



Research Article

Participation and Satisfaction as Drivers for Human Action: M-Internet and Community Life

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Abstract: Any technology adoption is shaped by a myriad of factors that sometimes conflict in their goals and outcomes. So is the case with mobile internet (m-internet) adoption. This paper discusses the role participation and satisfaction play in the m-internet adoption process. Within a theoretical framework that articulates Maslow's hierarchy of needs theory and the uses and gratification theory (U&G) and other theoretical models of adoption and acceptance of innovations, this paper explores the connection between participation in online communities, which implies both social interaction and content production, and the satisfaction of users' needs. Several technology adoption models identify participation and satisfaction as key drivers for adoption, but few discuss how different players in the process depict these variables and these differences might sometimes result in rejection.

Our research presents results for the use of m-internet in a southern European country - Portugal - and identifies participation and satisfaction as variables that are predictors of adoption and help in explaining varied use patterns between m-internet and fixed internet and changes in the adoption process.

Keywords: Participation; satisfaction; m-internet; mediated communication; social interaction; technology adoption

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1. Introduction

The role technology plays in social relationships and how users' levels of participation in community activities shapes these processes is a fruitful field for the exploration of the outcomes that may occur with the adoption of new forms of technology. We can ask if new forms of media use and access generate original forms of interaction and outcomes not previously known, or try to determine which forces shape the process. So is the case with mobile access to the internet (m-internet). Mobile technologies have been around for more than a decade and the internet is a technology no longer in its infancy. The consequences the internet has for the communitarian experience have been studied in the past (Dutta-Bergamn, 2005, Wellman, & Gulia, 2002) similarly to the study of mobile technologies adoption (López-Nicolás, Molina-Castillo & Bouwman, 2008; Hong, S & Tam, K, 2006), but both processes have seldom been studied in conjunction (Hampton, Lee, & Her, 2011).

The present paper deals with the roles participation and satisfaction play in the use of mobile internet (m-internet) and the information that gives us on the nature of the adoption process of this particular innovation and how it represents a paradigmatic form of tension between the ones' promoting the technology – hereafter called the “stakeholders” – and those actually adopting it – the “users”. The central research questions we posit here examine whether changes in the type of access also change the nature of the users' experiences, whether levels of participation and satisfaction in the online experience vary with the type of access. The paper focuses on evaluating the consequences of m-internet access and on the relevance of mobility as a driving force for social involvement and interaction, questioning if users of m-internet are more participative and present higher levels of satisfaction with their online experience when compared with users of fixed internet access, and if the type of access has any impact on the type of activities performed. Our main research problem is to understand how individual and social variables interact in the use and adoption of a particular technology feature and how different players' expectancy values may affect such process.

2. Participation and satisfaction

Our departure point for defining the concepts of participation and satisfaction is the classic theory of motivation developed by Abraham Maslow (1943). The psychologist identified and categorized the needs which he considered to be the drivers for human action and the requisites for full psychological health.

The concepts of participation and satisfaction take different positions in Maslow's pyramid. Participation is a behavior that is based on social interaction but that can also encompass collaboration and the production of something. Thus, it is integrated in the middle category of love, which includes both giving and receiving love, and can be efficiently address by developing a sense of belonging to a group. This sense of belonging can assume different shapes and degrees, varying in social capital (for instance from bridging to bonding) and participation. From participation derives a double-sided sense of belonging, as one feels that something belonging to him and also that one belongs to a group. However, participation can also be thought of as a requisite for satisfying the following need of esteem, which is also double-sided. The sense of belonging to a group is essential for feeling esteemed by others, thus reflecting in one's self-esteem.

On the other hand, satisfaction is a much more diffuse and difficult to position concept, as one can obtain satisfaction from all types of needs, from eating to knowledge. We consider satisfaction as related to fulfilling needs through participation within a social network in order to enhance well-being and improve quality of life. Plus, Maslow (1970) also points out that the human being is naturally unsatisfied, as when the deficiency needs are fulfilled, one tends to seek self-actualization, which the author defines as 'becoming more and more'.

Let's take a closer look at how the concepts of participation and satisfaction have been operationalized regarding media consumption, and particularly the internet and mobile devices. The notion of participation is considered to be a complex and contested one, characterized by a diversity of meanings throughout history that derive from the continuous processes of societal and conceptual change and transformation (Deuze, 2008).

According to Pateman (1970), participation is a process in which one can influence other in a decision-making body, affecting the outcome of the process. Participation is, therefore, associated with empowerment, giving people opportunities to participate and also empower people so that they can exercise participation; with involvement in a particular action, commitment, engagement or even group action, since participation has a social conception and always requires a group of individuals with which we can participate in. According to Sidorenkon (2006), participation is a process of taking part in different spheres of societal life, such as political, economic, social, cultural or others. We define participation as the process of having access, interacting and participating in a social network, regardless the area it may be integrated, whether political, social, or cultural. Participation is here assumed as a process that involves specific actors within a social network and their power of being involved and engaged in the decision-making processes of that group in which they participate in and where they exercise their participatory practices with different intensities, characteristics and power position (hierarchical power). Participation both involves instrumental aspects – having access to – as social ones – participating with – and in the case of

our study concerns both the instrumental participation in the network via access and the social participation in that same network via the satisfaction of a set of needs and perceived values that result from adoption. The clash we have previously mentioned results from the inclusion of institutional influences deriving from the stakeholders as a control factor for this process.

Closely related to participation is the notion of satisfaction. Several theories have tried to grasp how individual behavior molds itself in order to seek satisfaction. In the view of the Theory of Reasoned Action (TRA), an individual's behavior intentions determine his or her actual behavior. Behavior intention is in turn determined by the individual's attitude toward this behavior and subjective norms with regard to the performance of this behavior (Fishbein and Ajzen, 1975). Uses and gratifications theory (U&G) explains media consumption patterns and reception as driven by need satisfying-seeking behavior. There are different categorizations of the uses and gratifications that individuals seek in media consumption (West and Turner, 2010), such as the early proposal of Lasswell (1948) – surveillance, correlation, entertainment and cultural transmission – or the more recent argument of McQuail, Blumler and Brown (1972), according to which the main drivers for media consumption concern diversion, personal relationships, personal identity and surveillance. Katz, Haas and Gurevitch (1973) suggest as an alternative that media consumption addresses five types of needs: cognitive, affective, personal integrative, social integrative and tension release. Within this theory, the distinction between satisfaction and gratification is particularly relevant: satisfaction is viewed as the result of fulfilling a need of any type, as gratification implies that the process of satisfying a specific need is pleasurable. Thus, the uses and gratifications theory argues that mass media consumption is motivated not only by its usefulness in satisfying specific needs but mostly because the process of satisfying these needs is enjoyable and consequently preferable to other alternatives for obtaining the same result (West and Turner, 2010). More recently, the uses and gratifications theory has been applied to new media, exploring the role of interactivity in media use patterns and need satisfying-seeking behavior (Ruggiero, 2000). For instance, Park, Kerk and Valenzuela (2009) have found out that using Facebook satisfies the following needs: socializing, entertainment, self-seeking and information.

Another possible approach to the concept of satisfaction derives from social capital theory. Social capital is considered as a metaphor about the advantage that inheres in social relationships, created by the position an individual has within a social network and the his access to the resources shared within that network of relationships (Bourdieu, 1986, Hampton, et al, 2011). Investment in social networks allows individuals to develop trust and reciprocity, variables that are necessary for a positive engagement and commitment in collective actions, promoting interaction, shared activities with others, access to information and to opportunities that one could not achieve by himself. This means to improve individuals' well-being and quality of life (Valenzuela, Park & Kee, 2009). Satisfaction, in this context, is mostly related to this perspective of quality of life improvement, well-being enhancement and fulfillment of needs that are associated with the resources and outcomes one may have due to his participation within a social network. One may be satisfied with his position inside a social network because it improves his well-being, quality of life and increase the number of positive opportunities, whether inside or even outside his network of relationships. Satisfaction is here related to the value of all benefits and outcomes an actor can obtain and control due to his presence in a web of network of relationships. Regarding m-internet, satisfaction should be viewed as the gratification and contentment resulting from m-internet use, encompassing expectations and anticipation of possible outcomes in terms of an individual' web of social relationships and opportunities that online experience via mobile may offer to users. Scheufele and Shah (2000), as well as (Valenzuela, et al, 2009), approached social capital theory by distinguishing between three different domains: the intrapersonal, the interpersonal and the behavioral domains. Intrapersonal domain is related to individuals' satisfaction with their web of social ties and their relationships within their communities, interpersonal domain is related to social trust and reciprocity among individuals that allows for the development of interaction and engagement in collective actions, and behavioral domain refers to individuals' participation actions and social activities performed within their social network or communities. This perspective entails that satisfaction is not only equal to subjective happiness with an experience or a particular position in a social network, but is also determined by social ties. Members of the same social network share happiness, confidence, positive interactions and that influences the whole social network promoting satisfaction. Therefore, it is expected that individuals that actively participate online are more likely to present higher levels of connectedness and satisfaction with online experience. Also, according to Putnam (2000), higher levels of reciprocity and trust are correlated with satisfaction and participation.

Thus, we argue that Maslow's hierarchy of needs (1970), some formulations of the uses and gratifications theory (Katz, Haas and Gurevitch's, 1973) and the notion of social capital applied to online communities (Putnam, 2000) are relevant theoretical frameworks for exploring the concepts of participation and satisfaction as drivers for mobile technologies use. Drawing from these theories, one could argue that this technology is firstly and more commonly used for fulfilling deficiency needs, such as coordinating or finding information, and only secondly used for communication and participation. In addition, we argue that satisfaction is inherent to participation in the same way that the uses of mass media are associated to obtaining gratification, i.e., participating in online communities, whether creating and sharing content whether communication and socializing, is intrinsically enjoyable and pleasurable, thus reinforcing the importance and frequency of these activities, which are furthermore facilitated by the possibility of accessing the internet via portable devices.

Thus, taking into account the convergence of the internet and mobile phones on smartphones and other portable devices, we explore more specifically the possibility of participation and satisfaction being drivers for m-internet adoption and use, exploring the relevance of each factor and its understanding from the standpoint of two different actors in the process: the stakeholders and the users. As m-internet adds a wide range of possibilities to mobile phone uses and to the gratifications obtained, identifying the main sources of satisfaction and the main ways of participating are relevant goals to clarify the range of needs satisfied and of gratifications obtained by the mobile phone, thus enlightening the motivations for the ever increasingly widespread, frequent, intense and diversified use of this medium.

3. Mobile phone and mobile internet

Mobile technologies adoption has usually been studied from the users' perspective (Wu & Wang, 2005; Wang & Wang, 2010) and mostly based on Davis's (1989) technology acceptance model (TAM) or revised versions of this same model (Venkatesh et al., 2003). Most of these theories and models have been tested in organisational settings, where individuals use mobile technologies for work purposes. Attempts at introducing social variables usually involve the consideration of diffusion theory related factors (Rogers, 1962) as antecedents of perceived behaviour and intentions (López-Nicolas, Molina-Castillo & Bouwman, 2008). In these views, it was the satisfaction of personal needs that contributed to the spread of mobile phone usage (Silverstone and Haddon, 1996) and to its ongoing reinvention by its users (Hoflich & Rossler, 2002). We postulate that parts of these needs are shaped both by agendas pushed by stakeholders or by collective constructions of individually perceived satisfaction factors. Though, we seek to move the analysis from individual to social factors and to understand both participation and satisfaction in light of those.

Two main uses of the mobile phone are usually discussed: coordination and connectivity (Ling, 2008; Katz, 2008; Ling & Donner, 2009; Haddon & Green, 2010). Within coordination, Ling and Yttri (2002) distinguish between micro-coordination and hyper-coordination. The first refers to a more instrumental use, coordinating daily tasks, both professional and personal. However, the latter concerns the coordination of social groups and networking, encompassing the management of identity, status and sense of belonging. Consistently with Maslow's hierarchy of needs, the authors find that only when the more simple and instrumental coordination tasks are mastered do users evolve to hyper-coordination. Regarding connectivity, the mobile phone and mobile devices enhance the frequency of contact within close and tight networks of relationships, thus affording a sense of perpetual contact (Katz & Aakhus, 2002). Consequently, coordination and connectivity are interdependent uses that enable participation and the satisfaction of immediate and simple needs, such as obtaining information or giving an order, and also the satisfaction of more complex and multifaceted needs, such as belonging to a group or managing one's social networks. Concerning participation, Vincent and Harper (2003) and Vincent (2005) argue that the emotional life is very important for individuals and therefore the use of technology regards the maintenance of interpersonal relationships. That is why that people are willing to pay for services that connect them with people they love the most because it brings them satisfaction. Taylor and Harper (2002) also argue that the mobile phone meets the need for social integration arguing that technology is part of the social contract that regulates interpersonal relationships.

Nowadays, the use of m-internet on mobile devices is growing. Townsend and Rios (2011) argued that mobile devices are considered mobile phones, with two broad categories:

smartphones and feature phones, notebooks and tablets. These latter merge both mobile features and computer features, since they are mobile but they work as a pc (Townsend & Rios, 2011). One of the central features of today's mobile phones or, the so called smartphones, is the possibility of accessing internet on the move. Mobile internet (m-internet) entails access to value-add applications and multimedia content via a device with mobile communication capacities that allows for physical displacement during the use activity. The concept is still a controversial one, far from a clear and delimited description. Some authors agree that m-internet refers to the use of internet on mobile devices (Gerpott, 2010; Wang & Wang, 2010) but the understanding of what a mobile device exactly is in our days is something of a riddle. Some consider m-internet a synonymous of wireless internet that includes both going online with a laptop using a wi-fi connection or broadband card or going online via a mobile phone (Smith, 2010). To some extent, going online via wirelessly connectivity is one of the agreed features of m-internet. Wireless connectivity enables internet access wherever whenever (Wellman, Quan-Haase, Boase, & Chen, 2002), an important aspect being to perform activities on the go. According to these authors, mobile activities are activities, performed in a wireless environment through a mobile device, via the internet, the major difference between mobile and fixed internet being the mobility and accessibility the network and the platform allow. We understand m-internet as internet access and consumption performed via wireless, 3G or 4G platforms using mobile devices that allow for physical displacement during use operations, which means, to perform activities on the move, anywhere and at any time. On contrary, fixed internet refers to the access to internet via a laptop or desktop in a steady and fixed space, whether one uses wired or wireless connectivity.

Hence, this paper explores if the activities performed via m-internet are the same or differ from fixed access, and if they are closer to patterns of behaviour related to fixed internet or to mobile phone use.

4. Research design and method

The present study is part of a broader longitudinal project grounded on a interpretative approach to mobile internet consumption in Europe, and more particularly in Portugal, aiming to identify adoption and use patterns, and to explore the motivations behind them. This project started with an overview of existent data and literature in order to re-define the problem to be addressed. After this initial stage two complementary studies were developed: one more based on the analysis of the stakeholders' view of m-internet adoption and dissemination and the other based on the analysis of the users' perspective of this technology usage and value.

Currently, the research project moved on to an empirical stage where a mobile platform was developed and tested in regards to adoption patterns, network effects, benefits of using, social interaction and social capital impact. This paper will only discuss the results obtained at both stakeholders and users' study, since the empirical study is still ongoing.

The empirical work presented follows an interactive and qualitative research design (Maxwell, 2006), although it combines both qualitative and quantitative methods. It deals with mobile internet adoption and it intends to confront the stakeholders' and the users' views on this phenomenon, particularly in what regards the motivations for adoption and the most common use practices.

The first study questioned the main stakeholders of the industry on mobile technology and m-internet adoption, forms of usage and behavior patterns in regard to this type of technology. This study included a set of interviews performed with stakeholders and was based on qualitative techniques of analysis. Each interview consisted of 18 predetermined questions. The script for the guided interviews was based on previous studies that also analyzed the stakeholders' view about the adoption of one technology (Quico, Damásio, Henriques & Veríssimo, 2010; The World Internet Project, 2012). The respondents were offered total freedom of expression and reasoning apart from the questions themselves. The interviews were performed face-to-face. All interviews were transcribed and analysed with the help of the software NVIVO.

A more quantitative approach was developed to study the users, as it was more adequate for achieving the representativeness of the sample intended. A survey was applied in order to find out the users' perspective on m-internet services and possibilities, characterize m-internet access in Portugal, identify the factors that contribute to its growth and identify the activities performed via m-internet in comparison with fixed access to the internet. The survey was developed based on

previous measures (Zickuh, Kathryn, Smith, Aaron, 2011 – Pew Internet & American Life project; Smith, Aaron, 2010 - Pew Internet & American Life Project; Lejnicks, Carly, 2008). A pre-test was performed with a convenience sample of 40 individuals in order to improve the instrument and ensure that there were no misunderstanding issues. The final version is divided into three main parts: the first part is concerned with a descriptive analysis of mobile phone and m-internet usage, the second part is mainly concerned with the type of activities and tasks performed via m-internet access and the levels of participation and satisfaction of individuals within communities in that process, finally, the third part is concerned with sample and demographic characterization. The survey has in total 20 questions.

Within the survey, two items are more relevant for the purposes of this paper – the first one is focused on participants' online activities, both via mobile and via fixed internet access; the second is based on a measure developed for analysing the levels of satisfaction and participation of m-internet users. These variables refer to satisfaction and participation when using the internet and, specifically, when using social websites or social web platforms whether via mobile or via fixed access.

This measure was previously tested and adjusted via an exploratory and confirmatory factor analysis; the final measure reached a good adjustment for the data (cronbach $\alpha=0,897$, CR=0,895; VEM=0,594). The quantitative data was analysed with IBM SPSS 20. In order to analyse the research hypothesis questioned, statistical analysis was performed with a level of confidence of 95% ($\alpha=0,05$). Having in view to analyse whether the type of access has any influence on the activities performed online and to understand what kind of online activities are more conducted via mobile internet, a multi-dimensional scale analysis was performed. The values of proximity were calculated based on the answers to this item in the inquiry, using the algorithm Proxcal. The selection of the minimum number of dimensions to keep in the model in order to reproduce parsimoniously the similarities/dissimilarities between the activities (via mobile and fixed access) was held respecting the scree-plot criteria and the proximity versus transformed distance graphics criteria. The quality of the model was analyzed through the STRESS-I index and DAF index, using the reference values defined in Marôco (2007).

In order to analyze whether the levels of satisfaction and participation with online experience have any influence on the decision of using or not using m-internet we use the Wilcoxon-Mann-Whitney non-parametric since the conditions to use a parametric test failed. After confirming the influence of satisfaction and participation in the intention to use m-internet, a discriminant analysis was made in order to identify the variables that better differentiate between the groups and to create a model (discriminant function) that will allow us to identify, a priori, the subjects that have the intention of adopting and using m-internet and the ones that probably won't have that intention. The assumptions to perform this analysis were tested, namely normality assumptions with the test Kolmogorov-smirnov and homogeneity of variance-covariance matrices from each group with the test M-Box. Most variables do not present a normal distribution, though since the size sample is larger than 30 ($N=1107$) so we will assume normality assumption. Regarding M-Box, the assumption of homogeneity is valid ($p>0,05$).

5. Results

5.1. Stakeholders' perspective

In this section, the results from the qualitative study based on a set of interviews with stakeholders from the mobile communications industry will be reported. These results concern only the stakeholders' view and opinion of m-internet adoption and dissemination. It is relevant to highlight here that stakeholders understood m-internet as internet on mobile phones and, or smartphones.

The main goal of this study was to explore and to search for relevant research questions contributing to the understanding of how the industry faces the changing technological environment in this field and how they perceive m-internet dissemination, key drivers, social and individual consequences and network effects of access to m-internet.

The following stakeholders of mobile manufacturing companies were interviewed: Sony Ericsson's Key Account Manager; Nokia's Communication Manager; LG's Marketing Manager; market research companies, Marktest's Internet Director; GFK's Business Group Director; Netsonda's partner; mobile marketing companies, TIMWE's product manager, and mobile

network operators, Optimus' Internet Mobile Multimedia Services Manager; Internet Services Director at Vodafone; and ZON's voice product manager.

Interviews show that stakeholders believe that mobile phones' sales are decreasing in Portugal and worldwide but, on the other hand, smartphones are having an exponential growth due to the price being so similar to the ordinary mobile phone. As consequence of this democratization, stakeholders' perspective is that m-internet is growing, as smartphones naturally need internet for their features. According to stakeholders' view, the age group between 25-34 years is the one that uses more m-internet in Portugal, from social media and email, to news and meteorology contents.

Vodafone considers that the use of m-internet will soon exceed the use of internet on a PC. Vodafone also argues that m-internet is more utilitarian and frequent along the day but has a shorter duration of access, when compared with a normal internet access on a computer. They also believe that there is a peak of usage at lunch time, between 6pm and 7pm and a primetime between 10 pm and 11 pm. Friday is believed to be the day with more traffic.

According to all interviews, m-internet users are becoming multiplatform. This means that they can access it everywhere, anytime and through different devices. This mobility allows a better exploitation of the internet and its possibilities, the creation of a more appealing experience and spending less time on a computer.

For the majority of the stakeholders, with exception of those from mobile networks operators, the price plans available are the main obstacle to the expansion of the m-internet, as they still have high prices and limited traffic. Another obstacle listed was the lack of information and literacy of Portuguese people regarding the existent services.

Stakeholders argued that the majority of users access m-internet through smartphone devices but there are still some users using featured phones. Smartphone users have a higher exploitation of data used and minutes spent online every day. They access internet through browser and/or apps.

As main motivations to access m-internet, stakeholders, especially those who represent mobile network operators, considered that social networks represent a very high share of internet traffic through mobile phones. This information was established by market research companies, as they highlighted that a high percentage of young people aged 15-17 access social networks on mobile phones and half of this value in the following age groups 18-24 and 25-34.

Mobility is one of the main motives to use internet on mobile phones as it gives access to new services and possibilities (e.g. geolocation) and new types of consuming, sharing and communicating. In a near future, stakeholders expect that people will perform the same tasks via m-internet than we do now via fixed internet, like editing documents and store data. Social networks and email access are other important reasons to have m-internet and the main banners in attracting customers to this service. Geo-location is another motivation mentioned by the stakeholders. Stakeholders referred to an interesting topic about the impact of m-internet on social practices, as they considered that m-internet access makes it easier to communicate and share information in real time. This fact contributes to social closeness and public life involvement. Stakeholders remembered some of the social movements that were initiated via the internet and mobile access e.g. Arab Spring and London riots.

5.2. Users' perspective

In this section, we will present the results achieved with a survey applied to a representative sample of the Portuguese population (n=1107) at the end of 2012. The individuals from this sample are aged between 14 and 64 years (mean age=38,69), 49% being male and 51% being female. The vast majority of the sample (81%) has elementary and high school education, 42,7% frequented elementary school, 38,0% frequented high school, 9% have a degree, 1,4% have a master, 0,3% have a PhD and 7,1% have less than primary school. The sampling was conducted in a random way in all regions of the country and the survey application was performed face-to-face in the individuals' households.

In this paper we will focus only on the data relevant for the purposes of this paper - participation and satisfaction variables. Therefore, only the questions that are more relevant both to characterize the sample and examine the research problem raised will be analyzed and

discussed. As it was explained before, this survey analyses specifically m-internet adoption, dissemination and use and compare some variables in regard to the type of internet access used - mobile and fixed internet access.

Some initial items analyzed mobile devices ownership and use, whether participants use m-internet, via which devices, for how long, how, when or where. The data indicates that almost all participants have a mobile phone device (96,6%), however only 19,1% are smartphones. When questioned whether they use m-internet, either by mobile phone or other mobile devices such as tablets, iPad, or others, only 15,7% answered affirmatively. From those, 23% replied they use it via mobile phone, 7% via tablet devices, 2% via iTouch devices, 4% via iPad devices, and 6% via Psp.

Participants that use m-internet were questioned for how long they use it. Most individuals replied they use this type of access for more than one year (73,1%), 15,4% use it between 6 months to 1 year, and 11,5% use it for less than 6 months. Regarding the frequency of use, most participants (30,5%) use mobile internet two to three times per week, 32,2% use it sometimes per week, 21,3% replied they use it rarely and 16,1% replied they are always on. Referring to the moment during the day in which individuals most use m-internet (graphic 1), participants responded they mostly use m-internet between 12a.m.-4p.m. (43,1%) and between 8p.m.-12p.m. (41,4%).

The inquiry also asked participants about their behaviors in using mobile internet, if they normally use the browser or apps to surf the web in their mobile devices, offering them a scale from 1 to 7 in which 1 meant they never use and 7 they always use it. Most participants answered they use the browser (mean=4,77, sum=830), when compared with apps (mean=3,62; sum=630).

Other relevant and interesting results are related to the analysis of the activities performed online, both via mobile and fixed internet access. The inquiry posted a list of activities performed online (the same online activity was always questioned twice, one regarding the mobile access and one regarding the fixed access to the internet), and asked participants their agreement with the sentences on a scale from 1 to 7, where 1 meant "I never do that" and 7 meant "I always do that". The data collected shows as activities more frequently conducted via mobile the following: to read e-mails (mean=4,17; SD=2,264), to access social networking sites (mean=4,24; SD=2,313), to search information about maps, paths or roads (mean=3,74; SD=2,352), use chats (mean=3,89; SD=2,293), use geo-location applications (mean=3,64; SD=2,333). In order analyze the whether there is any influence of the type of access on the activities performed online, we conducted a multidimensional scaling analysis in order to examine the proximity (similarity/dissimilarity) between the activities analyzed in the inquiry, intending to examine groups or types of activities that are more frequently done via mobile. The values of proximity were calculated based on the answers to this item in the inquiry (5.1.), using the algorithm Proxcal. According to MDS analysis assumptions, three dimensions were retained in order to reproduce properly the perceived similarities between the activities (STRESS-I=0,129, DAF=0,983). The following figure illustrates the three-dimensional perceptual map.

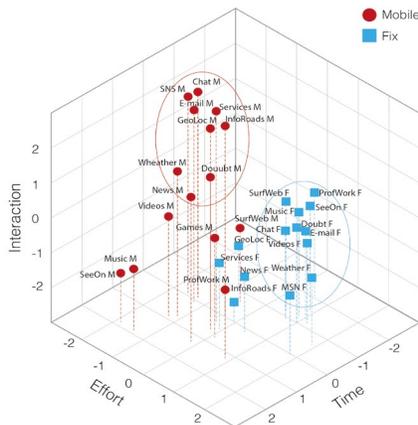


Figure 1. Online Activities- Three-dimensional perceptual map (Euclidean distance model: STRESS-I=0,129; DAF=0,983).

Regarding the perceptual map, we can see the activities conducted online via fixed or mobile access to the internet distributed spatially according to its similarities (based on the respondent's answers) in a special map with three dimensions to each we will call: dimension1 - interaction; dimension2 - time; dimension 3 - effort. Examining the graphic, two main groups of activities emerge, while the remaining activities are distributed randomly within the graphic space. The two main groups are located at the superior left and at the superior right part of the perceptual map.

The superior left part includes the following activities conducted via mobile internet access: using the e-mail, using social network site using geo-location applications, using online services, searching information about maps, paths or roads, using chats. If we analyse the values obtained in these activities, we can see that such type of activities are the ones with higher values and more conducted via mobile access. Regarding the superior right part of the perceptual map, we will find another group of online activities, such as: downloading music, settling a doubt, looking for someone online, performing professional/ work searches online, watching videos online; that present higher scores on the fixed internet access.

The perceptual map points to the distinction of two main groups of activities: one more related to the fixed access and the other one more related to the mobile access. Interpreting this data and considering the dimensions conceptual meaning, one can say that the activities more frequently done via mobile access commonly imply communication and participation, such as using chats, e-mailing, using social network sites, and activities that need to be done on the go, such as searching information about streets, roads or maps, used when someone is lost or is trying to find a new place. On the other side, the activities more frequently done via fixed access are normally activities that take more time to be performed, imply higher levels of attention or knowledge.

The survey also included a scale that analyzed the levels of satisfaction and participation of participant with online experience (Cronbach $\alpha=0,897$). This question allowed us to examine whether these variables have any influence on the decision of using m-internet and, if they have a significant influence, whether they could be predictor variables to classify, a priori, new individuals as possible adopters or non-adopters of m-internet. In order to test this hypothesis used a Wilcoxon-Man-Whitney test, since the assumptions for a parametric test were not fulfilled. According to the data, there are significant differences for a confidence level of 95% ($\alpha=0,05$) for satisfaction and for participation between the group that use m-internet and that don not use m-internet (satisfaction: Man-Whitney $U=34285,000$; $p<0,001$; $N=1107$ and participation: Man-Whitney $U=38243,500$; $p<0,001$; $N=1107$). The following table shows the descriptive data for each variable - participation and satisfaction - in each group - use m-internet/ do not use m-internet. As it is possible to observe, the levels of participation and satisfaction are higher for the individuals that use m-internet, which indicates that these individuals are more satisfied and participate more in their online experience.

Table 1. Descriptive data for participation and satisfaction

m-Internet access		Mean	Std. Deviation	N
NO	Satisfaction	3,42	2,212	933
	Participation	2,90	2,034	933
YES	Satisfaction	5,57	1,112	174
	Participation	4,78	1,334	174
Total	Satisfaction	3,76	2,219	1107
	Participation	3,19	2,058	1107

Since there is a statistical significant effect of participation and satisfaction on the choice of using or not using m-internet, we also questioned whether these variables could work as predictive variables for the adoption of m-internet. Therefore we performed a discriminant analysis, after confirming its assumptions, in order to understand the predictive value of participation and satisfaction in this technology use.

The data specifies that there are significant differences between the groups for both variables, indicating that participation and satisfaction have a significant discriminant power on the decision to use m-internet (satisfaction: $F_{1,1105}=155,837$; $p<0,001$; $\Lambda=0,876$; participation: $F_{1,1105}=138,064$; $p<0,001$, $\Lambda=0,889$). The discriminant function is constituted by both satisfaction and participation variables and data indicates it corresponds to 100% of variance explained in terms of differences between groups ($\lambda=0,142$). This function discriminates significantly between groups ($\Lambda=0,876$; $\chi^2(2)=146,562$; $p<0,001$).

The following table presents the standardized coefficients of these variables in the discriminant function, the significance of the function, and the percentage of variance explained.

Table 2. Discriminant function: standardized coefficients and explained variance

Variable	Discriminant Function
Satisfaction	0,822
Participation	0,193
Eigenvalue	0,142
Explained variance	100%

The analysis indicates that the percentage of original grouped cases correctly classified is 74,2%. Validation with the stepwise method, removes the variable of participation since it presents a lower percentage of explained variance, and presents a model that was able to classify correctly 84,3% of original grouped cases. However, due to the theoretical background that supports this approach and to the results concerning the activities performed on m-internet, we opted to keep this variable in the model.

6. Conclusions

The results of our study show that social factors exert an important influence on people's decision to adopt advanced mobile services and they should be viewed as an antecedent of constructs explaining the adoption of m-internet. Such social factors do not seem to be determined by utilitarian views of services emanating from the industry but by expectancy values built via social interaction namely communitarian one. The satisfaction of needs has been traditionally considered one of the main drivers for technological innovation. What our results show is that although this is true, satisfaction is understood differently by users' and stakeholders with the first group associating it with a social use of the technology and the second with its individualistic function. These opposite formulations indicate that drivers of adoption are similarly drivers of rejection if a larger socially mediated frame is considered. At the same time, indirect external effects of the network shape the activities that drive users' behavior and not expectancy values directly associated with the consumption of the technology.

Our findings show that the activities performed online are more similar to the activities associated with mobile phone use patterns than with the fixed internet, as users' main activities are related to connectivity and coordination. Thus, smartphones and other portable devices, which afford access to m-internet, are more adequately viewed as extensions of the mobile phone than of the fixed computer with internet access, in the same way as the mobile phone extends the telephone. Thus, m-internet is primarily used for satisfying love and esteem needs.

In addition, our research shows that the concepts of participation and satisfaction are as connected when it comes to m-internet as the concepts of uses and gratifications regarding mass communication media such as the television. This notion alludes to an approach to satisfaction as inherent to online participation, being therefore intrinsic to social interaction. In the same way that watching television may satisfy, for instance, surveillance needs, in a gratifying way, so does interacting in a social network afford, at the same time, the satisfaction of love and esteem needs as well as satisfaction resulting from performing an enjoyable activity. Mobile access to the internet enhances this participation and satisfaction by facilitating social interaction anytime, anywhere.

Our research reports on participation and satisfaction being not only variables that explain the diversified use of the internet whether the access is fixed or mobile, as m-internet users participate more in online communities and are more satisfied with their use experience, but also as relevant in what concerns m-internet adoption. Such needs are not similarly understood by stakeholders that regard the adoption process more from a determinist fashion that posits that the fruition of services is enough indicator of satisfaction. On the one hand, participation and satisfaction are key drivers for m-internet adoption, as there is a significant relationship between these variables and the use of m-internet. On the other hand, as expectations and perceptions towards both possibilities of participation and obtaining satisfaction play a relevant role in the choice of adopting m-internet, these variables are also predictors of m-internet adoption. Thus, users who already have an internet use profile related to connectivity, networking, sociability and sharing – users that an IBM report on internet use classifies as social butterflies (Berman & Kesterson-Townes, 2011) – are more likely to adopt m-internet in order to facilitate the activities that they already perform.

Concerning future research, we intend to further explore the relationship between participation and satisfaction and technology adoption. The literature shows that these variables are relevant to technology adoption in general, but we intend to further explore its impact on the adoption and use of digital technologies. As uses and gratifications explain the mass media consumption, we intend to further explore the hypothesis that participation and satisfaction are the determinant variables that explain digital media adoption and use. At the same time, the clash depicted between different actors within the network call for further research on the ongoing exchanges of social capital and the externalities resulting thereof.

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