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TO WHOM IT MAY CONCERN

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Factors impeding the use of mobile internet in developing countries: case of South Africa

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Abstract

Mobile internet is seen by many as the solution to the present internet access limitations in developing countries. To ensure the success of the technology, there is need to understand not only the factors that drive its uptake, but also the factors that may hinder its adoption and use. This study looks at the factors that inhibit the use of mobile internet in the South African context. Data for the study was gathered using semi structured interviews with 27 participants. The study noted adoption of mobile internet in developing countries may be affected by (1) the limitations inherent in the mobile phone itself, (2) reliability of the network, (3) lack of mobile phone related content and (4) social discourse around some of the applications.

1. Introduction

Despite efforts to make the internet available to the masses, the majority of the people in developing countries still lack access to the internet. For example, only 10% of South Africans have access to the internet (Internet World Statistics, 2006); that is despite South Africa (SA) having one of the highest internet penetration rates in the Sub-Saharan Africa. To make things worse, most of those with physical access to the internet; lack the willingness and the capability to effectively use the technology. Some argue that it is not the internet *per se* that is a problem, but rather the mode of accessing it (i.e. the traditional access) that is problematic. The problems with the traditional internet access include the cost of providing the physical infrastructure and complexity of use. Traditional internet access requires, amongst other things, a fixed line telephone and a computer. Unfortunately, both these are scarce commodities in most developing countries. SA, for instance, has a fixed line penetration rate of a meagre 10.1 lines per 100 people (ITI, 2006). This makes traditional internet access out of reach for the majority.

In the face of the internet access problems, many see mobile internet as the solution. For instance, ITU (2004) notes that “mobile technology has the power to drive the uptake of the internet”. Since mobile networks do not require fixed infrastructure, it can be connect geographically remote places. With cellular covering almost 96% of SA (Bridges.org, 2006) and mobile phones outnumbering PCs and fixed lines in a growing number of developing countries, mobile phones have become the perfect platform for delivering internet services, particularly to previously under-served areas (Critical Friends of Technology, 2003). For this reason mobile internet is hailed as a potential solution to narrow the digital divide (Mphidi, 2004; ITU, 2004; Bridges.org, 2006).

Research on mobile internet in developing countries has mainly focused on the factors which lead the adoption of the technology. In this paper, we argue that factors that affect the adoption of an innovation are not necessarily the same as those that the affect lack of adoption. Our position is similar to Ma and Qi (2005) who argue that the

factors that affect adoption of an innovation are not necessarily the opposite of the factors which influence adoption. The rationale of such a claim is based on Herzberg's Two Factor Theory (Herzberg, 1968). According to Herzberg's theory, the factors whose absence may inhibit uptake but whose presence may not necessarily increase uptake are called hygiene factors. On the other hand, factors which may motivate an uptake of an innovation are called motivators. We argue therefore, there is need to investigate factors that may hinder the uptake of the technology. In this study we raise the following questions: (1) what factors hinder the uptake of mobile internet? (2) How different are these factors from those that hinder the uptake of traditional internet? Answers to these questions will contribute towards seeking solutions to improve the uptake of mobile internet in developing countries. Our focus on factors on inhibiting factors is similar to Brown et al (2006) who focused on factors affecting non-adoption of T-Commerce (as opposed to factors affecting the adoption of the technology). Bouwman, Carlsson, Molina-Castillo and Walden (2007) also addressed barriers to adoption as separate from drivers to adoption of mobile services.

Data for this study was obtained for two separate studies which focused on the adoption and use of mobile internet amongst different sectors of the South African economy. Results for the other studies were published elsewhere [reference to publications withheld due to blind review requirements]. The data has been reanalysed, this time the focus being on the factors which impede on the adoption and use of the innovation.

Mobile phones offer a wide variety of functionality, however, this research is only confined to the mobile internet functionality. In addition, we acknowledge that the term mobile internet includes a wide range of wireless networks such as WiFi, RFID and WiMax (Balacco, Mogre & Toletti, 2009), however, in this paper we only focus on the use of mobile internet via the cell phone. In addition, this excludes the access of internet via other mobile devices such as PDAs. We are aware that mobile phones are also used as modems to connect PCs or laptops. However, this study excludes such use of mobile internet because it is only realisable for the minority who can afford PCs.

2 Background

2.1 The South African cellular phone market

The adoption of mobile phones in Africa and in SA in particular has been phenomenal. The number of mobile users in Africa grew from 7.5 million to 76.8 million over a period of 10 years (1994 to 2003). This represents a 58% annual growth rate. In comparison, Asia grew by only 34% (LaFraniere, 2005) over the same period. SA accounted for nearly one fifth of the growth on the African market. The South African market consisted of approximately 14.4 million mobile subscribers at the beginning of 2003 (South Africa.info, 2003). At the end of year 2006 this figure had grown to 35.9 million (The e-Business Handbook, 2006).

Like in most countries, mobile phone users in SA have the option of either a fixed or a prepaid (pay as you go) contracts. To qualify for a fixed contract, a customer must have a good credit record and must provide proof of income above a minimum required amount. As an example, Vodacom (the mobile network provider with the biggest customer base) requires a minimum gross monthly income of R3500 (Chigona, Kankwenda, & Manjoo, 2008). With the DGP of US\$270 and unemployment rate of between 36% - 42% (Oyedemi, 2009), the minimum required amount for fixed contract is out of reach for the majority.

Fixed contracts are generally taken over a 24 month period. Three months prior to the end of a contract, customers are offered the option to upgrade their mobile phone

(Vodacom, 2006). This means that the customer acquires a new phone and in essence takes out a new contract. One of the main reasons customers upgrade their contracts is to keep their current mobile phone number. With contract-induced upgrades, it is likely that mobile phone users end up with functionality that may not be needed.

Although contracts offer lower rates, prepaid plans are more flexible as the customer is not locked in. It is not surprising, therefore, that prepaid packages are more common. In fact, the introduction of pre-paid subscriber packages is one reason cited for the acceleration in the mobile market (South Africa.info, 2002). For example, the number of prepaid subscribers grew by 12.2% in just three months (September to December 2005). In comparison, the number of contract subscribers grew by only 7.7% over the same period. One of the reasons why prepaid packages are so successful is that they are affordable to low income people (Piertse, 2002).

2.2 Mobile internet technology

Our topic requires us to define the term mobile internet. Mobile internet can best be described as a means of “wireless access to the digitised contents of the internet via mobile phones” (Chae & Kim, 2003, p. 240). When the internet is accessed, a request is sent by an internet browser to a web server, which responds by sending the information to display on screen (Beal, 2006). Because voice calls and SMS’s do not query web servers, they cannot be classified as mobile internet. There are four main ways that mobile internet can be used: E-mail, Access to general information, instant messaging services, and Voice-over-internet-protocol.

Due to technological limitations, the earlier generations of mobile phones (1G and 2G) can only support voice transmission and are not ideal for data transmission. For instance the 2G networks can only support data transfer at the rate of 9Kbps. After 2G came GPRS (Global Packet Radio Service); GPRS is referred to as 2.5G since it is considered an enhancement to GSM and not a completely new network. Theoretically, GPRS offers speeds of 115kbps to 160kbps. However, in practice 45kbps is the norm. This is not a huge improvement from GSM speeds, however, GPRS does offer lower costs as it is based on data volume, rather than time (Crandall & Alleman, 2002). EDGE (Enhanced Data Rates for GSM Evolution) is termed 2.75G and offers theoretical speeds of 400kbps. However, in practice 210kbps is more commonly attained (Crandall & Alleman, 2002).

The next step in the evolution process is 3G. 3G uses high infrastructure, networks and handsets to allow phones to deliver high speed internet access (384 Kpbs). Due to the high bandwidth, 3G is capable of supporting data intense communication such as live video calls, television broadcasts and CD-quality music services” (Crandall & Alleman, 2002). Since 3G offers a convergence of mobile services and traditional internet (Pedersen, 2005; Balacco, 2009), it can be said that 3G has great implications for mobile internet access. According to a web study conducted by Ipsos Insight, a market analysis company, 28% of global mobile subscribers are now using their phones to browse the internet (Church, Smythe & Keane, 2006).

Although 3G is not yet established in the market, South African mobile network operators have started to roll out 3.5G. This technology uses HSDPA (High Speed Downlink Packet Access) to improve on 3G by providing theoretical speeds of up to 10Mbps. However, in South Africa speeds of up to 1.8Mbps are more common. This exceeds the 1Mbps speed as offered by fixed line connections. By launching HSDPA before Europe, South Africa has surpassed global operators and become the leader in the mobile market (Weber, Bohlin, Lingmark & Wingert, 2004).

The latest revolution in cell phone technology is the introduction of 4G. This will allow for

data transmission speeds of 100Mbps to 1Gbps (Weber et al, 2004). In 2006 tests conducted by the Japanese Group DoCoMo showed that it was possible to reach speeds of 2.5Gbps (NTT DoCoMo, 2006). 4G is dramatically enhances the capabilities of 3G networks and provide new innovative mobile services (Frattasi, Fathi, Fitzek & Prasad, 2006). Table 1 summarises of the different digital technologies and the theoretical speeds they offered.

Table 1: Theoretical speeds of digital technologies

Technology	Generation	Theoretical Speed
GSM	2G	9 kbps
GPRS	2.5G	115kbps -160 kbps
EDGE	2.75G	400 kbps
UMTPS	3G	384 kbps
HSDPA	3.5G	10 Mbps
HSUPA	3.75G	10 Mbps
	4G	100 Mbps-1Gbps

While it is clear that cellular technology is growing at a rapid pace, it is not clear whether consumers are ready for the evolution to 4G and beyond. Nevertheless, it is interesting to explore whether people are aware of these different technology.

2.3 Adoption and uses of mobile internet

Research on the use of mobile internet has addressed the adoption, the use and the impact of the technology. The studies on adoption could be divided into two main categories (1) organisational adoption and (2) individual adoption. Balacco et al (2009), for instance, focuses on the factors which affect the adoption of mobile internet amongst small and medium enterprises (SMEs) in Italy. The studies which have focused on the mobile internet adoption amongst individuals have looked at the factors which may or do lead to adoption. For instance, Urbaczewski, Wells and Sarker (2002) posit that factors which affect adoption may depend on the cultural context. Before 3G was introduced in SA, Richards and van Belle (2006) analysed the factors which may determine the use of 3G mobile video amongst South Africans. Chigona et al (2008) looked at the uses and gratifications of mobile internet amongst South African [university] students. The findings of Chigona et al (2008) concurs with those of Bosch (2008), Kreutzer (2009) as well as Donner and Gitau (2009) that one of the main uses of Mobile Internet in South Africa is MXit- a popular mobile instant messaging application. The studies have shown that apart from creating social image, the main driver for the adoption of MXit has been the cost: chatting is considered cheaper than sending SMS or calling; for a price of one SMS, one can send over 50 MXit messages.

Research shows that one of the main drivers of internet adoption is convenience – using it any place any time (Stafford & Gillenson, 2004). Convenience has also been noted in the ease of applying for connection, unlike with traditional internet, subscribers do not need to enter into a contract with a mobile subscriber in order to access the

internet. Studies from developing countries show that cost may also be considered as a driving factor for mobile internet adoption (Chigona et al, 2008).

Another stream of studies on mobile internet is on the use and impact of mobile internet. Bosch (2008) focused on how Mxit impacts on the image construction and interaction amongst teenage girls. Chigona, Beukes, Vally and Tanner (2009) explored Mobile Internet can be used to address social exclusion amongst the urban poor in South Africa. According to Chigona et al (2009) the impact of mobile internet is not as high as is often portrayed by the popular press.

Most of the adoption studies have primarily focused on the factors which influence adoption, (i.e. in the language of Herzberg theory, the motivators) and have largely ignored or mentioned in passing the factors which may hinder the adoption (i.e. the hygiene factors). According to the existing literature the factors which may hinder adoption of the mobile internet are by and large related to the mobile phone itself. Most studies point to the fact that the mobile phone is limited in terms of screen size, memory capacity, processing power and keyboard (Donner & Gitau, 2009; Daugherty, Eugster, Roche & Stovall, 1999). Other studies have also mentioned the network limitations as an inhibiting factor (Sun, Sauvola & Howie, 2001).

The review of the literature shows that there is growing interest in mobile internet in developing countries. However, the studies to date have focused on the factors affecting adoption. There is, therefore, still a void on studies focusing on factors which hinder adoption of mobile internet in developing countries.

3. Research methodology

The results presented in this paper are part of a broader study seeking to identify factors affecting the adoption of mobile internet in a developing country context. Data for this paper was specifically collected for two separate studies. The first study, which was conducted between July 2007 – January 2008 focused on the uses of mobile internet amongst university students in SA. The focus of the second study was an investigation of whether mobile internet may be used to address social exclusion. Data for the second study was obtained through semi-structured interviews with people who are perceived to be socially excluded. Data for the second study was collected between July and September 2008. In both cases the interviews lasted on average of 45 minutes.

The combination of the data from the data from a student sample, which according to some studies, forms the early adopters of mobile technology (McClatchey, 2006) on the one hand and socially excluded people allowed us to have a diverse sample to draw our conclusions from. We acknowledge that the small sample of 27 respondents may not be big enough to make generalisations. However, it is not our aim to make generalisations, our focus is rather to raise potential themes which can be further explored in a more detailed study.

For this paper, we reanalysed the interview transcripts and the field notes. This time we focused on the factors which were perceived to impede people's use of mobile internet. The data was analysed using thematic analysis. Thematic analysis is defined as "a method for identifying, analysing and reporting patterns (themes) within data" (Braun & Clarke, 2006: 79). We first familiarised ourselves with the data by going through data several times. Themes were then identified from the data; a theme identifies a feature of the data that appears to be interesting or significantly tied to the research questions. This paper focuses only on themes which are related to hygiene

factors.

4. Findings

The inhibitors identified in this study were grouped into four categories as follows: mobile phone related, problems related to web content; problems related to the network and social discourse and beliefs about the mobile internet. These categories will be discussed in the subsequent sub-sections.

4.1 The limitations inherent in the mobile phone

The problems attributed to limitations of the mobile phone ranged from hardware limitations to setting up the phone for mobile internet usage. Consistent with previous studies on mobile phones, a number of respondents complained about hardware limitations of mobile phones and how they (the hardware) make using the mobile internet a pain. For instance, most indicated that they find the screen too small and this requires too much scrolling, some indicated that if they had a screen like on a Black Berry they would use the internet more. Other complaints about the hardware were about the size of the keyboard and the keys. Some the respondents believed that there is too little memory on phones which, in turn, places limitations on the amount of material that can be downloaded and stored on phones. The lack of printing capabilities was also cited as limiting factor; a respondent said he was forced to go to an internet café to print. Two respondents indicated that complications in connecting their mobile phones with PCs limits their use of mobile internet (i.e. using the mobile internet as a modem). For instance, a student respondent indicated that he could download course notes using his mobile internet if he could connect it to the PC. Respondents also indicated that the impact of mobile internet on the battery life affects their use of mobile internet. A respondent indicated that Mxit

“damages your cell phone battery ... before I began using Mxit, my battery would last days. Then I began using Mxit, the battery would last [just] hours. That’s why I stopped using it. My battery is damaged; even now it still last just hours ... but I am told the new version [of Mxit] is better”.

The complication of use also came from the fact that most mobile phones do not support applications which may be necessary to view some data from the internet. Particularly, respondents indicated that they had no applications to open PDF or word documents. It is therefore, according to the respondents, difficult to send an email with an attachment (say to apply for employment).

Most respondents claimed that it was difficult to set up the phone for internet use. Most of the students in our sample indicated that *“it is straight forward”* to set up the mobile internet functionality on their phones, however, the other respondents experienced problems. One respondent indicated that she managed to set up the functionality successfully, but it suddenly *“turned off”* and she was unable to reset it. Others indicated that the level of difficulty is dependent on the brand.

The findings also show that mobile internet was difficult to use especially for novice users. Even those who claimed that they had no difficulties indicated that it required time to acquire the necessary skills to use the technology. A number of respondents indicated that they relied on other people to help them install applications on their phones. One respondent claimed that he struggled to do most of the things on the mobile internet and relies on his younger brother who *“is too much into computer stuff”* to help him. This was interesting because the respondent was himself a second year Information Systems student. Respondents also expressed difficulty or anxiety in installing application on their mobile phones.

4.2 Availability of mobile phone friendly web content

Almost all respondents expressed dissatisfaction with the presentation of web content on cellphone screens. The main problems raised include: (1) web pages not being formatted adequately for small screens, (2) navigation is painful and (3) the presentation is not the same as the original website. Most of the students in our sample complained about the UCT website. Some could not access it at all and others had difficulty extracting information from it. Some student respondents indicated they were forced to use internet café to check the UCT examination results even though they did not like using cafés. In the vocabulary of two factor theory, the respondents were not using the mobile internet for accessing the UCT website, for example, “to avoid the pain” of reading the badly formatted content. Some respondents indicated that they downloaded a web browser called ‘Opera Mini’ which allows almost any web page, including the university one, to be displayed on a mobile phone. However, most respondents were not aware of the application and relied on the browser which came with the phone. There were general consensus amongst respondents that mobile internet is good for viewing pages with little information such as the weather report or MXit, but not suitable for large pages with large volumes of information.

The problem of content display is, to an extent, related to the limitation of mobile hardware. However, we decided to code it as a separate theme because it also relates to lack of availability content specifically designed for mobile screens.

4.3 Network coverage and performance

Most respondents complained about reliability of mobile internet. Four main concerns raised were (1) randomly being disconnected, (2) difficulty finding a strong enough signal, (3) speed of the internet and (4) availability of webpages. The respondents indicated that frequent random disconnections are frustrating particularly when one is busy. Though not unique to mobile internet, but rather to the all mobile phone services, the respondents noted that the weak signal affected their internet experience. Weak signals prevents users from connecting to the internet. A student respondent complained of lack of network in the lecture theatres. One respondent stated that trying to find a signal “*is difficult and just not worth the effort*”.

The internet speed was also raised as a concern albeit the views were mixed. Only a small group of respondents believed that mobile internet is fast, particularly on 3G-enabled phones. The majority of respondents, however, believed that mobile internet should be faster. These respondents claimed that mobile internet is fast, but only at “*the most obscure times*”. These times include the very early hours of the morning. In particular, respondents complained about the time it takes to download web pages and access mobile internet during peak times. One respondent indicated that she avoids using mobile internet during the day due to speed and prefers to rather calling or sending SMS. Interestingly, Stafford and Gillenson (2004) identified speed as one of the primary motivations for mobile devices use amongst Executive MBA students. The difference in results could be attributed to the actual speeds offered by mobile networks in different countries.

The fourth issue about the network reliability dealt with the ability to connect to specific pages. Respondents sometimes experience “*Page could not be found*” errors. The respondents attribute all these issues to network problems. Some respondents claimed that the direct cause of these issues is the network being overloaded. Even though the problem of dead links is not unique to mobile internet, we posit that individuals

accessing the internet from a mobile internet would feel the frustration more than someone accessing the internet from the comfort of a PC.

The reliability concerns have been mainly attributed to the network being overloaded. It is therefore necessary that mobile network providers address these concerns.

4.4 Social discourse and beliefs about the technology

We also noted that public discourse as well as perceptions of the use of mobile internet applications affected the degree to which mobile internet was used. Some respondents indicated that they do not use the mobile internet to apply for jobs because they, based on their prior experience, job applications sent via the mobile phone “*are not taken seriously by the [potential] employers*”. We suspect that this might be coincidental, but never the less such perceptions may negatively affect the adoption of the technology. We also noted that the negative publicity of MXit had a negative impact on the use of that application. In responding to why he no longer uses MXit, a respondent said:

“Yes [I used to use it] but it’s long ago now I no longer use it. ... everybody started using it and they are using it for wrong reasons so I think am not in that category. ... I used to use it because I wanted to communicate with my friends because it is cheaper, but now when people see you there they associate you with wrong things thinking you also participate in such things. So no I stopped. I don’t want to be part of that.”

The “wrong reasons” the respondent is referring to are numerous incidences reported in the media – for instance it has been claimed that paedophile use the mobile internet to lure youngsters (Chigona & Chigona, 2008). Chigona and Chigona (2008) attribute part of the bad image on MXit to moral panic propagated by the media. While this may appear trivial since it affects only a particular application, we would like to argue that the discourse may affect the adoption and use of the entire mobile internet. For instance, Donner and Gitau (2009) show that some people discovered the internet accidentally by following hyper links on their MXit messages. Furthermore, the discourse and its impact may stop people from using the MXit or acquiring phones for their children. For instance, one respondent indicated that “*because of this MXit thing, I did not want to buy a phone for my son, I only did it because my other children forced me to do it.*”

5. Discussion

This study has identified a number of factors which may impede the use of mobile internet in the developing country context. These factors along with the possible solutions are summarised in Table 2.

Table 2: Summary of inhibiting factors

Factor	Comment
Problems inherent in the phone	User centered design – conscious of the developing countries circumstances Improvements in phone hardware
Network problem	As technology moves to 4G and as 3G becomes widely spread this will be addressed. Improve network coverage
Content	Organisations should be conscious that

more and more users are accessing content via mobile devices. There is need to provide more mobile compatible content.

Improve on mobile browsers – more like Opera Mini

Social discourse

Moral panic will eventually die off

Training

The departure point for this paper was that mobile internet may help reduce the digital divide. To answer this question one would have to look at the factors which are necessary for a technology to have a social economic impact. Studies which deal with the use of ICTs to alleviate the effects of social exclusion point out that there are five prerequisite steps before a technology can have an impact. The steps are: physical access, awareness, training, use and then impact (Foley, 2004; Chigona et al, 2009). Warshauer (2003) posits that access should not be looked at only from a physical perspective but also from the point of view that the person is socially and cognitively capable to make use of the technology. The findings of this study show that even though the mobile internet may provide the physical access, the other prerequisites needed to ensure impact of the mobile internet are may not, in most cases, be guaranteed. The study shows that the hardware limitations as well as the network limitations limit the availability of the mobile internet to the users.

The findings show that the complexity of setting up the mobile internet and using it is a hygiene factor for mobile internet usage. Whilst the findings do not suggest any difference in mobile internet usage based on gender or age, it appears that experience appears to affect usage; those with less experience struggle to set up the mobile internet. Most respondents agree that it is easy to use mobile internet but *only* if “you’ve experienced it before” or are “somewhat familiar with the technology”. This finding is consistent with existing literature on mobile internet adoption. This means that a considerable amount of people may, in the words of one respondent, “*be dying of thirst while their legs are in the water ... because they don’t know how to draw the water*”. Bouwman et al (2006) as well as Heres et al (2004) indicate that ease of use positively affects the use of mobile internet. This limitation may be addressed by the use of training (Nishimura, 2008). Cell phone manufactures may also consider providing detailed instructions or interactive help features to aid new and unexperienced users. Standardising settings or providing phones with preconfigured settings may help ease the problems.

One of the underlying themes through most for the impeding factors is lack of awareness and skills amongst the potential users. Most users did not know how to set their internet browsers, most of them were not aware of the internet browsers such as Opera Mini. Almost all respondents are unaware of the differences between connectivity technologies WAP, 3G and GPRS. Some believe that they have all these technologies on their mobile phones. Of the few who are aware of these differences, their knowledge of these technologies and how they affect their mobile experience is limited. Although they are aware that different technologies exist, they remain oblivious of differences in speed and charging mechanisms. It is important that mobile internet users are educated of these features, particularly those that affect the speed and cost. This is necessary

since technology affects the mobile internet experience. Better informed users will be able to better judge whether or not a particular phone meets their needs.

Accessibility of the technology may also be considered from the point of view of the availability of content. Here our concern was not on limited content in African languages, but rather on the lack of mobile phones friendly content. One of the problems identified in this study was that some web pages are not formatted specifically for mobile devices. This forces some users to seek alternative access methods. Considering that mobile access is, in some cases, the only access some people may have and considering that the demand for mobile content appears to be on the rise, there is need to seek solutions to this problem. Solutions to the problem can take two directions: (1) developing and marketing internet browsers which can handle standard web formats and (2) as one respondent suggested, “*mobile web can be expanded by creating content specifically designed for mobile phones*”. Examples of the former option include Opera Mini. Our study noted that only few respondents are aware of the application. This implies, there is still need for more marketing of such applications. It is interesting to note that an increasing number of organisations are now providing their websites in mobile phone version.

6. Conclusion

Mobile phone technology has advanced rapidly and continues to do so. The cell phone has become one of the most important communication, social, business and entertainment devices of the 21st Century. One of the new features on the mobile phone is the mobile internet. Mobile internet has the potential of increasing the uptake of internet in developing countries and thereby addressing the problem of the digital divide. To ensure the chances of technology succeeding there is need to understand not only the factors that lead to adoption, but also the factors that may hinder the adoption. This study focused on mobile internet. The purpose was to understand the factors that may inhibit the uptake of mobile internet in the South African context.

Using the hygiene factors paradigm, the study noted that other factors which are intrinsic to the internet may hinder the success of the technology. Such factors include the network performance, the availability of mobile phone-friendly websites as well as the social discourse around some mobile internet applications. Some of these factors, such as presentation of the content, reliability of the network can easily be addressed. However, some of the problems such as hardware limitations and social discourse are not easy to address.

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