

T-Commerce: an Investigation of Non-Adoption in South Africa

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Abstract

This paper describes an exploratory study into the reasons why T-Commerce has not taken off in South Africa. Although more South African households own TVs than computers, there has been little or no adoption of T-Commerce contrary to its success in Europe and the USA. The study adopted a qualitative approach to investigate this through interviews with nine users and five providers. Relevant determinants of the non-adoption of T-Commerce were found to be negative perceptions about performance expectancy, effort expectancy, social influences and limited facilitation conditions in order to conduct T-Commerce. These determinants were found to be moderated in various degrees by access levels to DSTV, income and age. However, the two main reasons for non-adoption of T-Commerce were a lack of awareness on the side of the consumers and the high costs from the vendor perspective.

Keywords: T-Commerce; technology adoption; interactive TV; i-TV; non-adoption; adoption factors.

Introduction

Digital TV is based on traditional analogue TV but adds another dimension in which interactive features are included (Stewart, 2003). T-Commerce, a subset of interactive TV, started with technical trials in the United Kingdom in 1997. Interactive TV can change the TV medium from a passive, low involvement medium to an active, high involvement medium that encourages viewers to purchase products and interact with the TV screen (Kingsford-Smith, 2003). The ideal i-TV target should be a 50/50 gender split with an age range of 16-34 years. T-Commerce is very useful from a marketing perspective. It enables marketing organisations to use profiling engines to track procuring habits of consumers. This information can be used to analyse consumption patterns of viewers and helps them develop more targeted offerings and enables them to sell products that are of interest to the individual viewer (Ackerman, 2002).

In the UK, travel agents are now offering their products over digital interactive TV, allowing customers who do not have access to computers to book their tickets through the TV medium. DigiQuote, a product of Digisoft allows Insurance and Assurance companies to sell via interactive TV (Digisoft, 2004). Gamblers are able to place bets. TV viewers can play the lottery and even pay for their TV services over their TV (Digisoft, 2004). Visionik (2005) adds that T-Commerce enables interactive advertising and makes TV advertising more compelling.

The i-TV experience should be simple since it uses the familiar remote control. Also, it reaches a wider audience than the internet. A TV is more familiar than a PC to many

users and this might lead some users to feel more comfortable initiating their T-commerce transactions over their TV (Digisoft, 2004). Shapshak (2002b) summarizes these advantages by stating that it is comfortable, familiar and convenient, and it also introduces limited Internet abilities into the living room, whereas computers are typically hidden away in studies, only used at the office or simply inaccessible. For current users of Internet based services, it is a leap ahead in convenience. What is particularly relevant in the South African context is that Interactive TV has the potential to reach a much larger consumer market.

T-Commerce adoption has been successful in the USA and Europe. However, little can be said about adoption in the South African context. A previous study, *T-Commerce - The Awareness and Adoption in South Africa* by Brown *et al* (2003) found that there was a low adoption of T-Commerce in South Africa.

The purpose of this study is to investigate the non-adoption of T-Commerce in South Africa and to find explanations for this. Furthermore, the research should provide insight as to the factors leading to consumer's non-adoption.

This study should be of practical value to providers of T-Commerce and businesses that are considering marketing their products via a T-Commerce channel. To the research community, it should shed interesting light on why some technologies can be successful in one country yet not take off in another.

Literature Review

Shapshak (2002a) predicted that T-Commerce could increasingly replace computers as a medium for Business to Consumer commerce by 2005. This prediction was based on a number of success stories, especially in the United Kingdom. *"Products available on the TV-Shopping channel are generally low cost, fast moving goods which require low consideration, for example, books and CDs. Additionally, there are beneficial branding opportunities for retailers who can gain high awareness and exposure to products via television. T-commerce opens up enormous opportunities for new ways of advertising and branding to consumers. This will develop and expand into the future"* (Shapshak, 2002a). Multichoice, based in South Africa, made history as the first interactive TV offering a service from Africa for Africa. Since its launch in July 2002, i-TV has been extended to over 50 other African countries where Multichoice has a presence (Letele, 2003). South Africans wishing to use i-TV need to be a Digital Satellite Television (DSTV) subscriber. Its high cost implies that only the wealthier segment can afford access (Tagg, 2001). Shapshak (2002b) believes T-commerce in South Africa will provide a new means of reaching untapped segments of the market and acquire a greater share of consumer attention. However, there is still considerable confusion in the market with respect of i-TV. SADIBA (2002) suggests that this confusion could be due to analogue TV, such as SABC being a mass market TV delivery medium, whilst pay-TV is very much a niche market offering. Despite the lack of knowledge of i-TV in South Africa, Letele (2002) argued that TV shopping is showing great promise.

Micro Problems

South Africa has many unique micro problems that may hinder the adoption of T-commerce in South Africa. Micro problems are those that affect a person on an individual level.

Lack of Access to DSTV

Only DSTV subscribers have access to digital TV, therefore only they can engage in T-Commerce. Armstrong & Collins (2004) claimed that this amounted to roughly only 600 000 households that own a satellite dish, a set top box and pay a monthly subscription to DSTV. Therefore the total South African target market that is able to engage in T-commerce is already reduced to merely 600 000 households.

Lack of Perceived Secure transactions

Security can play a major role when transacting online, whether the transaction happens over your personal computer or your TV. Factors such as the lack of technologies or the “perceived” lack of technologies to support a secure transaction can hinder the adoption and growth of E-Commerce (Barnard & Wesson, 2003). This would hold true for T-Commerce too, as there is a clear link between the adoption of E-Commerce and T-Commerce.

Complexity of Input Devices

Remote controls differ from system to system. TV viewers often complain about needing different remotes for different functions. Furthermore, multi-modal buttons are confusing for users. The more functionality that is required, the more buttons are needed. This may cause buttons to become cramped on the remote, resulting in the user pressing the wrong keys and thus contributing to the user’s perceived complexity of the input device (Perera, 2002).

Macro Problems

The following section relates to macro factors that contribute to the non-adoption of T-Commerce.

Lack of Migration from Analogue to Digital

Although digital terrestrial transmission is cheaper in the long run, the initial cost for all households in South Africa to change to digital would be very high. Every household would have to obtain a set-top box or a digital-enabled TV (Armstrong & Collins, 2004). However, the government’s department of communication is currently planning a national strategy to provide guidance to the Government for the migration to digital which it is expected to roll out in the next decade. Termination of analogue broadcasting has been tentatively planned for 2012 (SADIBA, 2002).

Furthermore, the driving force for TV viewers subscribing to digital TV is for SuperSport channels, not interactive TV (ICASA, 2004).

Lack of Technology Present in Households

In order for viewers to interact with their TV, they need a set top box. Set top boxes currently have little processing power, memory and are currently expensive. Many households currently do not have the means to purchase a satellite dish, never mind

paying a monthly subscription to DSTV. Furthermore, approximately 6 million South Africans do not have access to terrestrial radio and TV signals at all due to transmitter density (SADIBA, 2002).

Return Path Challenges

The return path refers to people transacting with their TV. There are many problems currently in Africa concerning this. Firstly, in order to transact, the user requires a telephone line and a dedicated modem. Without these hardware infrastructures, it is impossible to send a transmission from a TV set, which means that transactions are not possible (Letele, 2002).

Again, it is important to consider that many homes are not equipped with telephone lines. According to the 2001 Census, only 42.2% of South Africans had access to a telephone and this included land-lines and cellular telephones. This again, will hinder transactions from taking place.

Differences with Personal Computers

According to Perera (2002) i-TV is often trying to emulate the Internet. However, this is problematic as TVs have lower resolution than computers, they currently do not have hypertextual capabilities, scrolling across screens is not possible and input devices are very limited (Perera, 2002). Due to TVs having low resolutions, a TV screen can display less than one third of what a standard computer monitor can show (Perera, 2002).

Griffiths and Pemberton (2005) claim that when designing i-TV applications, one may require a different approach to desktop applications.

Additionally, TV watching in the past has always been “passive”, whilst work on a computer has traditionally always been “active”. TV viewers may feel adverse towards their TV becoming an active tool, when it was once a form of relaxation for them (Perera, 2002). Griffiths and Pemberton (2005) reiterate the notion that a viewer’s surroundings are geared towards relaxation. Furthermore, viewers often have the tendency to do different activities while watching TV. Also, TV is often watched in the company of others. This may further deter viewers from using T-Commerce (Griffiths and Pemberton, 2005).

Theoretical Framework: Unified Theory of Acceptance and Use of Technology

A number of technology adoption models were considered as framework for the study. These included the Technology Acceptance Model, the Theory of Planned Behaviour, their initial extensions and the Innovation Diffusion Model. In the end, the Unified Theory of Acceptance and Use of Technology (UTAUT) model was found to be the most relevant theoretical framework for our study. The UTAUT is an IT acceptance model integrating eight prominent models, including those mentioned above as well as the Theory of Reasoned Action; Motivational Model (MM); C-TAM-TPB; Model of PC Utilisation (MPCU); and the Social Cognitive Theory (SCT) (Anderson & Schwager). Of the seven high-level constructs in UTAUT, only four play a vital role in acting as direct determinants of user acceptance and usage behaviour: performance expectancy; effort expectancy; social influence and facilitating conditions. These four constructs

subsume the following more traditional acceptance sub-constructs (Venkatesh *et al*, 2003):

- Performance Expectancy is reinforced by Perceived Use, Extrinsic Motivation, Job-fit, Relative Advantage and Outcome Expectancy.
- Effort Expectancy includes Perceived Ease of Use, Complexity and Ease of Use.
- Social Influence contains Subjective Norms, Social Factors and Image.
- Facilitating Conditions look at Perceived Behavioural Control, Facilitating Conditions and Compatibility.

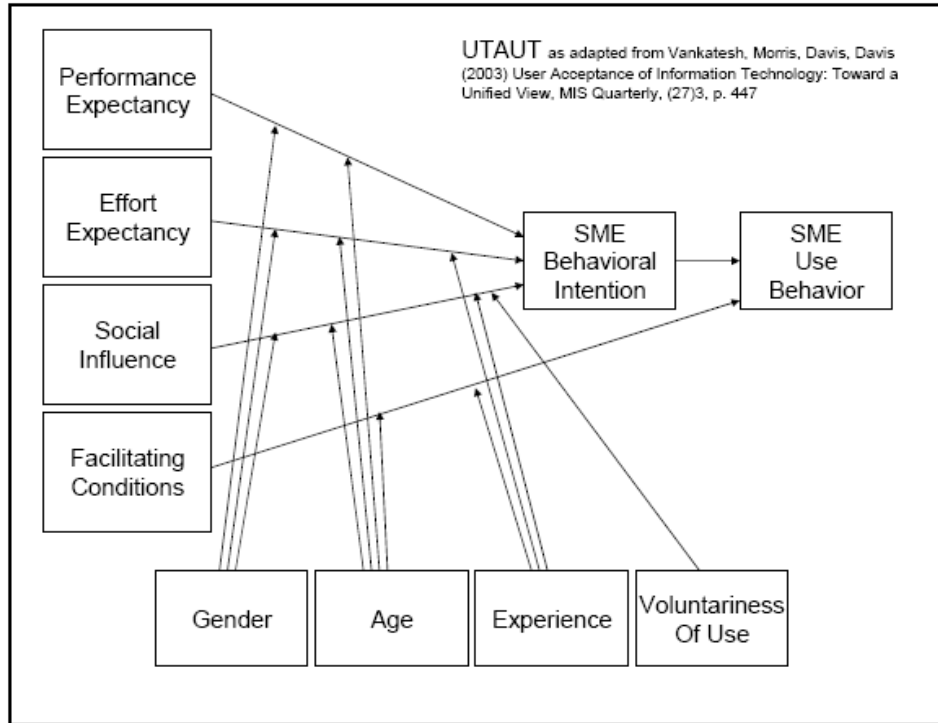


Figure 1: UTAUT Research Model (Source: Venkatesh et al, 2003)

Research Methodology

Due to the explorative nature of the research but also the small number of South African T-Commerce users, a qualitative data approach was used. The data gathering instruments used in the research were interviews and questionnaires.

Semi-structured interviews were conducted using a set of open-ended questions that would allow for unrestricted responses from various participants (Wysock, 2000). Two sets of interviews were conducted. The first set was aimed at the general public (hereafter referred to as the user) to assess their knowledge of T-Commerce and whether they would potentially adopt the technology in the near future. The second set of questions was aimed at the professionals in the field, consultants, and Multichoice and SABC personnel, (hereafter referred to as providers) involved in interactive TV. The aim here was to assess how viable T-Commerce would be in South Africa, why there has yet to be a large adoption of the technology and what infrastructural changes should occur in order for the technology to be accepted.

The semi-structured interview questions were derived from the research propositions and were adapted after the pilot interviews. A questionnaire was also completed by the participants. The questions were built-on from a prior study on the awareness and adoption of T-Commerce in South Africa (Brown *et al*, 2003). The sampling method was a combination of snowball sampling and convenience sampling. Participants from the user segment were randomly chosen. The goal was to gain a diverse sample in order to diversify the demographic groups. This was very important to the study, as it was able to give the study an insight into whether demographic conditions are a major factor in the public's perception and awareness of T-Commerce. In the end nine users were interviewed. Participants from targeted industries such as hotels and banks were approached to participate in the study. The intention was to get an overview of why there is currently a lack of adoption and awareness of t-commerce in the country and the measures that could be taken to increase awareness and promotion of the technology. Five providers consented to participate in the study.

One limitation of the research is that respondents were all based in Cape Town and findings may therefore not be representative of South Africa as a whole. Also, several attempts were made to conduct interviews with Multichoice but met no success. It was also difficult to find providers that were involved in any form of interactive TV thus our sample with this regard was very limited.

Data Analysis and Findings

PERFORMANCE EXPECTANCY

Relative Advantage: Speed

Most interviewees regarded speed as a factor they would consider when deciding whether or not to adopt the new technology. There was a common perception that T-Commerce would have to be faster or at least operate at the same speed as E-Commerce for it to be adopted. However, speed was not seen as the most important factor to consider when deciding whether or not to adopt the technology. An interesting thought that cropped up was that there is generally a 'limit' to speed and once a technology reaches a certain speed, the importance of speed as a factor slowly diminishes. "It gets to a point where ... if it's faster it doesn't really make a big difference..." (*User 8*). Some interviewees felt that speed would not be a major factor for them and would still consider migrating even if the speed of T-Commerce was slower relative to E-Commerce.

The providers, however, had different views. There was a perception that current speeds are very slow and need to be more efficient. T-Commerce can only be used effectively if speeds are faster. There was also mention of satellite downloading speeds being decent while the upload speeds are still inferior.

Relative Advantage: Security

Security issues came about as one of the bigger concerns, as is the general trend with all new technologies introduced. There was a general perception among prospective users of the technology that T-Commerce was generally less secure than E-Commerce due to the latter's greater maturity. This concern came about due to the lack of awareness and knowledge about the technology. It was ascertained that users would take time to gain

confidence and trust in the use of the technology. By contrast, a number of interviewees that currently engage in E-Commerce felt that security was not necessarily a defining factor in their non-adoption of T-Commerce. They opined that it may be too much of an effort to change mediums when they already have confidence in and are comfortable with another medium.

Providers of the technology cited the importance of security measures especially for business purposes. However they had no concerns about security and expected it to be secure due to improved security measures and encryption techniques available today.

Relative Advantage: Cost

Different perspectives emerged over the cost involved with using the new technology during the interview process. A significant proportion of the interviewees viewed cost as a major factor affecting their adoption of the technology and would only consider migrating to the new technology if it were to become cheaper than current technologies, such as E-Commerce. It became apparent that there was a common perception that it would be cheaper to engage in E-Commerce than T-Commerce. The reasons identified were the high cost of DSTV subscriptions and input devices needed for T-Commerce such as keyboards and newer more interactive TVs. The cost of these input devices seemed to be a major issue and seemed to be one of the primary inhibitors. M-Commerce, on the other hand, was thought to be growing at a faster rate than T-Commerce due to the easy and cheaper accessibility of mobile phones.

Interestingly, a few users thought that the cost of the technology would not be a major issue and would still consider migrating to T-Commerce even if the costs incurred were larger than E-Commerce. However it was also noted that cost as a factor was not evaluated on its own, but was instead weighed up against other factors such as convenience to conduct commerce from the comfort of ones home and service quality.

Perceived Use

Most interviewees viewed T-Commerce as a substitute for E-Commerce and would therefore rather remain using E-Commerce because they were much more comfortable and familiar with it. They felt they would not gain any extra benefits in migrating to T-Commerce. People also confused infomercials as being the sole object of T-Commerce. There was a fear among interviewees that T-Commerce may be too limited in terms of functions and usability and it may not be very user friendly because it is imposed on the user. Users do not have as much control when using the TV medium as they would have when using a computer to engage in commerce.

There was however a general trend among interviewees that T-Commerce would be more convenient for the general public as a whole due to greater accessibility of TV than computers.

EFFORT EXPECTANCY

Complexity

Interviewees that attempted to use interactive TV found that there was a lack of technical support available. One respondent explained how he tried to set up TV-mail, however found no call centre number for the problem at hand and had to make several fruitless

phone calls in order to find someone who could help him. The configuration of settings and the actual use of interactive TV is perceived as being very frustrating and users often gave up after considerable effort. Interviewees mentioned that interactive TV would have to be seamless in order for people to adopt it. Furthermore, it was difficult to obtain user-friendly input devices such as keyboards because most outlets had discontinued stocking them.

Perceived Ease of Use

A frequent theme identified was that users felt that using the remote control as an input device may be limiting, due to it lacking alphanumeric input keys such as on a mobile phone. In order for it to be easier to use, a keyboard and a pointing device such as a mouse may be “useful”.

Furthermore, users found functionality and usability for shopping on T-Commerce very limiting. When comparing products using the computer and the TV, the computer is far superior in that you have more control over your actions, while the TV restricts the user to the limited options available as it is menu driven. Currently the Internet also has a wider selection of products to choose from.

Another interesting notion identified was that frequent users of E-commerce and the Internet felt that they had become more familiar and comfortable and therefore saw no need to migrate to any other form of commerce. “as a worst case scenario there’s an Internet café, there aren’t TV cafés yet...” (*User 5*).

Interviewees that had used the interactive channels currently available on DSTV felt that the channels such as “News” and “Weather” were very useful. However, they also felt that the interactive channels lacked *content* on each screen which they felt was due to low resolution TV screens. “T-Commerce is lacking content, for example Carte Blanche [you] cannot go back and browse a story from last week but with T-Commerce[you] can perhaps go back to browse it” (*User 6*).

Overall, it became apparent during the study that “Ease of Use” was a very subjective and individual experience. Computer literate people who used computers and technology frequently felt that it would not be as difficult for them to adapt as compared to people who did not utilise technology frequently.

Trialability

In order to increase awareness of interactive TV, it would be necessary to offer the service on a trial basis. A common notion identified amongst the providers was that users are deterred by the additional factors associated with this technology and the lack of understanding of its possible perceived benefits. They see that a trial period would increase awareness and help to increase the necessary support structures.

Respondents had often never used interactive TV and were not aware of it so they had little or no perceptions about it. They did however say that if they could get a chance to use it, they would perhaps utilise the opportunity. They felt that a trial period may be necessary in order to encourage and educate them about this new technology.

SOCIAL INFLUENCE

Image (TV vs. Computer)

Interviewees feel they are more comfortable using E-Commerce because it is more familiar to them, therefore do not perceive any benefits from migrating to T-Commerce. Familiarity was gained because interviewees' jobs often entailed the use of the Internet. Many respondents mentioned that download speeds, security, cost and ease of use would generally have to be superior to E-Commerce in order for them to migrate to T-Commerce.

Interviewees also explained that TV watching had been perceived as "passive" entertainment whereas in comparison, computers are used for "active work". They also mentioned that this will deter people from using T-Commerce because they do not want to work on a medium that was previously perceived as "relaxing entertainment". They further explained that the concept of interacting with your TV was perceived as peculiar because it has not been done in the past. However, others were intrigued by the fact that one could conduct commerce from the "comfort of your lounge" (*User 1*).

Furthermore, interviewees explained that TVs are often placed in communal areas of a household. TV watching is often done in the presence of others whereas work on computers is mainly done in a more personal and private environment. Interviewees said they did not feel comfortable conducting commerce (such as banking) in the presence of others. "...PC is a personal computer, that's my computer, I have a password to get into it. The TV everyone uses, the kids use it [and] they like watching Harry Potter or whatever. My parents are squeezing [around it]. [It] sort of crashes 300 times an evening and then I'm supposed to be doing reliable T-Commerce there..." (*User 5*).

Innovativeness

Respondents said that T-Commerce would have to be easy to use in order for them to use it. They perceived little benefit from migrating from E-Commerce to T-Commerce because they said that they already had means of doing commerce via the Internet and did not think that they required an additional medium to conduct commerce. However there were those intrigued by the concept of shopping over a TV set; intrigued enough to want to use it and figure out how it works on their own.

Awareness

The most prominent factor contributing towards the non-adoption of T-Commerce in South Africa was found to be the lack of awareness among citizens. A prominent and recurring theme, even among the pre-selected interviewees, was the lack of prior knowledge that this technology existed, never mind having come across the terms T-Commerce and i-TV. Interviewees that claimed they were aware of the term T-Commerce were often under the impression that it was a synonym for infomercials and therefore had a distorted or incorrect perception of T-Commerce. Once respondents become aware T-Commerce through the process of the interview, they claimed that they would be more interested in experimenting with the technology. They did however appear to be wary about disclosing sensitive information required for financial transactions such as product purchases and banking details.

Interviewees assumed that their reasons for non-awareness of T-Commerce were due to lack of marketing and advertising campaigns by digital service providers. Additionally, corporate companies seemed to have no vested interest in providing products via a T-Commerce channel, as there was no market that would justify the costs associated with

the implementation of a T-Commerce channel, nor would marketing via a T-Commerce channel widen their current customer base.

Respondents, providers and users alike, felt that South Africans are resistant to change, especially concerning the adoption of new technologies. The uptake and growth of Internet usage among South Africans was slow compared to Internet growth in other countries. Therefore, general consensus led to a belief that T-Commerce adoption would be slow.

Potential users mentioned that if the general trend was moving towards the usage of T-Commerce, they would adopt T-Commerce too. One respondent claimed: "I think South Africans are generally sheep, they generally copy the leader" (*Provider 5*).

FACILITATING CONDITIONS: INFRASTRUCTURAL NEEDS

What materialised from a majority of the interviews after further analysis was that there is consistent concern that newer and improved TV sets are needed to encourage the full potential of T-Commerce. However respondents also mentioned that not all households that appeal to the T-Commerce target market will be able to obtain these new TV sets as the technology is priced as a luxury items and not a necessity.

Along with this new hardware, users identified that there will be a need for a download and upload facility, which can be done via Digital Satellite (DSTV) , ADSL, broadband, ISDN link, wireless networks such as 3G or even a simple dial up connection. Another factor that became apparent is that people are generally resistant to change, however small the change may be.

It was also noted that regulated Internet connectivity is a deterrent. It was mentioned that South Africa in particular is hindered considerably by the regulations in telecommunications which are impairing the uptake rate of the Internet.

The respondents felt that the availability of broadband was a double edged sword, as both the non-availability and the availability of it could inhibit the growth of T-Commerce.

This was seen in the context of expected wider bandwidth and greater connection speeds with broadband at cheaper rates (Telkom) for Internet downloads. On the other hand though, if ADSL is not available then the performance speed of T-Commerce will be somewhat restrictive and slowly fade away. However there are some that do not see connectivity growing quickly enough. "it is unlikely that connectivity will increase fast enough to have an effect, it's been [here] the last three years hardly any growth in connectivity its changed from dial up to higher speed broadband connections but no increase in real number of users" (*Provider 2*).

MODERATORS

Although the sample was very small, three moderating factors were clearly found to influence peoples perceptions of the major determinants mentioned above: access level, income and age. A larger, more representative study could explore the validity of these moderating factors.

Access levels refer to a person's accessibility to a computer, the Internet and the type of Internet connection they have and also the TV channels available to them (DSTV, MNet or SABC). It was found that depending on what people had access to, their perceptions

regarding T-Commerce differed. These differing reasons ranged from convenience to performance to experience. The differences were mainly due to the cost factor associated with these reasons.

Income is directly associated with people's disposable income which is used to purchase these technologies. Depending on the person's income the reasons for convenience, performance and experience varied.

Finally, the age of the person appeared to moderate the major determinants significantly. Younger respondents (between the age groups of 20-30) were found to have positive perceptions about adopting new technologies and showed more interest and inquisitiveness about T-Commerce, even if they were not aware of what T-Commerce was. On the other hand, older respondents (older than 30 years of age) showed little interest in adopting new technologies.

Discussion and Implications

It became evident during the data analysis that there were various inter-related factors which are causing the non-adoption. These factors will now be each examined in turn to discuss their implications for theory and practice.

COST

Cost was found to play a factor in the decision of whether or not people would be willing to adopt the technology. As such, it can be directly influenced by service providers and banks should they wish to increase or decrease subscription and transaction rates. If there is a perception that the cost of the service is too high and could lead to a decrease in the benefits associated with the technology, thus other methods of commerce such as E-Commerce and M-Commerce will become more attractive. In order to increase adoption of the technology, it is essential for banks and service providers to compete with the current cost implications associated with other commerce mediums. This is due to the fact that cost, as a driving factor of the adoption of this technology, is often weighed up against the perceived added benefits that the service can offer over other existing mediums.

LACK OF SECURITY

Security was found to be one of the factors directly related to the decision to adopt the technology for commercial services. This finding is consistent with the existing literature where it was found by Barnard & Wesson (2003) that factors such as lack of technologies or the 'perceived' lack of technologies to support a secure transaction can hinder the adoption of E-Commerce. This would equally hold true for T-Commerce as there is a clear link between the adoptions of both technologies.

This implies that if the technology is to be adopted, then it must be perceived to be safer and more secure than current mediums. In order for users to become more amendable about the technology, greater emphasis needs to be placed by banks and service providers on security measures.

LACK OF SPEED

Speed came about as a factor that was considered when deciding whether or not to adopt the new technology. The direct association between speed and adoption implies that service providers should make greater efforts to ensure that transactions are of an acceptable speed. The importance of broadband is a factor as it will come down to the individual's usage of the facility for their own purposes, be it on the computer or with the TV, remembering that the need for increased speed only goes as far as the users can afford it.

COMPLEXITY/PERCEIVED EASE OF USE

The perceived complexity of the technology was found to be a deterrent and thus played a factor in the non-adoption of T-Commerce. This is consistent with the existing literature and again ties in with the Technology Acceptance Model (TAM) which illustrates that people's perceptions about the usefulness of a technology is dependent on the degree to which they perceive the complexity of that particular technology. The direct association between perceived ease of use and non-adoption has key implications in the field. It is important for manufacturers to provide user friendly input devices and providers should have sufficient support structures in place such as call centres.

LACK OF PERCEIVED USEFULNESS

Perceived usefulness was found to be a factor directly related to the decision to adopt the new technology. Participants generally did not see the need to migrate to T-Commerce because they felt there would be no additional benefits to be gained from the use of T-Commerce. This is consistent with the existing literature on the Technology Acceptance Model.

The implications from this are that in order for the technology to be adopted, it must be perceived to be more useful and beneficial than currently existing mediums. In other words, the benefits associated with the technology must be seen to outweigh those of its rival technologies. In order for providers to accelerate the adoption process of the technology, there needs to be an emphasis on the convenience and benefits the use of the technology can offer, as well as ensuring that the technology does indeed offer real and significant value over existing alternatives.

RESISTANCE TO CHANGE

Resistance to change was identified as a trait that was relative to the user. This is consistent with The Innovations Diffusion Theory (IDT) which identifies several different categories of people as technology adopters (Clarke, 1999). This implies that providers should focus their efforts on targeting users that have a higher potential to adopt this technology. It became apparent during the data analysis that senior citizens were much more resistant to change and thus providers should be focusing their advertising and marketing campaigns on the youth, who have been found to have a higher propensity and willingness to adopt this technology.

In order to decrease people's resistance to change, it would be viable to provide the technology on a trial basis. This concept is also consistent with the literature, particularly the IDT which emphasizes the importance of trialability (Saljoughi, 2002). This means that providers should be spending more effort in allowing prospective users to evaluate

the technology on a trial basis. Even after this trial period the technology will need to be affordable or the majority of the middle income earners will lose interest.

LACK OF INFRASTRUCTURE

Lack of infrastructure or the lack of accessibility to adequate infrastructure was seen as a factor that would limit the adoption of the technology. The literature supports this view where the cost of the necessary infrastructure was seen as a major problem for households (Armstrong & Collins, 2004). The performance of T-Commerce is dependant on what technology is available to the household, as there is a significant difference between a dial up connection and an ADSL line.

The lack of digital technology was seen as a factor that is hampering the growth of T-Commerce in South Africa. Together with the many challenges facing return paths, it would not be possible to engage in T-Commerce without adequate infrastructure in place. This implies that greater effort is needed by broadcasters to speed up the transition from analogue to digital. Hardware infrastructure will also need to be provided at cheaper prices and infrastructure providers would need to provide their service at more affordable rates, which was also heavily emphasised by interviewees. The regulation of the telecommunications industry in South Africa is another factor that is slowing down the adoption of the technology. Providers generally agreed with these views.

LACK OF AWARENESS

The identification of the lack of awareness as a central factor in the non-adoption of the technology implies that service providers, banks and all relevant stakeholders should increase the effort in increasing awareness and exposure of the technology to accelerate the rate of adoption. This can be done through increased marketing and advertising campaigns. A majority of interviewees were unaware of the existence of the technology. In this regard, there needs to be greater effort from the part of providers in increasing exposure of the technology.

NEGATIVE IMAGE

The difference between using a computer and a TV set as a transaction medium was seen to play a role in the non-adoption of the technology. This finding is further aligned with the literature where it was said that i-TV has a lower screen resolution, no hyper-textual capabilities, and it is not possible to scroll horizontally. Providers may need to attempt to change the user's mindset before trying to get them to engage in commerce through the medium.

Conclusion

This study explored the reasons for the non-adoption of T-Commerce and the factors that lead up to the non-adoption. The UTAUT model (Venkatesh et al, 2003) was used as the framework to identify possible key adoption factors. The combined use of an inductive and deductive approach allowed for greater value in the data gathered from the interviewees.

The most prominent determinant was found to be the lack of awareness among potential T-Commerce adopters. If T-Commerce were to be adopted in South Africa, service

providers would need to advertise and market it better in order to create greater awareness.

A further prominent determinant was found to be that only a small niche segment of the market had access to T-Commerce, due to citizens having to pay an excessive subscription fee to have access to the service. This specific market generally had access to computers and therefore did not foresee any further benefits from using T-Commerce when they already utilised E-Commerce. Currently E-Commerce offers more perceived advantages such as being cheaper and more cost effective, more secure and faster than T-Commerce. Therefore, T-Commerce will not experience high adoption rates if it is not made more attractive to a larger market.

The modified model was adapted to account for various moderators. There is an indication that age, income level and access level influenced the adoption factors but future research should validate these with more representative sample.

Limitations and Future Research

The small sample size prevented the research team from completing a thorough study that takes into account a more holistic view of the target market. Therefore, recommendations for any further research done on this topic would include extending the study to a national level, in order to eliminate the limitations imposed in this study. This would also result in a larger population sample and a more holistic view of T-Commerce being taken into account

Further research could focus on behavioural patterns as to *how* people formulate their perceptions and adoption decisions with regards to new technologies. If people's perceptions were tracked over a period of time, it would be easier to further ascertain their process of adoption/non-adoption and factors that influence their perception. These factors would be ideal, if they were focused solely on the South African environment.

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