-commerce, once defined as a computer-mediated trading market, has turned into mobile commerce, or m-commerce, an abbreviated form of the term. However, not all consumers are willing to adopt this new format to consume products and services. The consumer tends to have the intention to consume products and services in which he or she perceives added value in the exchange process. Therefore, this study sought to analyze the antecedent factors of the perceived value and how these factors influence the intention to purchase m-commerce via cell phones. In methodological terms, the data collection was performed through the application of online questionnaires with the help of the Google Forms tool, with 452 of the questionnaires being validated. Constructs from Theories and Models of acceptance of technology are viewed in this study as the prism through which to analyze the acceptance of m-commerce by consumers. Moreover, they are the predictors for the perceived value. The results showed that the constructs perceived utility, perceived ease of use, relative advantage, compatibility, pleasure, and perceived security have a direct influence on the perceived value.

Keywords: smartphones, e-consumer, m-commerce, perceived value.

RESUMO

Com o avanço de tecnologias e dispositivos como *smartphones* que permitem conexão com a internet, outras formas de consumir *online* emergiram. O *e-commerce*, que antes era definido como um mercado de trocas mediado por computador, transforma-se no *mobile commerce*, ou *m-commerce*, uma forma abreviada do termo. Todavia, nem todos os consumidores estão dispostos a adotarem esse novo formato de consumir produtos e serviços. O consumidor tende a ter a intenção em consumir produtos e serviços nos quais ele percebe valor agregado na relação de troca. Nessa direção, este estudo buscou analisar os fatores antecedentes do valor percebido, e como esse influencia a intenção de compra no *m-commerce* por intermédio de telefones celulares. Em termos metodológicos, a coleta de dados se deu por meio da aplicação

[1] Acknowledgment: Conselho Nacional de Desenvolvimento Científico e Tecnológico – CNPq.
[2] Universidade Federal da Paraíba. Cidade Universitária, s/n, Castelo Branco III, 58051-085, João Pessoa, PB, Brasil.

de questionários *online* com o auxílio da ferramenta Google Forms, sendo validados 452 deles. Constructos de teorias e modelos de aceitação de tecnologia são vistos neste estudo como o prisma através do qual se analisa a aceitação do *m-commerce* pelos consumidores. Além disso, eles são os preditores do valor percebido. Os resultados mostraram que os construtos utilidade percebida, facilidade de uso percebida, vantagem relativa, compatibilidade, prazer e segurança percebida têm influência direta sobre o valor percebido.

Palavras-chave: *smartphones*, *e-consumidor*, *m-commerce*, valor percebido.

INTRODUCTION

Mobile communication technologies have become embedded in social groups in the last two decades. Likewise, due to the popularization of the internet, companies have created new consumption spaces for their clients on the internet in addition to traditional physical space. Other companies have been created in this environment and do not have a physical alternative for consumption; they are only present *online*. In this context, consumer behavior studies have begun to investigate this new environment and how consumers react to the stimuli created in it (Pappas *et al.*, 2016).

With the constant evolution of technology and devices that allow us to connect to the internet, other means of connecting to the network and consuming *online* have emerged recently, such as *smartphones* and *tablets*. In this new context, *e-commerce*, formerly defined as a computer-mediated exchange market, becomes *mobile commerce*, or *m-commerce*, an abbreviated form of the term. There are some reasons why marketers should be aware of consumers' use of mobile devices; for example, the device is always with users wherever they go; mobile devices are always available for communication; and mobile devices are a form of one-on-one contact that holds more attention than traditional forms of contact (Oztas, 2015).

However, not all consumers are willing to adopt this new way of consuming products and services. The consumer tends to have the intention to consume products and services in which he or she perceives added value in the exchange process. The present research encompasses this discussion in which the perceived value of *m-commerce* influences its adoption.

The adoption of perceived value is determined by a ratio between the perceived benefits and the sacrifices required when using some technology or innovation (Dodds *et al.*, 1991). However, how is perceived value formed, and what are the antecedents for it in the context of *m-commerce*? To answer this question, this study uses models and theories of technology acceptance. These models have several constructs that, according to what is formulated later in the work, have a direct influence on the value perceived by individuals.

One of the first models of acceptance of the studied technology is the Technological Acceptance Model (TAM; Davis, 1989), from which the antecedents perceived utility and perceived ease of use were extracted; these factors are understood to have a direct positive influence on the perceived value for individuals. Additionally, other antecedent variables are considered in the study as factors that positively influence the perceived value: relative advantage and compatibility (from Innovation Diffusion Theory – IDT; Rogers, 1995), facilitating conditions (from the Unified Theory of Acceptance of Use of Technology – UTAUT; Venkatesh *et al.,* 2003), pleasure (from the Consumer Acceptance of Technology model – CAT; Kulviwat *et al.,* 2007) and perceived security. The antecedents that are considered to negatively influence perceived value are complexity (from IDT) and perceived cost (from the Value-based Adoption Model – VAM; Kim *et al.,* 2007).

The theme of the research was chosen based on some aspects. According to data from Anatel, Brazil ended December 2016 with a total of 244.1 million cell phones nationwide (http://www.teleco.com.br/ncel.asp). That is, for every 100 Brazilians, there are 118.04 cell phones. The TIC Domicílios 2014 (http://www.cetic.br/tics/domicilios/2014/domicilios/) survey, conducted between October 2014 and March 2015, indicates that 47% of users use their cell phones to connect to the Internet in Brazil, which is equivalent to 81.5 million people. That number in 2011 was only a third of the current figure.

The current possibilities that a cell phone connected to the internet provides are diverse: it provides constant communication with peers, anywhere and at any time, given the increase in the infrastructure in mobile internet, and people can listen to music, watch videos, play *online* games, and enjoy other forms of entertainment. Moreover, through applications and websites with a unique interface for mobile devices, you can buy products or enjoy services offered by companies from the mobile device. Therefore, this research is relevant in providing a panorama of what adds value to consumers in the context of *m-commerce*, in addition to relating perceived value with the intention to adopt the new platform.

Thus, important insights on how to increase the perceived value of mobile device users in the context of *m-commerce* will be available to marketers and field researchers. This research is timely given the effervescence of the market since in the

last two years, the growth of this new e-commerce model has reached a significant level.

Because there are positive and negative antecedent factors that corroborate the formation of perceived value and because this perceived value will directly impact the intention to adopt *m-commerce*, the following research problem is presented: *'what are the antecedents for perceived value, and how does this influence the intention to purchase in m-commerce through mobile phones?* To resolve this question, the guiding objective is to '*analyze the antecedent factors of perceived value and how they influence the intention to purchase in m-commerce via mobile phones'.*

THEORETICAL FOUNDATION

MOBILE MARKETING EMOBILE COMMERCE

Mobile communication devices are so ubiquitous that there are more people with mobile devices than with toothbrushes in the world (MMA Asia, 2011). In response to this trend, marketers are significantly increasing the use of mobile devices to meet the demands of mobile consumers. Data from eMarketer (2015) show us that mobile business spending now accounts for one-quarter of overall digital spending.

In fact, innovative mobile technologies deliver new tools (applications) that make it possible to separate time of purchase and the time of actual consumption by allowing consumers to make a purchase from a mobile device and collect the product at home or in the store, in addition to the traditional model of purchase and consumption in the store (Pantano and Priporas, 2016).

Although the use of *mobile* in marketing has grown dramatically, research on this topic has evolved gradually. Studies have focused on issues such as *mobile marketing* (Shankar and Balasubramanian, 2009), delivery of mobile services (Kleijnen *et al.*, 2007), use of the mobile interface and usability (Venkatesh *et al.*, 2012), the mobile navigation experience (Adipat *et al.*, 2011), applications for sales (Shankar *et al.*, 2010), interfaces for mobile devices (Brasel and Gips, 2014), demand for mobile applications (Garg and Telang, 2012), mobile advertising and promotions (Andrews *et al.*, 2015; Fong *et al.*, 2015), and purchases via mobile devices (Wang and Sun, 2016).

For Shankar *et al.* (2016), the term *mobile* encompasses several aspects, including device, medium, technology, and channel. Device refers to the device, such as a *smartphone*, *tablet*, and *notebook*. The medium is about the media, such as applications, email, and print. Technology is the *hardware* and *software* behind communication, such as fixed broadband and wireless broadband. The channel concerns the transaction mode, such as *mobile*, *desktop*, phone, and physical store. All these factors affect *mobile marketing.*

Mobile marketing can be seen as an evolution of *e-commerce,* in which traditional internet based marketing shifted to the *mobile* channel in response to the emerging trend of consumers losing interest in traditional marketing channels (Hinz *et al.,* 2011). For Maduku *et al.* (2016), *mobile marketing* is a set of marketing practices that uses mobile technologies and wireless networks to create interactive and personalized communication between the organization and its target audience, resulting in the creation of value for both parties in this ubiquitous environment.

When *mobile marketing* meets *online* retail via mobile devices, there is *mobile commerce*. *Mobile commerce* is a growing format involving mobile computing technologies, with growing popularity and significant potential (Nilashi *et al.,* 2015). In this scenario, mobile devices (e.g., *smartphones*, *tablets,* etc.) are becoming essential on a daily basis, making communication more convenient (Dinh *et al.*, 2013; Wong *et al.*, 2015) and allowing for various types of mobile services such as *SMS*, *MMS*, *GPS*, mobile payment, and *mobile banking* (Hsiao and Chen, 2015) and the emergence of sales and related platforms with exclusive advantages, mainly via applications and e-commerce sites with mobile versions, among others.

The use of these mobile devices in *m-commerce* corroborates the formation of two central features in this platform, which are ubiquity and location. These aspects are not found in *e-commerce*; thus, companies are able to connect with consumers anytime, anywhere (Huang *et al.*, 2015).

Because of the monetary transactions that occur in *mobile commerce*, the main influencing factors for consumer acceptance are related to risk aversion, which include trust in the transaction, privacy concerns, and network security (Grob, 2015; Ng, 2016). These aspects are included in the perceptions of the probability of acceptance of the *m-commerce* format by people and potential consumers. Therefore, the next section addresses the theories and models most commonly used in research to understand consumer acceptance of technologies.

THEORIES AND MODELS FOR TECHNOLOGY ACCEPTANCE

Here are the theories and models that this research adopts as the antecedents constructs of perceived value.

TECHNOLOGY ACCEPTANCE MODEL (TAM)

The Technology Acceptance Model (TAM) was designed by Davis (1989) to specifically apply to computer-related behavior by incorporating findings accumulated over more than a decade into information systems. It can be used to model computational acceptance.

The work of Davis (1989) aimed to develop and validate new scales for two specific variables: perceived utility and perceived ease of use. These two variables were tested as fundamental determinants of user acceptance.

In his article that gave rise to the TAM, Davis asks what makes an individual accept or reject an information technology. For him, among the several variables that can influence the use of the systems, two are particularly important. First, people tend to use or not use an application insomuch as they believe that the application will help them to better perform their activities. He referred to this first variable as perceived utility. However, even if a potential user believes that a given application is useful, he may simultaneously believe that the system is too difficult to use, and thus, the benefits are outweighed by the effort required to use it.

The TAM is widely used today (Pando-Garcia *et al.*, 2016; Wang and Sun, 2016; Abdullah *et al.*, 2016; Agag and Masry, 2016). Although there is extensive empirical support for the TAM, it does not fully explain all aspects of technology adoption. Recent studies show that technology adoption can be highly motivated by other factors that are not part of the traditional components of the TAM, such as the perceived subjective adoption of monetary and non-monetary costs (Chen and Dubinsky, 2003; Kim *et al.*, 2007) or social influence (SI) by others, such as friends or family members (Kwon and Chon, 2009). Thus, the following theories seek to fill some of the gaps left by the TAM.

INNOVATION DIFFUSION THEORY (IDT)

Innovation Diffusion Theory (IDT) (Rogers, 1995) has been commonly applied to new technologies and services to predict their adoption. IDT proposes that within a population group, innovations are not adopted simultaneously by all individuals. The theory argues that the rate of innovation adoption of individuals is determined by a wide variety of personal (gender, ethnicity, age), social (education, social class) and technological (utility and perceived benefits) factors (Leung and Wei, 1999).

IDT assumes that some people are more willing to test innovative ideas and technologies than others. Rogers (1995) argues that sociodemographic factors such as gender, age, education, and income can identify when individuals will adopt innovative ideas or technologies. He categorized individuals into five categories of adopters: innovators, initial adopters, initial majority, late majority, and latecomers (Kim *et al.*, 2014).

Rogers (2003) defines the four main factors for the diffusion of new ideas: (1) innovation, (2) communication channels, (3) time, and (4) the social context. Of these four factors, we will address the first. Despite advancing in some directions, the IDT-based adoption model is still fragile because it takes into account only utilitarian reasons, leaving aside symbolic and social aspects.

UNIFIED THEORY OF ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) was designed to unify the various existing theories about how users accept technology (Venkatesh and Morris, 2000; Venkatesh *et al.*, 2003). The UTAUT is created from the following eight widely used theories: Theory of Rational Action (TRA) by Davis *et al.* (1989); the Technology Acceptance Model (TAM) by Davis (1989); the Motivation Model (MM) by Davis *et al.* (1992); Theory of Planned Behavior (TPB) and Combined TAM and TPB (C-TAM-TPB) by Taylor and Todd (1995); the Model of PC Utilization (MPCU) by Thompson *et al.* (1991); Innovation Diffusion Theory (IDT) by Moore and Benbasat (1991); and Social Cognitive Theory (SCT) by Compeau *et al.* (1999).

Based on the combination of these eight theories, the UTAUT model explains the behavioral intention to use or adopt the technology, proposing four predictive determinants (Venkatesh *et al.*, 2003): expected performance, expected effort, social influence, and facilitating conditions. Venkatesh *et al.* (2003) also identified four major moderators that may affect the relationship between the main determinants and intent: gender, age, experience, and willingness.

CONSUMER ACCEPTANCE OF TECHNOLOGY MODEL (CAT)

As the main objective of his work, Kulviwat *et al.* (2007) incorporated the PAD (*Pleasure*, *Arousal*, and *Dominance*) emotions paradigm (Mehrabian and Russell, 1974) for the Technology Acceptance Model (Davis, 1989), which is the most popular model used to predict the adoption of technology. An additional goal was to improve the concept of cognition by adding a key belief, relative advantage, which involves the extent to which an innovation is superior compared to alternatives. He considers that the CAT model is more powerful in describing and predicting adoption by the consumer.

Kulviwat *et al.* (2007) sought to improve the TAM with the proposal of the CAT model, which adds an affective dimension of emotion to the models of technology acceptance, thus conferring greater explanatory power.

VALUE-BASED ADOPTION MODEL (VAM)

Value is a construct strongly emphasized in the field of economics, and it has its foundation in theories of exchange, utility, and value of work, and in marketing, accounting, and finance, with roots in psychology and social psychology as well (Kim *et al.,* 2007). Researchers have already assigned several terms to define value, generally differentiating the context from the same basic concept: value of consumption (Sheth *et al.*, 1991), value of acquisition and transaction (Thaler, 1985), service value and customer value (Woodruff, 1997), consumer value (Holbrook, 1999), and perceived value (Zeithaml, 1988).

For Kim *et al.* (2007), modeling the perceived value of a product solely based on its price is important but insufficient. Most of the time, consumers consider factors other than price, such as the perceived quality of the product. The most simplistic *trade-off* models ignore the multidimensionality of the

decision-making process and do not fully represent perceived benefits and sacrifices. Thus, Kim *et al.* (2007) proposed the Value Based Adoption Model (VAM), which aims to fill *gaps* that still exist in previous models.

The study by Kim *et al.* (2007) was shown to be more effective using the VAM model to explain the adoption of the mobile internet by consumers (context researched in the article) than the traditional TAM. The next topic of this work will address the constructs that are part of the theories and models discussed here, which are better suited to the context of *mobile commerce* and which constitute antecedents of perceived value.

Table 1 shows a comparison among the theories discussed.

The studied theories have similarities with each other. However, over time, new constructs have been included in the theories of technology acceptance. In 1989, TAM established the constructs perceived utility and perceived ease of use as predictors of attitude, and this attitude reflects on behavioral intent that influences actual use. Six years later, IDT brought the constructs relative advantage, which at some level is related to the perceived utility from TAM; compatibility; complexity, which is similar to the perceived ease of use also from the TAM model; experimentability and observality as predictors of adoption.

Despite advancing in the field with new constructs, IDT still focused more on utilitarian aspects, leaving aside symbolic and sociodemographic ones. In 2003, the UTAUT brings as new constructs to the theories of technology acceptance the social aspect, through the construct social influence, and also for the first time takes into account demographic aspects as moderators. CAT is presented in 2007, and differs from previous ones by bringing an emotional dimension to the model, which is composed of three constructs (pleasure, excitement and domain).

Still, also in 2007, VAM is the first model that brings the construct perceived value to a technology acceptance model. It is presented as a predictor of the intention to adopt the technology. And it is in this way that the model of this current research is based. Perceived value is discussed more comprehensively in the following section.

ANTECEDENTS OF PERCEIVED VALUE

In this section, the constructs that are part of the theories and models discussed in the past topic (TAM, IDT, UTAUT, CAT and VAM) will be approached. The ones which in some way are adequate to the reality of mobile commerce with regard to consumer acceptance and that are understood as antecedents, that have a direct influence on the perceived value.

The constructs discussed forward are perceived utility and perceived ease of use (TAM), relative advantage, compatibility and complexity (IDT), facilitating conditions (UTAUT), pleasure (CAT) and perceived cost (VAM).

PERCEIVED UTILITY

Perceived utility is one of the most studied variables when it comes to technology adoption (Jeyaraj *et al*., 2006). For Davis (1989), perceived utility is defined as the degree to which a person believes that using a particular system would increase their performance in their activities. Based on the exposed, the first research hypothesis is elaborated:

H1: Perceived utility positively influences perceived value.

Table 1. *Comparison among theories.*

Theory	Constructs
Technology Acceptance Model (TAM)	Perceived utility; perceived ease of use; attitude; behavioral intention; actual use.
Innovation Diffusion Theory (IDT)	Relative advantage; compatibility; complexity; experimentability; observality; adoption.
Unified Theory of Acceptance and Use of Technology (UTAUT)	Performance expectation; effort expectation; social influence; facilitating conditions; gender; age; experience; willingness; intention of use; use behavior.
Consumer Acceptance of Technology Model (CAT)	Relative advantage; perceived utility; perceived ease of use; pleasure; excitement; domain; attitude; intention of adoption.
Value-Based Adoption Model (VAM)	Utility; pleasure; technology, perceived cost; perceived value; intention of adoption.

Source: Prepared by the authors, based on the models (2017).

PERCEIVED EASE OF USE

Perceived ease of use refers to the degree to which a person believes that using a particular system would be completely effortless (Davis, 1989). As perceived utility, perceived ease of use is one of the variables found in the original TAM model. In face of what had been discussed, the second research hypothesis is formulated:

H2: Perceived ease of use positively influences perceived value.

THE RELATIVE ADVANTAGE

The relative advantage is a construct of the IDT adoption model. For Rogers (2003), relative advantage is the degree to which a person perceives that the new technology is better than the one it replaces. From this discussion, the third hypothesis of research is drawn:

H3: Relative advantage positively influences perceived value.

COMPATIBILITY

As the relative advantage, compatibility is also a construct borrowed from IDT. Rogers (2003) defines it as the degree to which an innovation is perceived to be consistent with the values, past experiences, and needs of potential adopters. The lack of compatibility in information technology with the needs of the individual can negatively affect the use of technology (Mckenzie, 2001). Considering what was discussed, the fourth research hypothesis is elaborated:

H4: Compatibility positively influences perceived value.

COMPLEXITY

Complexity is also an IDT construct. Rogers (2003) defines it as the degree to which an innovation is perceived relatively difficult to understand and use. In contrast to the other constructs, complexity is negatively related to the adoption rate. Thus, the fifth research hypothesis is formulated:

H5: Complexity negatively influences perceived value.

FACILITATING CONDITIONS

Facilitating conditions is a construct that comes from the UTAUT model (Venkatesh *et al.*, 2003). They refer to the degree to which the individual considers that there are technical and organizational conditions that help facilitate the use of technology (Konrad *et al.*, 2015). In view of the discussion, the sixth research hypothesis is drawn:

H6: Facilitating conditions positively influence perceived value.

PLEASURE

Pleasure is a construct that constitutes the emotional dimension in CAT (Kulviwat *et al.*, 2007). The pleasure was discovered as a strong factor of positive influence on the attitude towards shopping on the internet (Lee *et al.*, 2003) and when operationalized as fun, it has a direct positive effect on the attitude toward the use of mobile devices (Bruner and Kumar, 2005). Thus, the seventh research hypothesis is elaborated:

H7: Pleasure positively influences perceived value.

PERCEIVED SECURITY

According to Vatanasombut *et al.* (2008), perceived security is defined as the perception that people have that interactions on any platform are secure. Woodwall (2003) identified the perception of risk as a determining factor for the perception of value and the identification of benefits in the intentions of purchase. Thus, the eighth research hypothesis is formulated:

H8: Perceived security positively influences perceived value.

PERCEIVED COST

The perceived cost is a construct derived from the sacrifice dimension of the VAM model (Kim *et al.*, 2007). It symbolizes the encoding or internalization of the target price of a product or service (Jacoby and Olson, 1976). And marketing studies show that perceived monetary value and perceived value are negatively related (Chang and Wildt, 1994). Thus, the ninth hypothesis of research is drawn:

H9: Perceived cost negatively influences perceived value.

PERCEIVED VALUE

From the consumer perspective, obtaining value is a substantial consumption goal in a successful buying experience (Davis and Hodges, 2012). For Schechter (1984), perceived value is composed of quantitative and qualitative factors, objective and subjective, which together form the buyer's experience. Dodds *et al.* (1991) defines perceived value as the ratio between perceived benefits and perceived sacrifices. Woodruff and Gardial (1996) define perceived value as a *trade-off* of desirable attributes and attributes of sacrifice.

However, the widely accepted definition of perceived value is found in Zeithaml (1988), who stated that consumers define value in four ways: value is (1) low price, (2) what I want in a product, (3) quality proportional to the price paid, and (4) what I get for what I give. He still synthetically conceptualized the perceived value as the overall appreciation of the consumer for the utility of a product or service,

determined by the consumer's perception of what is given and what is received.

This value can be increased both by improving benefits for the individual and by reducing the costs of buying and using the good or service (Lovelock and Wirtz, 2011). Perceived value is commonly assessed by the relationship between quality and price, where it increases if the quality increases or if the price falls. However, the valuation of the total value is not based solely on price and quality. Previous studies have suggested several types of value: functional, social, emotional, epistemic, and conditional (Hsiao and Chen, 2016).

However, apparently only two types of value are more applicable to consumer behavior studies. The first refers to the functional motives, which includes more tangible needs such as price, convenience, and quality. The second is related to non-functional motives, which are more linked to intangible desires, such as emotional and social needs (Chen and Hu, 2010). Perceived value still influences the intention to buy (Li and Petrick, 2008; Tuškej *et al.*, 2013).

Therefore, the last research hypothesis is proposed:

H10: Perceived value positively influences the adoption of m-commerce.

From the triad '*m-commerce*', 'technology acceptance theories', and the pillars of 'perceived value', we constitute the theoretical principles guiding this article.

METHODOLOGICAL PROCEDURES

Here, we present the research model, the hypotheses derived from it, the manner in which the variables were measured, and the data collection and organization procedure.

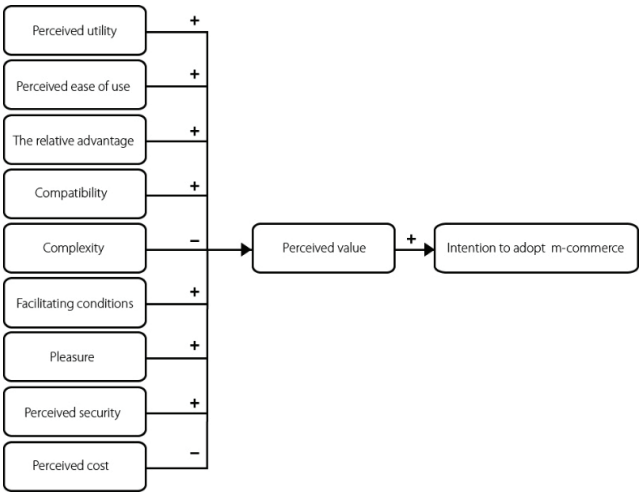

Figure 1. *Research model.*

Source: Prepared by the authors, based on the models used (2017).

Figure 1 shows the research model, whose variables are derived from the used models.

These constructs are considered as antecedents to the perceived value and, in this research, the perceived value is considered a direct influence on the intention to adopt *m-commerce*. From the model described, ten research hypotheses were drawn. The details of each are shown in Table 2.

The measurement of the constructs was performed through the application of scales already validated in previous studies. All constructs followed the recommendation of Hair *et al.* (2014) to use at least three variables per construct to obtain a more reliable scale. The scales were translated from the original language into Portuguese, and the items were discussed in a research group to better fit the Brazilian context.

Table 2. *Research hypotheses.*

Hypotheses	Description
H1	Perceived utility positively influences perceived value.
H2	Perceived ease of use positively influences perceived value.
H3	The relative advantage positively influences the perceived value.
H4	Compatibility positively influences the perceived value.
H5	Complexity negatively influences perceived value.
H6	Facilitating conditions positively influence perceived value.
H7	Pleasure positively influences perceived value.
H8	Perceived security positively influences perceived value.
H9	Perceived cost negatively influences perceived value.
H10	Perceived value positively influences the intention to adopt m-commerce.

Table 3. *Results from psychometric analysis.*

Construct	KMO	Bartlett test	Lowest score	Variance	Cronbach's *alpha*
Perceived utility	0.816	X^2=1182.760;10gl;p=0.000	0.748	0.692	0.895
Perceived ease of use	0.616	X^2=292.354; 1 gl; p=0.000	0.668	0.631	0.708
Relative advantage	0.500	X^2=260.766; 1 gl; p=0.000	0.912	0.832	0.796
Compatibility	0.760	X^2=1176.469; 3 gl; p=0.000	0.928	0.887	0.936
Complexity	0.628	X^2=349.601; 3 gl; p=0.000	0.777	0.664	0.741
Facilitating conditions	0.5	X^2=111.251; 1 gl; p=0.000	0.857	0.744	0.637
Pleasure	0.739	X^2=999.666; 3 gl; p=0.000	0.903	0.857	0.916
Perceived security	0.855	X^2=1970.040; 6 gl; p=0.000	0.934	0.882	0.955
Perceived cost	0.5	X^2=86.718; 1 gl; p=0.000	0.842	0.709	0.585
Perceived value	0.832	X^2=1499.814; 6 gl; p=0.000	0.797	0.807	0.919
Adopt intention	0.729	X^2=807.466; 3 gl; p=0.000	0.886	0.822	0.891

Source: Study data (2017).

The data collection was conducted through the application of an *online* questionnaire with the help of the *Google Forms* tool. The collection had an application period of 10 days in 2016, during which the questionnaires were disseminated in social networks, specifically on Facebook, in the time line of the author of this research and of colleagues who shared.

At the end of the period, 459 questionnaires were collected and 452 were validated. The values were standardized in Z *outliers*, and because it was an exclusively *online* application, they did not have *missing values*. From then on, the analysis of the sample profile was performed, in which percentages and frequencies were verified.

After this step, we followed with a psychometric analysis of the research constructs. This analysis was performed by means of exploratory factorial analysis and extraction of Cronbach's *alpha* coefficient. Before applying the factorial analysis in the constructs, they were submitted to the KMO test and the *Bartlett* test of sphericity to verify the adequacy of the data for use of the technique (Table 3).

All the constructs were adequate, and the analysis allowed us to exclude from the constructs the problematic items that did not measure the dimension that the variable as a whole measured. Because the constructs were adequate, the phase of descriptive analysis and test of hypotheses - present in this article - were performed. The hypotheses were tested through Structural Equation Modeling (SEM), because it is a multivariate analysis model that allows the regression analysis of variables that are dependent and independent, simultaneously, on the same model. The analyses followed the recommendations of Hair *et al.* (2006) and Wilcox (2011) and were operationalized through R and SPSS software.

ANALYSIS OF RESULTS

SAMPLE TESTS

Regarding the sample, in terms of the sex of the individuals, a greater female (64.8%) representation was observed compared to males (35.2%), and for age group, the majority of the respondents were concentrated between 22 and 30 years of age (60%), with higher (55.1%) and postgraduate (40.9%) education levels. Most of them belonged to class B (IBGE, 2015), with 77% of the respondents being single, followed by married couples (21.2%).

Although there was not large heterogeneity in most sociodemographic variables, this does not affect the subsequent phases of analysis because the present research does not aim to generalize its results, but only to identify evidence of relationships among the studied constructs. To that end, the sample is adequate.

An exploratory analysis of the data noted that people who had previously made some purchase through a mobile phone presented averages that were different for the assertions that compose the constructs compared to those who never performed such purchases. Therefore, it was pertinent to investigate this behavior of the sample to verify whether the difference was only apparent or whether it was statistically significant. Table 4 shows the extractions of the tests performed.

The data in Table 4 show that the only constructs in which those who had previously made some purchase through the mobile phone had lower average values than those who had never previously bought anything were perceived complexity and perceived cost. In the remaining nine constructs, those who had previously made some purchase via mobile phones

had higher averages than those who had never bought anything. Next, the group of people who declared that they had previously made e-commerce purchases via mobile phones was analyzed, which included 52.7% (238) of the respondents. This analysis was chosen due to the inherent limit of the study structure because it would be impracticable to offer an extended discussion and because in directing, one can better point out the particularities of a specific group that tends to increase daily, which are Brazilian e-consumers who are potentially m-consumers.

HYPOTHESES TESTING

Two models were tested. The first one with all the data and the second only with the respondents who have already bought via m-commerce.

HYPOTHESES TESTING FOR THE GENERAL MODEL

The hypotheses were tested using Structural Equation Modeling. Table 5 shows the statistics for the initial general model.

These statistical data reveal that seven of the ten hypotheses traced were confirmed. Only the constructs complexity, facilitating conditions, and perceived cost had no influence on perceived value. This model obtained a R-squared coefficient (R^2), that is, percentage of the response construct variation that is explained by the antecedent constructs, of 61% for the influence of the constructs derived from the theories and models of technology acceptance in the perceived value, and of 50% for the influence of perceived value on the intention to adopt m-commerce. Although it was a good result, this model is not ideal, because it has constructs which hypotheses have

Table 4. *Analysis of the difference between means.*

Construct	Average		Anova	Kruskal-Wallis
	Already purchased	Never purchased		
Perceived utility	8.0	6.0	F = 149,900; p = 0.000	Chi-square = 109.291; 1gl; p = 0.000
Perceived ease of use	8.4	6.8	F = 99,415; p = 0.000	Chi-square = 78.913; 1gl; p = 0.000
Relative advantage	5.6	4.0	F = 63,768; p = 0.000	Chi-square = 55.733; 1gl; p = 0.000
Compatibility	7.0	4.1	F = 181,559; p = 0.000	Chi-square = 129.999; 1gl; p = 0.000
Complexity	2.9	3.7	F = 20,002; p = 0.000	Chi-square = 18.742; 1gl; p = 0.000
Facilitating conditions	7.3	6.8	F = 3,877; p = 0.05	Chi-square = 3.562; 1gl; p = 0.05
Pleasure	7.3	5.5	F = 75,568; p = 0.000	Chi-square = 75.496; 1gl; p = 0.000
Perceived security	7.3	5.6	F = 54,482; p = 0.000	Chi-square = 43.803; 1gl; p = 0.00
Perceived cost	5.2	5.1	F = 1,060; p = 304	Chi-square = 1.330; 1gl; p = 0.249
Perceived value	7.4	5.5	F = 92,340; p = 0.000	Chi-square = 78.071; 1gl; p = 0.000
Adopt intention	7.0	4.5	F = 114,966; p = 0.000	Chi-square = 90,758; 1gl; p = 0.000

Source: Study data (2017).

Table 5. *Initial general model.*

Hypotheses	Description	P-value	Beta	Decision
H1	Perceived utility → Perceived value	<0.001	0.259	Confirmed
H2	Perceived ease of use → Perceived value	0.017	0.099	Confirmed
H3	The relative advantage → Perceived value	0.015	0.102	Confirmed
H4	Compatibility → Perceived value	0.002	0.134	Confirmed
H5	Complexity → Perceived value	0.073	-0.068	Rejected
H6	Facilitating conditions → Perceived value	0.451	0.006	Rejected
H7	Pleasure → Perceived value	<0.001	0.162	Confirmed
H8	Perceived security → Perceived value	<0.001	0.211	Confirmed
H9	Perceived cost → Perceived value	0.439	0.007	Rejected
H10	Perceived value → Intention to adopt m-commerce	<0.001	0.706	Confirmed

Source: Study data (2017).

Table 6. *Final general model.*

Hypotheses	Description	P-value	Beta	Decision
H1	Perceived utility → Perceived value	<0.001	0.248	Confirmed
H2	Perceived ease of use → Perceived value	0.003	0.126	Confirmed
H3	The relative advantage → Perceived value	0.010	0.108	Confirmed
H4	Compatibility → Perceived value	0.004	0.123	Confirmed
H7	Pleasure → Perceived value	<0.001	0.174	Confirmed
H8	Perceived security → Perceived value	<0.001	0.219	Confirmed
H10	Perceived value → Intention to adopt m-commerce	<0.001	0.706	Confirmed

Source: Study data (2017).

been refuted. Thus, a final model (Table 6) was generated only with accepted hypotheses.

In this final model we can observe an increase in the betas of some constructs, such as the perceived ease of use, which now has a greater contribution to the perceived value. The R^2 remained at 61% and 50%.

HYPOTHESES TESTING FOR THE MODEL OF THOSE WHO HAVE ALREADY BOUGHT

As in the previous model, a structural equation modeling was also performed here to test the hypotheses. However, this model contains responses only from people who have already made purchases via mobile devices.

The results of the initial structural equation modeling reveal that perceived ease of use (p-value=0.357), complexity (p-value=0.312), facilitating conditions (p-value=0.455) and perceived cost (p-value=0.132) are constructs that have no influence on perceived value. This initial model obtained R^2 of 58.5% for the influence of the constructs derived from the theories and models of technology acceptance in the perceived value, and 42% for the influence of perceived value on the intention to adopt m-commerce.

A final model was generated, with the exclusion of constructs that did not show influence on the previous analysis. Statistical data can be found in Table 7.

In this final model, the R^2 for the influence of the constructs derived from the theories and models of technology acceptance in the perceived value was 56%, and 42% for the influence of perceived value on the intention to adopt m-commerce.

In the following section the results of hypotheses tests are discussed.

HYPOTHESES ANALYSIS

Table 8 presents a summary of the hypotheses test results, with ten research hypotheses, a description of each,

Table 7. *Final model of those who have already bought.*

Hypotheses	Description	P-value	Beta	Decision
H1	Perceived utility → Perceived value	0.001	0.188	Confirmed
H3	The relative advantage → Perceived value	0.013	0.142	Confirmed
H4	Compatibility → Perceived value	0.030	0.120	Confirmed
H7	Pleasure → Perceived value	<0.001	0.224	Confirmed
H8	Perceived security → Perceived value	<0.001	0.334	Confirmed
H10	Perceived value → Intention to adopt m-commerce	<0.001	0.647	Confirmed

Source: Study data (2017).

Table 8. *Summary of hypotheses test results.*

Hypotheses	Description		Decision	
	Predictive variable	Response variable	General model	Already bought model
H1	Perceived utility (+)	Perceived value	Confirmed	Confirmed
H2	Perceived ease of use (+)		Confirmed	Rejected
H3	The relative advantage (+)		Confirmed	Confirmed
H4	Compatibility (+)		Confirmed	Confirmed
H5	Complexity (-)		Rejected	Rejected
H6	Facilitating conditions (+)		Rejected	Rejected
H7	Pleasure (+)		Confirmed	Confirmed
H8	Perceived security (+)		Confirmed	Confirmed
H9	Perceived cost (-)		Rejected	Rejected
H10	Perceived value (+)	Intention to adopt	Confirmed	Confirmed

Source: Study data (2017).

their influence on the response variable (positive or negative), and the test results.

H1 to H9 are nine predictors of perceived value, which is the response variable. The first hypothesis (H1) to be formulated was that 'perceived utility positively influenced the perceived value' that people have about *m-commerce*. Corroborating with the works of Chong *et al.* (2012) and Faqih *et al.* (2015), the hypothesis was accepted, showing that it is a construct of great importance in the study of the perceived value of individuals regarding the use of mobile phones to make purchases and revealing that people believe that the use of this technology will yield better performance of their activities.

The second research hypothesis (H2), 'perceived ease of use positively influences perceived value', was rejected in the second model. This is not to say that people who have previously bought do not believe that *m-commerce* is easy to use. In the descriptive phase of the study, those who have previously bought something via a mobile phone have a significant mean in the perceived ease of use construct. One can interpret this result as follows: people who have had some experience with *m-commerce* perceive technology as being easy to use, but however much they find it easy to use, it is not this feature that makes them pursue value in *m-commerce*. Because they are already familiar with the technology, the simple fact that they do not have much difficulty in using it does not add to the perceived value because the use of technology is something very natural, and its ease does not become a factor of weight in the formation of perceived value.

The relative advantage construct contemplates the third research hypothesis (H3), which assumes that people will have a greater perception of perceived value, in that they believe *m-commerce* is a superior technology and better than its predecessors. The hypothesis was accepted. This result adds to the studies of Rogers (2003) and his theory of the diffusion of innovations.

The fourth research hypothesis to be launched (H4) was that 'compatibility influences perceived value'. This hypothesis

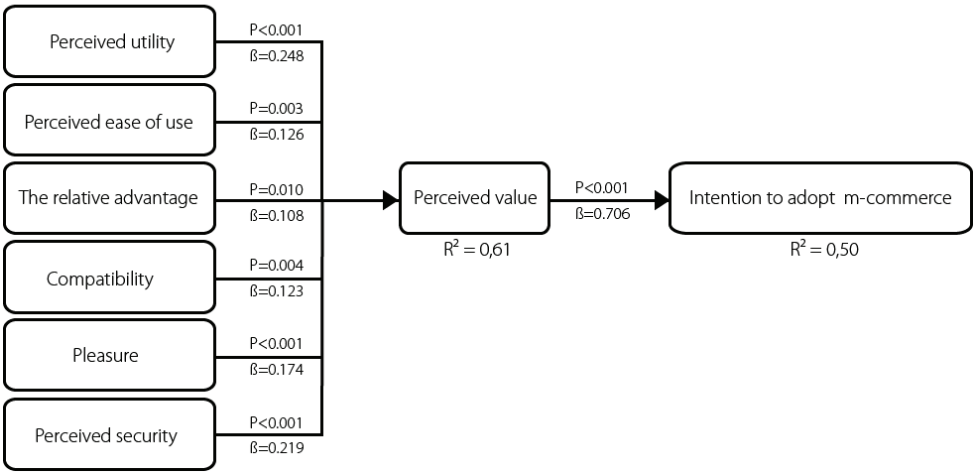

Figure 2. *Final model proposed from the empirical tests of the research.*

Source: Prepared by the authors, based on statistical tests (2017).

was accepted by showing that the degree of compatibility with the values, past experiences, and lifestyle that an innovation has, directly affects, in a positive way, the perceived value of individuals toward *m-commerce* (Agag and Masry, 2016).

The complexity construct is the fifth research hypothesis (H5), in which it is assumed that 'the greater the complexity of a technology, the lower the perceived value' of people (Ittersum *et al.*, 2006). The hypothesis was rejected by those who have already bought via a mobile phone. It is understood that because one who has never used technology tends to perceive it as more complex, it is expected that the more difficult and complicated it is to use technology, the less value people who have never used the technology will perceive. The opposite is likely to occur with those who have already purchased, as is the case in this study sample.

The sixth research hypothesis (H6) was that 'facilitating conditions positively influenced the perceived value' of individuals. Although this construct presented moderate means in the descriptive phase of the research, in the hypothesis tests, there was no acceptance of the established hypothesis. The facilitating conditions are characterized as a construct of great importance for the elderly population (Zaremohzzabieh *et al.*, 2014). However, the sample collected was predominantly composed of young adults. This would explain why there is no relation between the importance that people attribute to having means of support when buying in *m-commerce* with the value that they perceive in purchases via mobile phones.

Pleasure was the construct used to formulate the seventh research hypothesis (H7). With pleasure as a predictor of perceived value, the test results supported the hypothesis, indicating a positive influence of the construct on the response variable. This result is in agreement with the study of Lee *et al.* (2003), in which a strong relationship was found between the construct and the purchases made on the internet.

The eighth research hypothesis (H8) was that 'perceived security positively influenced perceived value'. The findings of the research converge with that of studies such as Oliveira *et al.* (2016) because the hypothesis was accepted. Thus, it is assumed that the greater the sense of security that people have in transmitting their information and banking data through mobile phones, the greater the perceived value.

The perceived cost is the ninth hypothesis of the research (H9) and the second to assume a relation of negative influence. That is, 'the higher the perceived cost, the lower the value that the person perceives' in *m-commerce*. The hypothesis was rejected. It is probable that because they knew the *m-commerce*, these people have a greater notion of the diversity of direct and indirect prices for the acquisition of goods and services in this environment; therefore, a negative influence between the construct and the response variable was reported.

The last hypothesis to be formulated (H10) was that the perceived value, which was being treated as predicted in previous hypotheses, now becomes a predictor of another variable, the intention to adopt. This hypothesis was confirmed, showing that the relationship between the constructs is solid and that it does not dissolve easily through sample differences.

Thus, seven out of the ten hypotheses were accepted in de general model. Figure 2 represents the final model of the research, based on the tests performed on the variables and the data collected.

FINAL CONSIDERATIONS

This article presents an analysis of the intention to adopt *m-commerce* from the perspective of constructs derived from

several theories of technology acceptance, with perceived value as a mediator of the relationship between acceptance constructs and the intention to adopt.

In this direction, it has practical and academic implications. On the practical side, there are two ways in which managers can benefit from the information contained in this survey. The first is by examining which factors make people who already know *m-commerce* continue to use this way of acquiring goods and services. According to the study, some of the characteristics that people who have previously bought something by cell phone value is to realize that to buy via cell phone is more advantageous than in other ways, such as from the computer, due to factors such as practicality, convenience, and exclusive discounts. Thus, managers of *m-commerce companies* should create specific benefits for people who relate to their brand through mobile devices. Some examples are loyalty programs, which may be tied to gamification processes. Promotions for those who make purchases through *m-commerce* and communication channels more interactive than traditional promotions.

There are also characteristics that must be worked out: to keep those who already buy and to attract new users. The first is perceived utility, that is, managers must continue working on the practicality and agility of systems so that people will realize that they are gaining performance in the activities performed. The second is pleasure. Making the experience of browsing sites and applications pleasurable, playful, and stress-free should be a priority for those who lead these industries in organizations. Finally, there is perceived security. Using secure platforms, with security certificates and making the user more relaxed while providing their credit card data, should be a constant concern of *m-commerce companies*.

The academic contribution of this research resides in the tested model that resulted in the model proposed at the end of the data analysis. Previous work on accepting people to consume via mobile devices is mostly based on a single theory of acceptance. Some of those theories are from 30 years ago and are already challenged to the context of constant technological change that we live in today. In the present study, five theoretical constructs of technology acceptance were used.

Furthermore, by not having related the acceptance constructs of the technology directly with the intention of adoption, but having placed among them a variable of moderation, the perceived value gives the study a greater representativity in the context of the cellular purchases.

However, because this was a quantitative work, some caveats must be made. The sample collected could have been slightly more heterogeneous in some sociodemographic variables, such as age group and educational level. The research was non-probabilistic and did not intend to make generalizations; however, a greater heterogeneity in the variable age group, for example, could enable a better understanding of the variable facilitating conditions and determine whether, despite the hypothesis being rejected, older people would have higher averages in this construct. Unfortunately, because there was a high concentration of young adults in the sample, this analysis was not feasible.

Another sampling feature is that because it was an exclusively *online* collection, although almost half of the people never bought anything via mobile phones, they have a cell phone with an internet connection, and this can generate a greater pre-disposition to some constructs than people who are not updated with new technologies.

Despite using diverse and current technology acceptance theories, they are not the only theories. There are others that can corroborate as much as those used in this research, if used together. The explanatory power of the model tested was significant, with 61% for the influence of the constructs derived from the theories and models of technology acceptance in the perceived value, and of 50% for the influence of perceived value on the intention to adopt m-commerce; however, 39% and 50%, respectively, of this behavior comes from other unknown variables. Therefore, it is necessary to add other variables in search of a more solid model.

Another alternative in the search of identifying variables to corroborate with the behaviors studied (perceived value and intention to buy) is to conduct qualitative research in this area. Based on the analyses, new categories would emerge, and these could in the future become scales that corroborate the understanding of the adoption of *m-commerce*.

REFERENCES

ABDULLAH, F.; WARD, R.; AHMED, E. 2016. Investigating the influence of the most commonly used external variables of TAM on students' Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) of e-portfolios. *Computers in Human Behavior*, **63:**75-90. https://doi.org/10.1016/j.chb.2016.05.014

ADIPAT, B.; ZHANG, D.; ZHOU, L. 2011. The effects of tree-view based presentation adaptation on mobile web browsing. *MIS Quarterly*, **35**(1):99-122. https://doi.org/10.2307/23043491

AGAG, G.; EL-MASRY, A.A. 2016. Understanding consumer intention to participate in online travel community and effects on consumer intention to purchase travel online and WOM: An integration of innovation diffusion theory and TAM with trust. *Computers in Human Behavior*, **60:**97-111. https://doi.org/10.1016/j.chb.2016.02.038

ANDREWS, M.; LUO, X.; FANG, Z.; GHOSE, A. 2015. Mobile ad effectiveness: Hyper-contextual targeting with crowdedness. *Marketing Science*, **35**(2):218-233. https://doi.org/10.1287/mksc.2015.0905

BRASEL, S.A.; GIPS, J. 2014. Tablets, touchscreens, and touchpads: How varying touch interfaces trigger psychological ownership and endowment. *Journal of Consumer Psychology*, **24**(2):226-233. https://doi.org/10.1016/j.jcps.2013.10.003

BRUNER, G.; KUMAR, A. 2005. Applying TAM to consumer usage of handheld Internet devices. *Journal of Business Research*, **58:**553-558. https://doi.org/10.1016/j.jbusres.2003.08.002

CHANG, T.; WILDT, A. 1994. Price, product information, and purchase intention: an empirical study. *Journal of the Academy of Marketing Science*, **22**(1):16-27. https://doi.org/10.1177/0092070394221002

CHEN, P.T.; HU, H.H. 2010. The effect of relational benefits on perceived value in relation to customer loyalty: An empirical study in the Australian coffee outlets industry. *International Journal of Hospitality Management*, **29**(3):405-412. https://doi.org/10.1016/j.ijhm.2009.09.006

CHEN, Z.; DUBINSKY, A.J. 2003. A conceptual model of perceived customer value in e-commerce: A preliminary investigation. *Psychology & Marketing*, **20**(4):323-347. https://doi.org/10.1002/mar.10076

CHONG, A.Y.L.; CHAN, F.T.; OOI, K.B. 2012. Predicting consumer decisions to adopt mobile commerce: Cross country empirical examination between China and Malaysia. *Decision Support Systems*, **53**(1):34-43. https://doi.org/10.1016/j.dss.2011.12.001

COMPEAU, D.; HIGGINS, C.A.; HUFF, S. 1999. Social cognitive theory and individual reactions to computing technology: A longitudinal study. *MIS Quarterly*, **23**(2):145-158. https://doi.org/10.2307/249749

DAVIS, F.D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, **13**(3):319-340. https://doi.org/10.2307/249008

DAVIS, F.D.; BAGOZZI, R.P.; WARSHAW, P.R. 1989. User acceptance of computer technology: a comparison of two theoretical models. *Management Science*, **35**(8):982-1003. https://doi.org/10.1287/mnsc.35.8.982

DAVIS, F.D.; BAGOZZI, R.P.; WARSHAW, P.R. 1992. Extrinsic and intrinsic motivation to use computers in the workplace. *Journal of Applied Social Psychology*, **22**(14):1111-1132. https://doi.org/10.1111/j.1559-1816.1992.tb00945.x

DAVIS, L.; HODGES, N. 2012. Consumer shopping value: An investigation of shopping trip value, in-store shopping value and retail format. *Journal of Retailing and Consumer Services*, **19**(2):229-239. https://doi.org/10.1016/j.jretconser.2012.01.004

DINH, H.T.; LEE, C.; NIYATO, D.; WANG, P. 2013. A survey of mobile cloud computing: architecture, applications, and approaches. *Wireless Communications and Mobile Computing*, **13**(18):587-1611. https://doi.org/10.1002/wcm.1203

DODDS, W.B.; MONROE, K.B.; GREWAL, D. 1991. Effects of price, brand, and store information on buyers' product evaluations. *Journal of Marketing Research*, **28**(3):307-319. https://doi.org/10.2307/3172866

EMARKETER. 2015. US MCommerce 2015: eMarketer's Forecast and Trends. Available at: http://www.emarketer.com/corporate/coverage#/results/1282. Accessed on: 10/05/2017.

FAQIH, K.M.; JARADAT, M.I.R.M. 2015. Assessing the moderating effect of gender differences and individualism-collectivism at individual-level on the adoption of mobile commerce technology: TAM3 perspective. *Journal of Retailing and Consumer Services*, **22:**37-52. https://doi.org/10.1016/j.jretconser.2014.09.006

FONG, N. M.; FANG, Z.; LUO, X. 2015. Geo-conquesting: Competitive locational targeting of mobile promotions. *Journal of Marketing Research*, **52**(5):726-735. https://doi.org/10.1509/jmr.14.0229

GARG, R.; TELANG, R. 2012. Inferring app demand from publicly available data. *MIS Quarterly*, **37**(4):1253-1264. https://doi.org/10.25300/MISQ/2013/37.4.12

GROB, M. 2015. Mobile shopping: a classification framework and literature review. *International Journal of Retail & Distribution Management*, **43**(3):221-241. https://doi.org/10.1108/IJRDM-06-2013-0119

HAIR, JR., J.F.; BLACK, W.C.; BABIN, B.J.; ANDERSON, R.E.; TATHAM, R.L. 2006. *Multivariate data analysis*. 6ª ed., Upper Saddle River, Pearson Prentice Hall, 734 p.

HINZ, O.; SKIERA, B.; BARROT, C.; BECKER, J.U. 2011. Seeding strategies for viral marketing: An empirical comparison. *Journal of Marketing*, **75**(6):55-71. https://doi.org/10.1509/jm.10.0088

HOLBROOK, M.B. 1999. Introduction to consumer value. *In:* M.B. HOLBROOK, *Consumer value: A framework for analysis and research*. London, Psychology Press, p. 1-28.

HSIAO, K.L.; CHEN, C.C. 2016. What drives in-app purchase intention for mobile games? An examination of perceived values and loyalty. *Electronic Commerce Research and Applications*, **16:**18-29. https://doi.org/10.1016/j.elerap.2016.01.001

HSIAO, M.H.; CHEN, L.C. 2015. Smart phone demand: An empirical study on the relationships between phone handset, Internet access and mobile services. *Telematics and Informatics*, **32**(1):158-168. https://doi.org/10.1016/j.tele.2014.06.001

HUANG, E.Y.; LIN, S.W.; FAN, Y.C. 2015. MS-QUAL: mobile service quality measurement. *Electronic Commerce Research and Applications*, **14**(2):126-142. https://doi.org/10.1016/j.elerap.2015.01.003

INSTITUTO BRASILEIRO DE GEOGRAFIA E ESTATÍSTICA (IBGE). 2015. Banco de arquivos Estatísticas 2010-2015. Available at: https://downloads.ibge.gov.br/downloads_estatisticas.htm. Accessed on: 27/10/2018.

ITTERSUM, K.; ROGERS, W.A.; CAPAR, M.; PARK, S.; CAINE, K.E.; O'BRIEN, M.A.; PARSONS, L.J.; FISK, A.D. 2006. *Understanding technology acceptance: phase 2. Identifying and validating the metrics and preliminary testing of a quantitative mode*. Atlanta, Georgia Institute of Technology. Available at: https://smartech.gatech.edu/bitstream/handle/1853/40578/HFA-TR-0604%20TechAcceptPhaseII%20Dec31%202006.pdf?sequence=1&isAllowed=y. Accessed on: 27/10/2018.

JACOBY, J.; OLSON, J. 1977. *Consumer response to price: an attitudinal, information processing perspective*. Chicago, American Marketing Association, 35 p.

JEYARAJ, A.; ROTTMAN, J.; LACITY, M. 2006. A review of the predictors, linkages, and biases in IT innovation adoption research. *Journal of Information Technology*, **21**(1)**:**1-23. https://doi.org/10.1057/palgrave.jit.2000056

KIM, D.; CHUN, H.; LEE, H. 2014. Determining the factors that influence college students' adoption of smartphones. *Journal of the Association for information Science and Technology*, **65**(3):578-588. https://doi.org/10.1002/asi.22987

KIM, H.W.; CHAN, H.C.; GUPTA, S. 2007. Value-based adoption of mobile internet: an empirical investigation. *Decision Support Systems*, **43**(1):111-126. https://doi.org/10.1016/j.dss.2005.05.009

KLEIJNEN, M.; DE RUYTER, K.; WETZELS, M. 2007. An assessment of value creation in mobile service delivery and the moderating role of time consciousness. *Journal of Retailing*, **83**(1):33-46. https://doi.org/10.1016/j.jretai.2006.10.004

KONRAD, K. *et al.* 2015. Bridging the divide: using UTAUT to predict multigenerational tablet adoption practices. *Computers in Human Behavior*, **50:**186-196. https://doi.org/10.1016/j.chb.2015.03.032

KULVIWAT, S.; BRUNER, I.I.; GORDON, C.; KUMAR, A.; NASCO, S.A.; CLARK, T. 2007. Toward a unified theory of consumer acceptance technology. *Psychology & Marketing*, **24**(12):1059-1084. https://doi.org/10.1002/mar.20196

KWON, K.; CHON, B. S. 2009. Social influences on terrestrial and satellite mobile-TV adoption in Korea: Affiliation, positive self-image, and perceived popularity. *The International Journal on Media Management*, **11**(2):49-60.

LEE, M.B.; SUH, K.S.; WHANG, J. 2003. The impact of situation awareness information on consumer attitudes in the Internet shopping mall. *Electronic Commerce Research and Applications*, **2**(3):254-265. https://doi.org/10.1016/S1567-4223(03)00028-0

LEUNG, L.; WEI, R. 1999. Who are the mobile phone have-nots? Influences and consequences. *New Media & Society*, **1**(2):209-226. https://doi.org/10.1177/14614449922225564

LI, X.; PETRICK, J.F. 2008. Examining the antecedents of brand loyalty from an investment model perspective. *Journal of Travel Research*, **47**(1):25-34. https://doi.org/10.1177/0047287507312409

LOVELOCK, C.H.; WIRTZ, L. 2011. S*ervices marketing*. Upper Saddle River, Prentice Hall, 612 p.

MADUKU, D.K.; MPINGANJIRA, M.; DUH, H. 2016. Understanding mobile marketing adoption intention by South African SMEs: A multi-perspective framework. *International Journal of Information Management*, **36**(5):711-723. https://doi.org/10.1016/j.ijinfomgt.2016.04.018

MCKENZIE, J. 2001. How teacher learn technology best. Available at: http://fno.org/mar01/howlearn.html. Accessed on: 20/09/2017.

MEHRABIAN, A.; RUSSELL, J.A. 1974. *An approach to environmental psychology*. Cambridge, MIT Press, 331 p.

MMA ASIA. 2011. Available at: http://www.mmaglobal.com/documents/how-big-mobilemarketing-opportunity. Accessed on: 27/10/2018.

MOORE, G.C.; BENBASAT, I. 1991. Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, **2**(3):192-222. https://doi.org/10.1287/isre.2.3.192

NG, M. 2016. Factors influencing the consumer adoption of Facebook: A two-country study of youth markets. *Computers in Human Behavior*, **54:**491-500. https://doi.org/10.1016/j.chb.2015.08.024

NILASHI, M.; IBRAHIM, O.; MIRABI, V.R.; EBRAHIMI, L.; ZARE, M. 2015. The role of Security, Design and Content factors on customer trust in mobile commerce. *Journal of Retailing and Consumer Services*, **26:**57-69. https://doi.org/10.1016/j.jretconser.2015.05.002

OLIVEIRA, T.; THOMAS, M.; BAPTISTA, G.; CAMPOS, F. 2016. Mobile payment: Understanding the determinants of customer adoption and intention to recommend the technology. *Computers in Human Behavior*, **61:**404-414. https://doi.org/10.1016/j.chb.2016.03.030

ÖZTA-, Y.B.B. 2015. The increasing importance of mobile marketing in the light of the improvement of mobile phones, confronted problems encountered in practice, solution offers and expectations. *Procedia-Social and Behavioral Sciences*, **195:**1066-1073. https://doi.org/10.1016/j.sbspro.2015.06.150

PANDO-GARCIA, J.; PERIAÑEZ-CAÑADILLAS, I.; CHARTERINA, J. 2016. Business simulation games with and without supervision: An analysis based on the TAM model. *Journal of Business Research*, **69**(5):1731-1736. https://doi.org/10.1016/j.jbusres.2015.10.046

PANTANO, E.; PRIPORAS, C.V. 2016. The effect of mobile retailing on consumers' purchasing experiences: A dynamic perspective. *Computers in Human Behavior*, **61:**548-555. https://doi.org/10.1016/j.chb.2016.03.071

PAPPAS, I.O.; KOUROUTHANASSIS, P.E.; GIANNAKOS, M.N.; CHRISSIKOPOULOS, V. 2016. Explaining online shopping behavior with fsQCA: The role of cognitive and affective perceptions. *Journal of Business Research*, **69**(2):794-803. https://doi.org/10.1016/j.jbusres.2015.07.010

ROGERS, E.M. 1995. *Diffusion of innovations*, 4ª ed., New York, The Free Press, 518 p.

ROGERS, E.M. 2003. *Diffusion of innovations*, 5ª ed., New York, The Free Press, 512 p.

SCHECHTER, L. 1984. A normative conception of value. *Progressive Grocer, executive report*, **2:**12-14.

SHANKAR, V.; BALASUBRAMANIAN, S. 2009. Mobile marketing: a synthesis and prognosis. *Journal of Interactive Marketing*, **23**(2):118-129. https://doi.org/10.1016/j.intmar.2009.02.002

SHANKAR, V.; KLEIJNEN, M.; RAMANATHAN, S.; RIZLEY, R.; HOLLAND, S.; MORRISSEY, S. 2016. Mobile shopper marketing: Key issues, current insights, and future research avenues. *Journal of Interactive Marketing*, **34:**37-48. https://doi.org/10.1016/j.intmar.2016.03.002

SHANKAR, V.; VENKATESH, A.; HOFACKER, C.; NAIK, P. 2010. Mobile marketing in the retailing environment: current insights and future research avenues. *Journal of Interactive Marketing*, **24**(2):111-120. https://doi.org/10.1016/j.intmar.2010.02.006

TAYLOR, S.; TODD, P.A. 1995. Understanding information technology usage: A test of competing models. *Information Systems Research*, **6**(2):144-176. https://doi.org/10.1287/isre.6.2.144

THALER, R. 1985. Mental accounting and consumer choice. *Marketing Science*, **4**(3):199-214. https://doi.org/10.1287/mksc.4.3.199

THOMPSON, R.L.; HIGGINS, C.A.; HOWELL, J.M. 1991. Personal computing: toward a conceptual model of utilization. *MIS Quarterly*, **15**(1):125-143. https://doi.org/10.2307/249443

TUŠKEJ, U.; GOLOB, U.; PODNAR, K. 2013. The role of consumer–brand identification in building brand relationships. *Journal of Business Research*, **66**(1):53-59. https://doi.org/10.1016/j.jbusres.2011.07.022

VATANASOMBUT, B.; IGBARIA, M.; STYLIANOU, A.; RODGERS, W. 2008. Information systems continuance of web-based applications customers: the case of online banking. *Information & Management*, **45**(2):419-428. https://doi.org/10.1016/j.im.2008.03.005

VENKATESH, V.; MORRIS, M.G. 2000. Why don't men ever stop to ask for directions? Gender, social influence, and their role in technology acceptance and usage behavior. *MIS Quarterly*, **24**(1):115-139. https://doi.org/10.2307/3250981

VENKATESH, V.; MORRIS, M.G., DAVIS, G.B.; DAVIS, F.D. 2003. User acceptance of information technology: Toward a unified view. *MIS Quarterly*, **27**(3):425-478. https://doi.org/10.2307/30036540

VENKATESH, V.; THONG, J.Y.; XU, X. 2012. Consumer acceptance and use of information technology: extending the unified theory of acceptance and use of technology. *MIS Quarterly*, **36**(1):157-178. https://doi.org/10.2307/41410412

WANG, Q.; SUN, X. 2016. Investigating gameplay intention of the elderly using an Extended Technology Acceptance Model (ETAM). *Technological Forecasting and Social Change*, **107:**59-68. https://doi.org/10.1016/j.techfore.2015.10.024

WILCOX, R. 2011. *Modern statistics for the social and behavioral sciences: A practical introduction*. Boca Raton, CRC Press, 862 p. https://doi.org/10.1201/9781466503236

WONG, C.H.; TAN, G.W.H.; TAN, B.I.; OOI, K.B. 2015. Mobile advertising: the changing landscape of the advertising industry. *Telematics and Informatics*, **32**(4):720-734. https://doi.org/10.1016/j.tele.2015.03.003

WOODRUFF, R.B. 1997. Customer value: the next source for competitive advantage. *Journal of the Academy of Marketing Science*, **25**(2):139-153. https://doi.org/10.1007/BF02894350

WOODRUFF, R.B.; GARDIAL, S. 1996. *Know your customer: new approaches to understanding customer value and satisfaction*. Cambridge, Wiley, 360 p.

WOODWALL, T. 2003. Conceptualising 'value for the consumer': an attributional, structural and dispositional analysis. *Academy of Marketing Science Review*, **12**(12):1-31.

ZAREMOHZZABIEH, Z.; SAMAH, B.A.; OMAR, S.Z.; BOLONG, I.; SHAFFRIL, H.A.M. 2014. Malaysia: Exploring the moderating effect of age and experience. *Journal of Applied Sciences*, **14**(9):873-882. https://doi.org/10.3923/jas.2014.873.882

ZEITHAML, V. 1988. Consumer perceptions of price, quality and value: a means-end model and synthesis of evidence. *Journal of Marketing*, 52(3):2-22.

Submitted on November 15, 2017
Accepted on April 26, 2018