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A Review of Mobile Commerce Applications for Small Medium Enterprises in South Africa

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Abstract: Rapid developments in mobile communication technologies especially in developing countries have raised hopes for fast take off in mobile commerce (m-Commerce). However, consumers demonstrate lack of enthusiasm, possibly due to lack of trust. Modern markets have seen transactions are being electronic transactions conducted using a mobile terminal and a wireless network using portable devices such as mobile telephones and smartphones as well as devices mounted in the vehicles that are capable of accessing wireless networks and perform mobile commerce transactions. This study is going to review the use of mobile commerce advances in South Africa. This study is therefore assumes that mobile commerce contributes to significant progress towards modernizing and providing new ways of offering services to customers. The review acknowledges that the use of mobile communication technologies, particularly mobile phones among micro enterprises in South Africa is quite high. More often than not mobile phones are used by Small Medium Enterprises (SMEs) to communicate with both suppliers and customers. The review is also of the understanding that limited awareness of product functionalities, capabilities and affordability may be contributing factors businesses not using mobile commerce applications. The implication of this review study is that it potentially explains significant difference between m-Commerce marketing and traditional marketing by exploring the opportunities and challenges brought by the modern m-Commerce practices.

Key words: Mobile commerce, wireless networks, mobile phones, small medium enterprises, mobile marketing, opportunities

INTRODUCTION

Based on the optimistic value that mobile commerce (m-Commerce) adaptations stimulate business growth and development of new markets (Balasubramanian *et al*., 2002), business enterprises over the past years have enthusiastically prognosticated about a seamless, mobile world where commerce occurs on an anywhere, anytime basis. Independent to the question whether m-Commerce can really fulfil the hopes and expectations connected with it, effective market analysis should systematically explore the opportunities and challenges posed by m-Commerce in a rural marketing place (Donner and Escobari, 2010; Ongori and Migiro, 2010; Qureshi *et al*., 2010). For instance, understanding the complexity of mobile commerce and accept that it involves a number of participating entities such as mobile network operators, device manufacturers, service providers, content providers, application developers, trading companies as well as customers.

With focus on rural marketing places in South Africa, questions arise to why a significant number Small Medium Enterprises (SMEs) fail to develop and sustain their businesses owing to the lack of resources. At the same time, there is strong evidence that even the basic Information and Communication Technologies (ICTs) in general and mobile devices in particular improve business success. However, whether or not these technologies are used and the extent of the usage remains largely unknown. Furthermore, details of the specific strategies related to mobile device usage by micro entrepreneurs are also unknown. More empirical research is needed to understand and explain this lack and all the hidden irregularities.

Of course such research has to take into account theoretical concepts and empirical findings of previous studies on determinants of usage of mobile devices by a number of companies in South Africa. Therefore, main purpose of this study will be a review of previous results related to m-Commerce usage and adaptations in a

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South African context. Empirical findings by previous researchers concerning determinants and usage of m-Commerce applications and how m-Commerce create new business will be reviewed in this study. More so, the determinants, success factors and eroding barriers pertaining to m-Commerce adaptations will also be reviewed in this study. Some final remarks, relating to more general topics within m-Commerce research will conclude the study.

MOBILE COMMERCE IN SOUTH AFRICA

A number of m-Commerce systems are found within South Africa, such that the concept of commerce is being adopted by various business and service providers. It was predicted that the adaptation of mobile technology would play an increasing role in South African business (Jobodwana, 2009). M-Commerce does not offer a convenient way of offering services but also extends to the company's workforces to enable self-services, for example, MTN a mobile company in South Africa is "committed to becoming a leader in cellular and data services in South Africa and the rest of Africa" (Brown *et al*., 2003). In the banking sector, we have seen South Africa's big companies like Standard Bank, First National Bank, ABSA and others implementing m-Commerce systems that allow banking via the mobile environment (Brown *et al*., 2003). They are using applications such as mobile banking and cell phone banking facilitating banking anywhere anytime.

In the sporting field, mobile system has been developed in such a way that fans and supporters of different sporting disciplines are provided with information pertaining to the sporting disciplines they support (Deen-Swarray *et al*., 2013). It is now easy to get cricket scores for example for the match between maybe South Africa Proteas and India taking place in India. This facilitates regular checking of such scores without churning on to a television station to watch the match. In terms of entertainment we have seen a lot of personalization, cell phone owners making their phone looking familiar and having ringing the tones they like. Companies like Exact mobile and MTN South Africa also make business profit by selling mobile logos and screen savers and games, etc. (Brown *et al*., 2003).

South African businesses has also seen adopting m-Commerce applications in performing competitions in the market, thus, Short Message Services "SMS and Win" (Brown *et al*., 2003). A statement found with ease in many products sold all over the country and such practices and applications had facilitated marketing communication for organizations. People or companies hosting such competitions urge people to send text messages or Short Message Services (SMSs) containing maybe a barcode of products they just bought and claiming that the customer would stand a chance to win great prizes from maybe a grand draw in future. With all these examples, it must be clearly said that the idea of m-Commerce is really being adopted in South Africa and its use is rising enormously. Companies are now using mobile systems to render services both in urban and rural markets (Qureshi *et al*., 2010). Such move to mobile system could be due to "anywhere" and "anytime" feature of mobile commerce which allows for greater convenience.

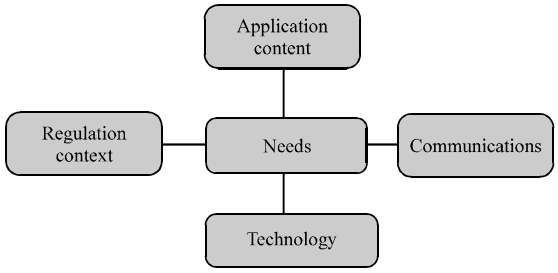

Fig. 1: Mobile business framewor modified from Camponovo and Pigneur (2003)

Business model analysis applied to mobile business: Camponovo and Pigneur (2003) understand business models as consisting of four main elements that illustrate the value proposition, the customer relationship, the infrastructure and the financial aspects. Many reserchers share a similar set of mobile business market key actors which they classify according to three general main classes: technology, application and network as shown in Fig. 1.

Camponovo and Pigneur (2003) propose to classify the players according to the framework illustrated in Fig. 1. At the center of the mobile business world is the user, who has mobility related needs. In order to fulfill these needs, we need three necessary and complementary supporting blocks which are communication (including the different networks that provide transmission capabilities), technology (composed by all the required hardware including network equipment, mobile devices and platforms) and the services (including applications, content and supporting services). These blocks are then constrained by regulation and social context.

Enterprises must also take characteristics such as mobility, network effects and proprietary assets into consideration when they develop their business models. From these characteristics, it follows that the provisioning of complete mobile services solutions requires the collaboration of a large number of market players,

especially including network operators and device manufacturers. Mobility adds complexity to application and services development which require broader competencies.

Network effects require that the different networks, devices and applications are inter-compatible, requiring partnerships to forge common standards. Finally, the existence of exclusively controlled indispensable assets and natural monopolies requires firms to partner with network operators, unless financial problems or regulations impose them to open access to the assets they control. In fact, until now, no player managed to succeed in providing an end to end solution between the content owner and the end user on its own. Partnership management is thus, likely to become a core activity of a large number of mobile business enterprises (Camponovo and Pigneur, 2003).

Embedding m-Commerce into corporate marketing strategy: From Camponovo and Pigneur (2003) suppositions the need for mobility seems to be a primary driving force behind mobile commerce applications such as mobile banking, mobile entertainment and mobile marketing. A major role is thereby played by the ever-increasing convergence of computers and mobile telecommunication devices for example cell phones, tablets and smart phones. It must be noted that m-Commerce combines internet functionality with the location independence of cellular technology (Mort and Drennan, 2002). Therefore, implementation of m-Commerce requires the integration of multiple parties.

Cellular operators and device manufacturers provide the infrastructure, content and service providers supply the applications and service providers support the technical implementation, for example, partnership of Samsung with a network provider such as Vodacom (Brown *et al*., 2003). Managers should therefore make sure that m-Commerce must be an integral part of the corporate strategy and m-Commerce must be embedded in marketing strategy. Sometimes user acceptance shows the general interest in new technologies among the target group but also it shows the need for accompanying marketing activities more so the goal of the mobile channel will be to trigger a spontaneous reaction in the customer (Donner and Escobari, 2010). While marketing activities attract the general population into the market.

Mobile technology usage by small medium enterprises: There is increasing empirical evidence that the usage of mobile technology by SMEs will possibly aid in SMEs to gain competitive advantage and enhance their chances of survival in the market (Wolcott *et al*., 2008) . It is believed that the use of mobile technology in small businesses will possibly improve communications (between suppliers and customers), reduce the cost of operation (day-to-day travelling, cost of buying stock and meeting customers) and improve access to information and knowledge (being informed about prices regarding the business) (Donner and Escobari, 2010; Friberg *et al*., 2001).

Table 1: Effect of ICT use on firm performance in developing countries

Enterprises	Not using ICTs	Using ICTs	Difference
Sales growth (%)	0.400	3.800	+750
Employment growth (%)	4.500	5.600	+24
Profitability (%)	4.200	9.300	+113
Labour productivity	5.288	8.712	+65

Matlala *et al.* (2014)

With the above-mentioned success factors, a number of frameworks used in prior studies has formed a number of variables that seem to affect the acceptance of mobile technologies by SMEs. Models such as the Technology Acceptance Model (TAM) that was postulated by Davis (1986) can be used to understand technology acceptance among customers. The TAM proposes that the usage of an information system is influenced by the behavioural intent.

However, on the other side, the behavioural intent is also influenced by the individual's attitude towards the acceptance of the system and also by the person's perception of its utility (Camponovo and Pigneur, 2003). Davis as cited by Camponovo and Pigneur (2003), states that the person's attitude is not the only determinant of a particular system but is also well centred on the influence which it may have on the person's performance. Therefore, the customers' acceptance towards mobile technologies adaptations by SMEs will be determined by the perceived usefulness and perceived ease of use of mobile technologies in rural marketing places.

Castells *et al.* (2009)further asserts that economic productivity is increasingly tied to access to technology and knowledge. Through business transformation, mobile technology usage may enable SMEs to accomplish the aims and objectives of the business (Wan, 2009). Research has shown that when SMEs adopt mobile commerce they can grow by 3.4% (Table 1) and that the innovative uses of mobile technologies can provide new opportunities for SMEs (Castells *et al*., 2009). It is envisaged that mobile commerce enable informal businesses to save money and travel time, compare prices, transact with existing customers and increase their customer network (Donner, 2008). Table 1 illustrates how the usage of mobile technologies can possibly enhance the growth and profitability of the business.

Several studies have identified mobile commerce as one of the key tools that increases the chances of the success of businesses (Deen-Swarray *et al*., 2013;

Table 2: Types of technologies

Types of technologies	Purposes
Computers/Laptops	Preparing business and personal documents such as business plans, keeping records of the business, recoding business transactions
Mobile phones	Communicating with suppliers, customers, family and friends
Photocopiers	Used to make copies of the price list and other related business information that needs to be circulated to customers and suppliers
iPads, tablets and tabs	Communicating with suppliers, customers, galaxy family and friends
Fax machines	Communicating with suppliers and customers in terms of using hard copies
Televisions and radios	Being informed about the prices and special deals regarding the business

Matlala *et al.* (2014)

Donner, 2008; Qureshi *et al*., 2010). The use of mobile devices allows SMEs to communicate more efficiently with suppliers, customers and business associates, thus improving their competitive advantage in the industry, facilitating market research and improving information access (Inmyxai and Takahashi, 2012). Consequently, it is believed that mobile commerce plays a significant role in promoting economic development and enhancing SMEs business activities. In many developing economies, mobile commerce has become the focus as a means of reducing poverty, promoting businesses and encouraging competitiveness in the global economy.

Types of technologies: The use of mobile technologies by SMEs is often limited to less complex technologies such as personal computers, laptops, telephones, mobile phones, fax machines, photocopiers, televisions and radios (Table 2). This limitation is caused by the restricted financial resources accessible to their nature of business (Donner, 2008; Esselaar, 2007). With the initiation of personal computers, broadband Internet and mobile devices such as mobile phones, smartphones, tablets and iPads, ICTs have become an important driver in fostering innovation, leading to enhanced firm productivity and economic growth (Matlala *et al*., 2014).

MOBILE APPLICATIONS AND PAYMENT METHODS IN M-COMMERCE

Since, there are potentially an unlimited number of mobile commerce applications, SMEs should strive and attempt to identify several important classes of applications. It is also important for SMEs management to discuss how to successfully define, architect and implement the necessary hardware/software infrastructure in support of mobile commerce. Also, to make mobile commerce applications a reality, management should address networking requirements, discuss support from wireless carriers and present some open research problems. However, individual mobile services of similar nature can be bundled into an application, e.g., mobile ticketing or mobile banking. In Table 3, we present a brief overview of diverse m-Commerce application.

Table 3: M-Commerce services and applications

Applications	Examples of offered services
Mobile banking	Mobile accounting
	Mobile brokerage
	Mobile financial information
Mobile entertainment	Mobile gaming
	Download of music and ring tones
	Download of videos and digital images
	Location-based entertainment services
Mobile information services	Current affairs (financial, sport and other news)
	Travel information
	Tracking services (persons and objects)
	Mobile search engines and directories
	Mobile office
Mobile marketing	Mobile couponing
	Direct (context-sensitive) marketing
	Organization of Mobile Events
	Mobile newsletters
Mobile shopping	Mobile purchasing of goods and services
Mobile ticketing	Public transport
	Sport-and cultural events
	Air- und rail-traffic
Telematics services	Remote diagnosis and maintenance of vehicles
	Navigation services
	Vehicle tracking and theft protection

Modified from: Tiwari *et al.* (2006)

Advances in e-Commerce have resulted in significant progress towards strategies, requirements and development of e-Commerce applications (Tiwari *et al*., 2006). However, nearly all e-Commerce applications envisioned and developed so far assume fixed or stationary users with wired infrastructure. There are many new m-Commerce applications that will be possible and significantly benefit from emerging wireless and mobile networks (Mort and Drennan, 2002). Various mobile applications come with diverse services which management of any SME which is willing to adopt m-Commerce practices should consider.

Criteria affecting commerce with mobile access among SMEs: In the mobile internet environment, people can use a mobile application with a wireless connection anywhere and at any time. Mobility of devices and applications raises the issue of the appropriateness of their use under certain circumstances that is; mobility is a strategic consideration for m-Commerce among SMEs to utilize in aiming for success. Therefore, the mobile commerce success factors can find and extract the major aspects of technological adoptions among SMEs (Molla and Licker, 2005). The major m-Commerce success factors which are common to SMEs as postulated by Molla and Licker (2005) are: system quality, content quality, use, trust, support, mobility and personalization.

System quality: the principal criterion for judging whether site performance is sufficiently smooth and seamless in m-Commerce.

Content quality and commerce needs: content quality includes the attributes of the content that are presented directly on mobile devices. Information system's literature has emphasized the importance of information quality as one of the determinants of user satisfaction and has identified a number of attributes such as up-to-datedness; understand ability, timeliness and preciseness (DeLone and McLean, 2004).

Use and communication needs: The extent to which a system is used is one of the measures that are widely used to define the success of a business. Communication with others may be for business purposes or for personal purposes, i.e. with other consumers or personal networks and may be carried out within an information, entertainment or commerce context, for example, voice, text (e-Mail, SMS), video and data transfer.

Support and information needs: Support is a customer-oriented criterion and includes the following components: tracking order status, account maintenance, payment alternatives, Frequently Asked Question (FAQ) (Low *et al*., 2011).

Mobility and connectivity: The customer and business can employ mobile services and transactions from anywhere. At any time, m-Commerce must support this customer mobility. Mobility of device and application raises the issue of their suitability for the user under some circumstances (Tarasewich, 2003). Connectivity refers to having access to wireless networks including voice and Internet communications anytime and anywhere through various mobile devices. True connectivity is achieved through having access to ubiquitous mobile services. Therefore, connectivity is the underlying requirement for mobile commerce and its applications.

Personalization and entertainment needs: Personalization is defined as the customization of products and services to the context of the user (Andreou *et al*., 2005). However, since mobile devices have particular limitations, e.g., low battery capacity and small memory and screen size, personalization is needed to increase their usability. In general, users want to turn to their mobile devices when they have a few minutes to kill and get useful and practical entertainment solutions such as access to games or leisurely information. However in some contexts (subject to culture and availability of entertainment alternatives) mobile devices may act as a primary source of entertainment.

Eroding barriers: The following are major barriers to m-Commerce which SMEs are facing in the dynamic marketplace which they are operating under.

Security fears: Consumer fears regarding the safety of the information exchanged over a wireless network increases with the degree of interaction and the sensitivity of the information exchanged. Applications that require less interaction and are less personal (e.g., weather notifications) present a lower security concern than those applications involving increased interaction and containing personal information (e.g., mobile banking). Therefore, appropriate security features need to be implemented for each type of mobile application (Martin *et al*., 2012).

Reliability and download times: The total cost for unreliable connections could be high as it would encompass business losses and legal charges including fees and fines. Mobile users should not be forced to spend excessive amounts of time to access desired content (Okazaki and Mendez, 2013). Internet users have been accustomed to wired Web transfer rates of 55.6 kb/sec through dial-up connections as well as an increasing customer base for high-speed connections of up to 300 kb/sec. These speeds serve the purpose of accessing rich content in a reasonable amount of time (i.e., up to 10 sec) (Martin *et al*., 2012).

Lack of consumer interest and lack of standards across devices: Although, the mobile web situation has improved somewhat with the growing standardization on Web kit based browsers by smartphone and tablet manufacturers, it is unlikely that there will ever be a global standard for hardware or operating system (Okazaki and Mendez, 2013). Yet, fragmentation at the device level will pale in comparison to the imminent fragmentation in software channels as major hardware and software platforms all rush to erect walled gardens and proprietary marketplaces, each restricted to an arbitrary combination of devices, operating systems, carriers, geographic areas, retailers and social networks.

Cost and resources: The new prominence of the mobile internet means that few businesses can afford to ignore it and this is borne out by research showing that 70% of

enterprises plan to increase their mobile budgets in 2011 with over a quarter planning to double or triple their expenditures (Okazaki and Mendez, 2013).

CONCLUSION

The underlining theory for this review was a result of an assessment of the literature on mobile technologies which identified some models, types of technology, technology usage by SMEs, mobile applications in m-Commerce and criteria affecting commerce with mobile access among SMEs. The sections in review forms part of elements found to be solid indicators of mobile technologies adaptations by SMEs. However, basing on this review instead of using variables like the perceived usefulness (success factors mentioned earlier) and perceived ease of use with communication tools such as (social network, email, voice and text message). The study proposes an integration of the following external variables into any proposed model:

- Extension and unlimited sharing of information among customers and SMEs
- Improvement of communication between customers and SMEs and
- Changing lifestyle of customers and businesses (where attitude towards use will be compared with actual usage of mobile technologies by SMEs)

The study gives insight into a way of using mobile channels and what aspects a company needs to take into account when implementing solutions using mobile technology. The main objective here is to provide managers with decision support systems in addressing to questions such as: How can m-Commerce be embedded in a corporate (marketing) strategy, what are potentials of m-Commerce and what can m-Commerce not achieve what are prerequisites for the existing Information System (IS) architecture to allow for an affordable m-Commerce deployment and what are critical success factors for m-Commerce projects?

Among other things, it is important that SMEs should understand early years of m-Commerce were a technological success with the digital infrastructure created to sustain growth of m-Commerce. This will help marketers in conceptualizing all the important aspects underlying m-Commerce. SMEs should also be aware of the major forms of e-Commerce and mobile devices available in their target markets before engaging to m-Commerce practices. The three principals underlying m-Commerce from the review can be technology, business and society. SMEs should carefully analyse the opportunities and costs on these three main areas, failure to do so implementations of m-Commerce applications by SMEs will be unsuccessful and costly.

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