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Adaptation of the m-commerce value proposition for low-income markets.

By

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Abstract

This research project investigates the requirements or factors that will influence m-commerce adoption in low-income markets. The framework incorporated awareness, availability, convenience, affordability and acceptability as variables for m-commerce adoption in low-income markets.

Mobile commerce is the next step in the evolution of networked computing and is the utilisation of mobile communication for financial gain. In South Africa, the fast rate of mobile technology adoption has created an access footprint for m-commerce across the country. Businesses are adopting m-commerce into their business strategies to tap into these new markets.

Recently the potential commercial benefit in low-income markets is being explored by business. In South Africa the low-income market has been characterised by the foundation tier of the economic pyramid. Although this market is seen as extremely price sensitive and has little to no disposable income, the collective potential of it is considerable.

The research found that certain aspects of the framework were applicable. Awareness, knowledge and acceptability were seen to have the highest association with m-commerce adoption in the low-income market.

Keywords

M-Commerce, Low-income markets, Bottom of the pyramid (BOP), Value proposition.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

_____

Mohamed Zanulabedeen Mahomed

Date: _____

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Table of Contents

List of Figures

List of Tables

1: Introduction to the Research Problem

1.1. Introduction

Since its inception as a democratic country in 1994, South Africa has been aiming to overcome some of the strategic challenges it faces. Poverty alleviation, health care and Aids, crime, high levels of poverty, and low education levels are amongst the most significant priorities for the current government. South Africa has made limited progress over the last 16 years in these areas.

The Gini coefficient measures the disparity of income between the rich and poor of a country. The Gini Coefficient is the comparative ratio between the share of people with different income levels and the cumulative share of income earned by the percentage of the population (Young, 2010). It ranges from zero, which indicates perfect equality, with every household in that country earning the same, to a value of one hundred representing absolute inequality with one person or household earning all the wealth. Both of these extreme ends of the scale are not possible, but values in between represent the disparity level.

South Africa now holds second place behind Namibia for the highest level of disparity between the rich and poor with a value of 65 (CIA World Fact Book, 2009). The development of certain sections of society during the apartheid era has left a legacy that the current government has not overcome. The disparity does not just lie in the economy but also in the level and quality of education, and as well as in the creation of a large digital divide (Patel & Chipp, 2004).

South Africa's economic pyramid distinguishes between four levels of well being based on the South African Advertising Research Foundation's (SAARF) Living Standards Measure (LSM) (Haupt, 2006). The current debate around the economic value at the bottom tier or the Foundation level is ongoing. There are a multitude of factors that further distinguish these markets.

Infrastructure development such as roads, telecommunication, running water and formal housing are some of the factors that affect business from entering the low-income markets. South Africa has over the last few years seen the emergence and adoption of mobile technology across all levels of the economic pyramid. M-commerce adds value to consumers through its ubiquitous nature and companies can utilise the footprint within the low-income markets to deliver service and products to consumers.

This study investigates the merger between the value proposition of low-income markets and that of m-commerce. The framework outlines the areas that business has to consider when rolling out an m-commerce strategy to these sectors.

1.2. Background to Research Problem

1.2.1 Low – Income Market

Prahalad and Hart (2002) conceptualised the term the Bottom of the Pyramid (BOP) to depict the economy at the lowest tier of the economic pyramid. The BOP market has significant economic value to the Multinational Corporations (MNC) that are willing to invest into these markets (Prahalad & Hart, 2002). The BOP market represents around four billion people worldwide with an average annual income of

$2000 (Prahalad & Hart, 2002). Investing into these markets will benefit both consumers and businesses.

Chipp and Corder (2009) examined the collective nature of identifying low-income markets in South Africa. Low-income consumers may as individuals have very little buying power but as communities or households they increase their disposable income and their ability to purchase (Prahalad & Hart, 2002).

The concept and viability of the BOP market has been challenged by Karnani (2007) expressing that there is little economic value in this market. Consumers in these markets spend up to 75% of their income on basic necessities, such as food and transport thus leaving them with little left to purchase anything else (Karnani, 2007). Karnani (2007) further expressed the view that multinational corporations (MNC's) will exploit these markets if they decide to access them. Chipp and Corder (2009), Martinez and Carbonell (2007) and Prahalad and Hammond (2002) all make strong arguments to justify business development in this market.

Several studies (Karnani, 2007; Martinez & Carbonell, 2007; Prahalad & Hammond, 2002) highlighted that affordability or price is a significant value driver for the BOP segment. Although the sensitivity to price is a defining characteristic of the BOP market, consumers have very little choice in accessing services and goods at the same price as middle to upper income groups. The phenomenon of the "poverty penalty" is characterised by low-income consumers not being able to access goods due to location, as well as the lack of access to credit facilities (SadreGhazi, 2008, p. 6). Consumers are therefore forced to pay higher prices for goods and services and to look at high interest, informal loans for credit.

The 4A's framework for addressing low-income markets emphasizes availability, affordability, acceptability, and awareness as critically important in addressing access to the BOP market (Anderson & Billou, 2007):

- Availability: The extent to which customers can access goods and services.
- Affordability: The degree to which goods and services are made affordable to consumers.
- Acceptability: Willingness of consumers to utilise the product or service.
- Awareness: Level of understanding and knowledge of a product or service by the consumer.

SadreGhazi (2008) identified the characteristics of low-income markets as having low purchasing power, low skills and literacy, lack or poor basic infrastructure and poor location. Chipp and Corder (2009) argued that the BOP market in South Africa is identified as the Foundation tier of the South African economic pyramid.

The challenge of high levels of poverty and unemployment as well as the disparity between the have and have-nots in South Africa needs to be addressed. In 2005 world leaders at The World Summit on Information Society (WSIS) in Tunis highlighted amongst others, the need for economic growth in low-income areas by overcoming infrastructure constraints such as the digital divide. The digital divide is the difference between the level of access to information and communication technologies (ICT) between the rich and poor.

1.2.2 M-Commerce

The next step in the evolution of networked computing is mobile communications or m-commerce (Coursaris & Hassanein, 2002). M-Commerce is the utilisation of mobile communication for financial gain (Balasubramanian, Peterson & Jarvenpaa, 2002). Coursaris and Hassanein (2002) expressed the need for business to adopt m-commerce into their businesses to access this new and evolving market.

Clarke III (2008) looked at the value factors for m-commerce adoption as ubiquity, personalisation, localisation and convenience. Khalifa and Ning Shen (2008) as well as Moore and Chipp (2005) also provided frameworks for value and m-commerce adoption. Anckar and D'Incau (2002) developed a framework highlighting wireless value and mobile value as the propositions for consumers of m-commerce. Multiple frameworks exist with many similarities between them but no single model has overall acceptance.

Patel and Chipp (2004) explored the fast adoption rate of mobile technology in Africa and especially South Africa. They further investigated the benefits that m-commerce can bring into Africa by overcoming the distinct lack of general infrastructure. M-commerce adoption in South Africa is low due to a multitude of factors from awareness and usability, to cost and acceptability (Patel & Chipp, 2004). They also suggested the need for research on the impact of the complexity of the mobile devices and the awareness and knowledge around cellular phones in various market segments.

1.2.3 Problem Statement:

Value frameworks exist for addressing both the low-income markets and for adoption of m-commerce (Anderson & Billou, 2007; Clarke III, 2008; Moore, 2004). These frameworks exist in isolation and addressing m-commerce adoption into the low-income market will require further investigation. Mobile penetration in South Africa is significant and provides a possible access point for business and government to deliver services. This research seeks to address the challenges facing both the consumer and business. Consumers require access to services that are convenient, at low cost and enhance value. Business requires access to this potential market to utilise the large footprint that mobile telephony has in South Africa. This research aims to test a framework for business to use in developing an m-commerce strategy to penetrate the low-income area.

1.3. Research Objectives

The fundamental question that this research paper will serve to answer is, “What does business need to consider when developing a strategy to penetrate the Bottom of the Pyramid (BOP) using m-commerce?”

The main objectives of this research are:

Objective 1: To establish a framework for m-commerce value propositions in low-income markets.

Objective 2: To assess this framework in the BOP market.

Objective 3: To make recommendations on what can be done to implement m-commerce in the BOP market.

2: Literature Review

The literature review will discuss the emergence of m-commerce and its associated value proposition. The discussion will further explore the characteristics of the BOP market in the global and South African context. The question of value in low-income markets will then be investigated. Finally, the value requirements in the BOP segment will be looked at. The arguments presented will then be used to adapt the m-commerce value proposition for low-income markets.

2.1. M-Commerce – A Definition

The global impact on the business environment through the e-Commerce revolution is being challenged. The next step in the evolution of networked computing is mobile communications (Coursaris & Hassanein, 2002).

Balasubramanian, Peterson and Jarvenpaa (2002) conceptualised mobile-commerce (m-commerce) as the mobile, ubiquitous and continuous communication between two parties, with the aim for financial gain for either one of the parties in the short or long run. M-commerce has been portrayed to include services such as global positioning systems (GPS), remote monitoring devices, baby crib monitors and wireless network connections (Balasubramanian *et al*, 2002; Chipp & Ismail, 2004; Moore, 2004). M-commerce is clarified by the categorisation presented by Balasubramanian *et al* (2002):

- It involves communication between two parties, human or inanimate such as vehicle tracking systems.

- Either of the parties must be able to communicate whilst being mobile, in the sense that they are not obliged to remain in the same place to communicate.
- The communication must be sustained through substantial physical movement from one location to another.
- The communication must be primarily carried by electromagnetic waves or a medium that does not create direct sensory perception of the signals.
- The communication must seek to provide commercial benefit to at least one of the parties – or in the case of inanimate objects to the service provider or owner.

Clarke III (2008) and Danny (2009) defined m-commerce as the ability to purchase goods anywhere from a mobile device through the internet. This definition excludes voice and data communication between business-to-business (B2B) and business to consumers (B2C) such as short message service (SMS) and multimedia message service (MMS) (Chipp & Ismail, 2004). The latest development of m-commerce applications such as utilising chat sites (i.e. Mixit) or using MMS and SMS to promote and market products are also excluded from the definition. These exclusions are against the taxonomy of Balasubramanian *et al* (2002) who do not exclude these as applications of m-commerce. The current and future commercial benefit arising from utilising SMS or MMS to promote or market products or companies has not been explicitly included by Balasubramanian *et al* (2002) but rather they seem to endorse it as it fits the categorisation defined by them.

M-commerce is the natural extension of e-business because it offers additional value to the e-business processes (Coursaris & Hassanein, 2002). Anckar and D'Incau (2002 p.44) have depicted "Mobile commerce" as "e-commerce over mobile devices". Clarke III (2008) shares this idea by stating that m-commerce is an opportunity for e-commerce to expand beyond the limitations of the fixed line computer, thus m-commerce provides additional channels for e-commerce.

Adoption of m-commerce will broaden the current scope of e-commerce but will change consumer behaviour (Coursaris & Hassanein, 2002). Companies must realise the potential of m-commerce on business. Chipp and Ismail (2004, p. 393) state that even Microsoft changed their slogan from "a computer on every desk in every home" to "empower people through great software, any time, any place and on any device" in response to Nokia's credo of "a computer in every pocket".

Balasubramanian *et al* (2002) utilising the time and space matrix to delineate the effect of m-commerce adoption showed that value can be derived by both consumers and business in adopting m-commerce. The ubiquitous and convenient nature of m-commerce makes it the new phenomenon (Chipp & Ismail, 2004). It is critical to note that the business models that were adopted for e-commerce and wireless internet cannot simply be translated into m-commerce business models (Clarke III, 2008). Nohria and Leestma (2001) argued that m-commerce's unique properties have to be considered when developing mobile offerings and should not involve the simple moving of online offerings to a mobile platform.

The value to be derived by consumers from m-commerce is dependent on the effectiveness of business in encapsulating the ubiquitous nature of m-commerce in

their offerings, while maintaining similar levels of service using online or e-commerce. Limitations of speed and screen size associated with mobile channels (Chipp & Ismail, 2004), are fast being overcome by the evolution of m-commerce technologies. The evolution of mobile technologies from global system for mobile communications (GSM) to third generation networks (3G) and from high-speed uplink packet access (HSUPA) to worldwide interoperability for microwave access (WiMax) is testimony that wireless speeds are faster than ever before. New technologies in cellular phones and netbooks, such as the Apple iPhone and the Amazon Kindle, provide a fulfilling experience to users on their mobile devices.

M-commerce, through its fast pace of adaptation and penetration through mobile devices, has made it critical for business to utilise it in the normal course of business. The ubiquitous and easy access makes consumers available to do business and access information at any time from any place.

2.2. M-Commerce Value Proposition

2.2.1 Value

The value proposition defines the relationship and interdependence between the supplier offering and the fulfilment of the consumer's needs (Clarke III, 2008). Heard (1993) defined customer value as being what the customer gets (reliability, quality, experience, convenience) from the transaction or use of product or service versus what he has to give up (price, cost, time) resulting in the creation of value and defining the attitude towards the product. There are various typologies of user value and many terms to describe value: desired value, service value, customer value, perceived value and consumer value (Ishmatova & Obi, 2009). Value has

various definitions depending on the environment and context. In this study, the focus is on what customers perceive they are receiving as well as what they want to receive. The bearing on customer perception of what they are receiving or what they want will directly influence their decision to accept or reject a product (Ishmatova & Obi, 2009)

The perceived value associated with a product has a direct bearing on the acceptance or rejection of that product in terms of a consumer's decision making (Anckar & D'Incau, 2002). The establishment of a value proposition in terms of the delivery model for m-commerce will determine the success of suppliers delivering their product or service to consumers.

2.2.2 M-Commerce Value

Ishmatova and Obi (2009) emphasised that value created by mobile devices supports the changes associated with a more connected and mobile world. Business and marketers have to thus ensure that they develop and build services and applications around consumer needs utilising the potential of the mobile technology to derive value for customers (Moore, 2004). Nohria and Leestma (2001) raise caution against businesses developing services based on technology as opposed to user needs. A fundamental aspect of extracting value and thus enabling acceptance of products or services is dependent on the ability of business to satisfy the perceived or desired needs of customers. Moore (2004) brings to light that there is no value in the actual technology but rather that value lies in the effectiveness of the technology to deliver information, service and applications.

2.2.3 Ubiquity and Convenience

Electronic or e-commerce offers customers value through low cost and high speed of services (Clarke III, 2008). Balasubramanian *et al* (2002) and Khalifa and Ning Shen (2008) agree that the fundamental differentiator of m-commerce is its ubiquitous nature. The ubiquitous nature of m-commerce delineates space and time and therefore makes it available from any place and at any time (Balasubramanian *et al*, 2002; Khalifa & Ning Shen, 2008). Traditional services were bound by time and place (Balasubramanian *et al*, 2002). For example if you needed to book a plane ticket, you would be required to go to the airline or travel agent. E-commerce first introduced flexibility by enabling the booking of an air ticket at any time but from a fixed location (Balasubramanian *et al*, 2002). M-commerce completely sets aside the restrictions of time and space and enables consumers to book a ticket from any place and at any time using their mobile devices. Clarke III (2008) and Moore and Chipp (2005) viewed ubiquity and convenience as individual value elements. However ubiquity is the essence of m-commerce and is the basis of convenience. The fact that m-commerce is available from any place and at any time creates value through this convenience. Ubiquity therefore forms part of the convenience factor experienced by consumers.

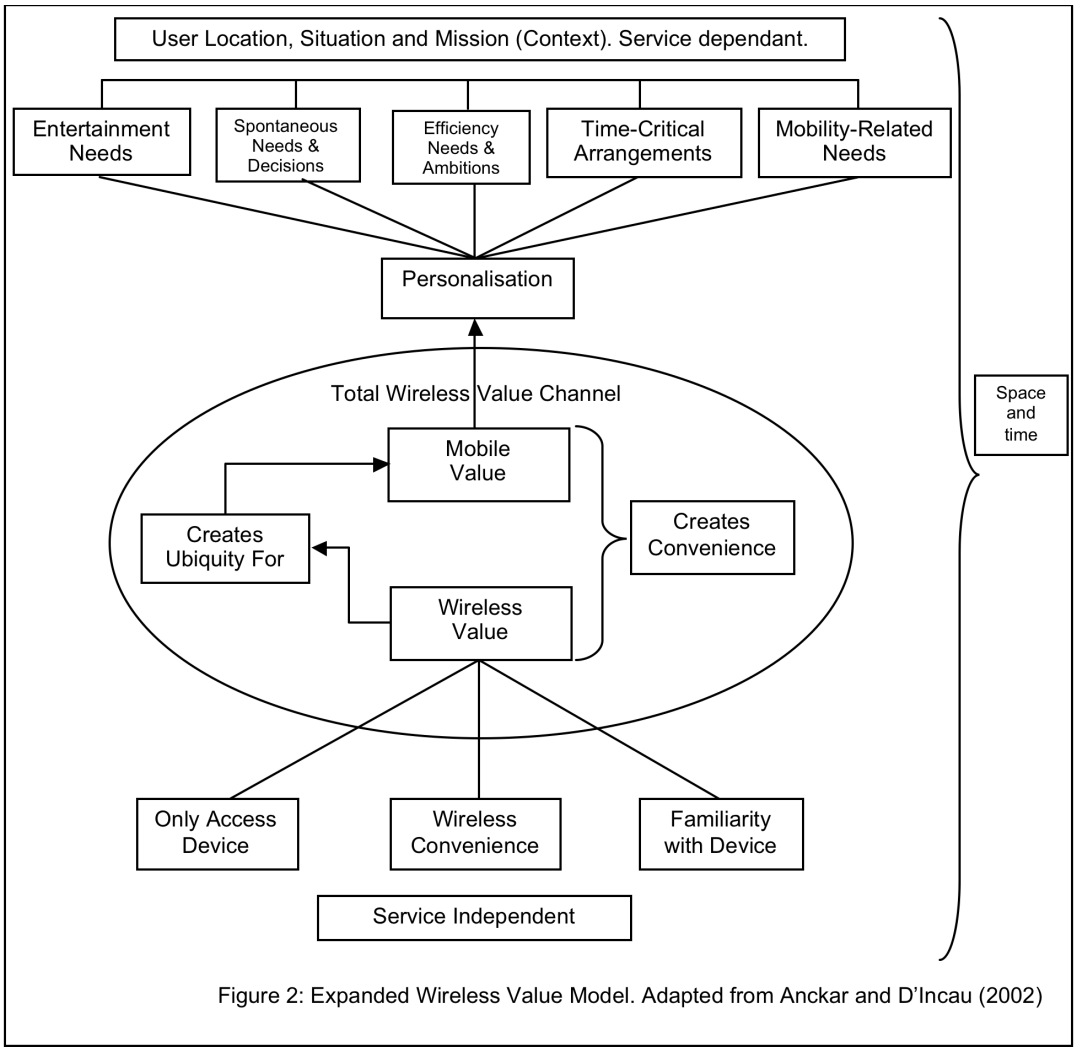


Figure 2: Expanded Wireless Value Model. Adapted from Anckar and D'Incau (2002)

Figure 2-1: Wireless Value Model. Adapted from Anckar and D'Incau (2002)

2.2.4 Wireless and Mobile Value

Anckar and D'Incau (2002) articulated that the ubiquitous nature of m-commerce does not fully encapsulate the true value to be derived to a consumer. Anckar and D'Incau (2002) drew attention to two further constructs in their Wireless Value Model – Figure 2-1 above that define the value to consumers as wireless and mobile value. Wireless value was derived from it being a cheap alternative to fixed line computers, providing wireless convenience as well as the familiarity that consumers had with the devices (Anckar & D'Incau, 2002). The wireless value

attributes defined by Anckar and D'Incau (2002) can be correlated to the general convenience factor that was discussed in 2.2.3 above. The cost aspect to the wireless value can be broken down further into cost of an actual computer as well as exploring the costs of using m-commerce. The aspect of familiarity of the device is also associated with two other factors, which are knowledge or awareness of both services and the device and the usability aspect of the m-commerce service.

Mobile value was the context within which consumers would utilise the service for spontaneity, entertainment needs, time critical requirements and mobility related requirements (Anckar & D'Incau, 2002). The value derived by a consumer is dependent upon the requirements of a consumer at a point in time (Anckar & D'Incau, 2002). Mobile value is thus an extension of context and although Anckar and D'Incau (2002) covered the generic context within which m-commerce would provide value, the context itself would not be seen as value drivers.

Clarke III (2008) stated that m-commerce seeks to provide value through ubiquity, convenience, localisation and personalisation. Clarke III's (2008) value proposition model supports both Balasubramanian *et al* (2002) and Anckar and D'Incau (2002). Moore (2004) incorporated the value propositions of both Anckar and D'Incau (2002) and Clarke III (2008) to establish the m-commerce value hierarchy (see Figure 2-2 below). Moore (2004) identifies mobile value, wireless value and usability as potential value propositions from m-commerce.

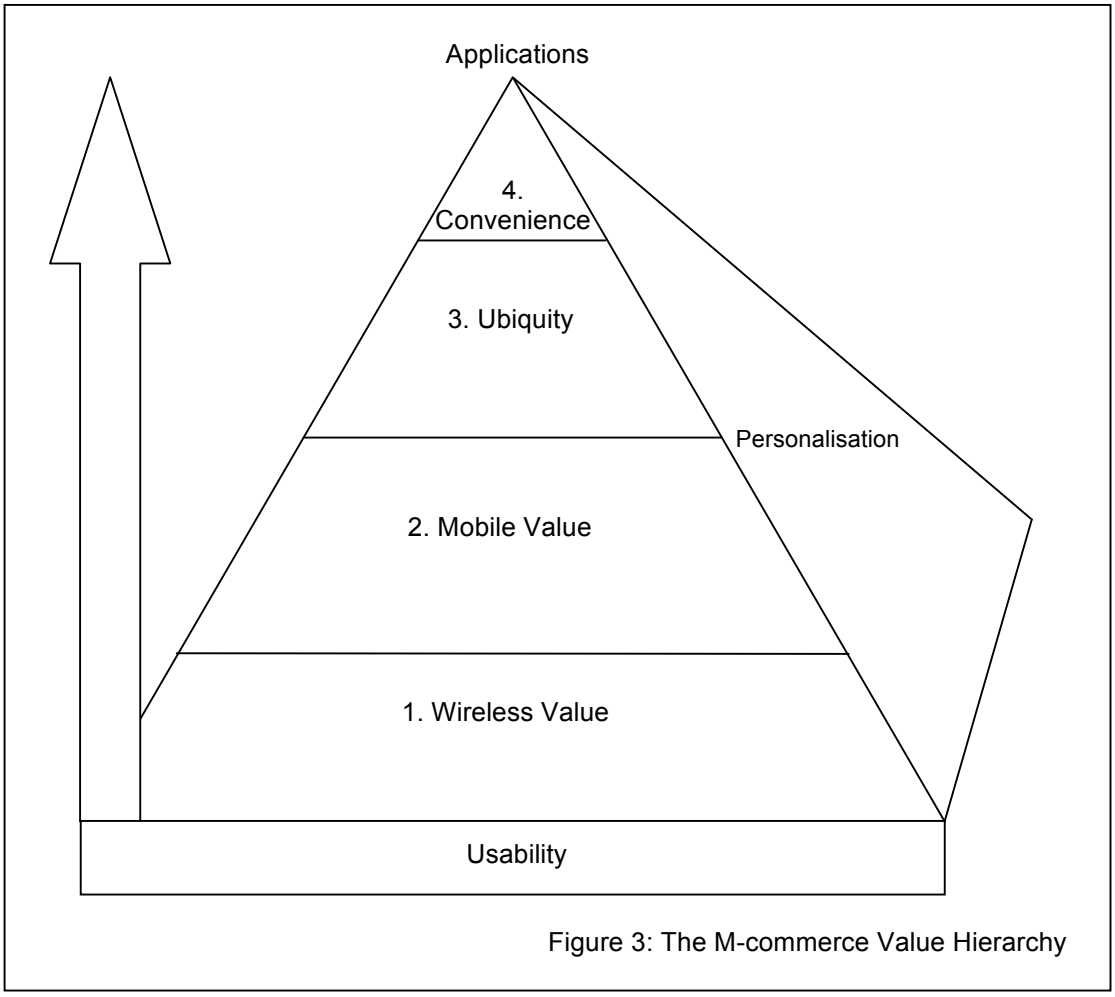


Figure 3: The M-commerce Value Hierarchy

Figure 2-2: M-Commerce Value Hierarchy. Adapted from Moore (2004)

2.2.5 Usability and Knowledge

The usability aspect of m-commerce is the key success factor for adoption amongst consumers (Chipp & Ismail, 2005; Condos, James, Every & Simpson, 2002). Chipp and Ismail (2005) and Condos *et al* (2002) highlighted many usability issues including the limited screen size and keyboard, and complicated navigation of applications. In their view, usability was the fundamental aspect of developing m-commerce applications before exploring any other value criteria (Chipp & Ismail, 2005; Condos *et al*, 2002). For example, a consumer may need to use his/her

mobile device to book an online ticket for a movie but the task is extremely cumbersome and confusing so the consumer may rather opt to find the nearest internet access point or buy directly at the cinema. Usability also incorporates the aspect of access to a clear and strong signal to utilise the m-commerce service (Condos *et al*, 2002; Patel and Chipp, 2004). Consumers will not utilise a service if they do not have access to it.

Usability	High	1. Trivial use of m-commerce	2. Ideal state of m-commerce and high user adoption
	Low	3. M-commerce failure and lack of user adoption	4. Frustrating use of m-commerce offset by high value
		Low	High
	Value (Time and Space)		

Figure 2-3: M-commerce Usability - Value Matrix. Adapted from Moore (2004)

Moore (2004) highlighted the impact of usability and value and its impact on consumers (see Figure 2-3). Ideally service providers of m-commerce will need to ensure that their service is extremely usable and that it provides value in the time/space dimension (Moore, 2004).

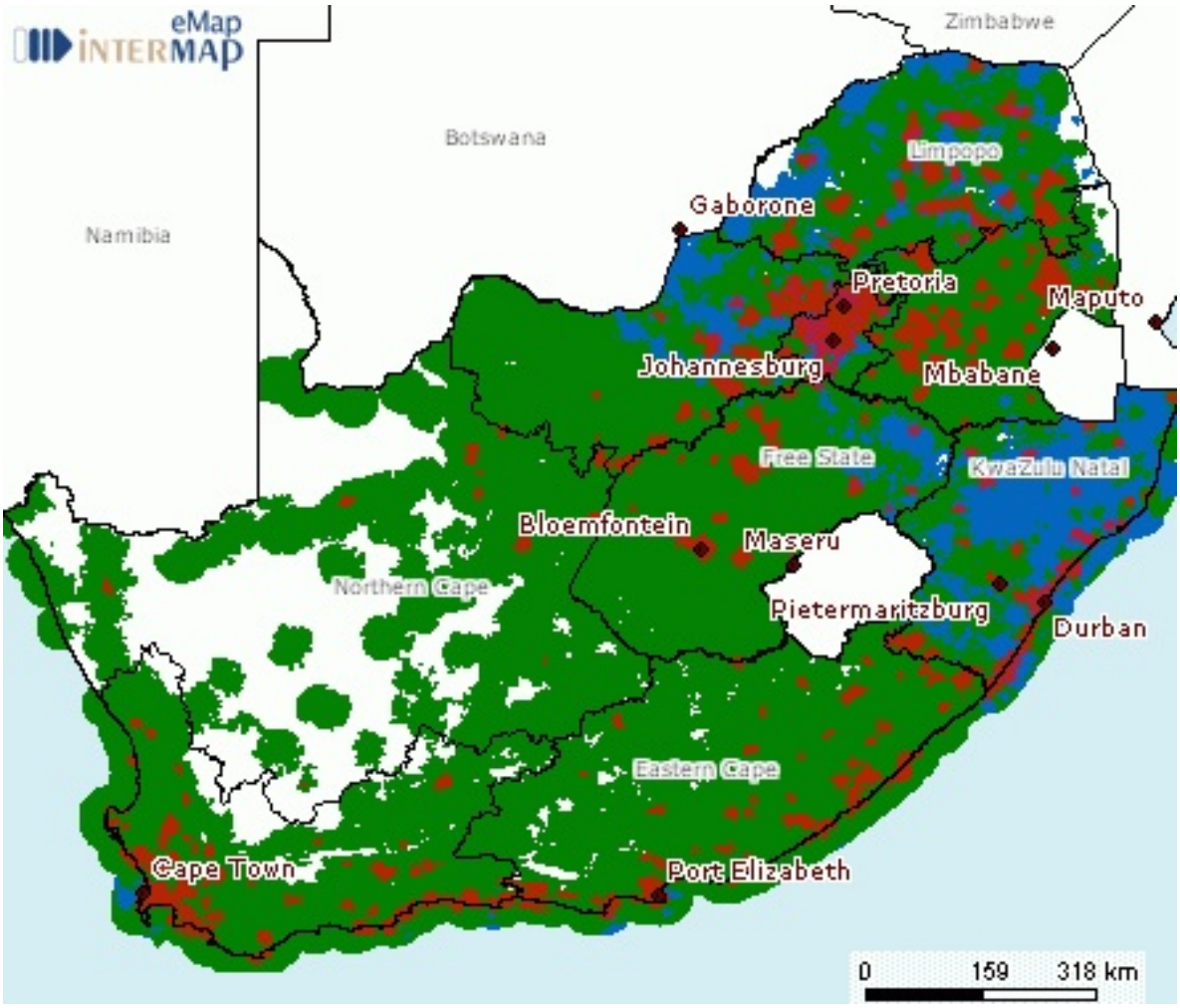
2.3. M-Commerce in Africa

Patel and Chipp (2004) brought to light the fast adoption rate of mobile technology in Africa and especially South Africa. They further investigated the benefits that m-commerce can bring into Africa by overcoming the distinct lack of general infrastructure. They also indicated that m-commerce adoption in South Africa is low

and suggested that conducting research on the impact of the complexity of the mobile devices and the awareness and knowledge around cellular phones in various market segments would prove useful in understanding the adoption of m-commerce.

Coverage of high-speed data in South Africa has been slow and tedious. 3G coverage is available in most metropolitan areas, whilst the rural areas are still to obtain coverage. Vodacom has rolled out general packet radio services (GPRS) and enhanced data rates for GSM evolution (Edge) technologies to most remote areas in Southern Africa thus enabling some level of access to broadband (Vodacom, 2010). Figure 2-4 highlights the coverage area in South Africa by the largest cellular provider, Vodacom.

Levels and complexity of service and applications to consumers is therefore dependent on the access they have to high-speed data connectivity. Most coverage areas are limited to Edge or GSM/GPRS connectivity, which will imply that SMS and MMS m-commerce services would be most suited for these environments. Businesses wanting to target consumers in the metropolitan areas can consider services and applications that require higher levels of bandwidth whilst being comfortable that the connectivity in these areas will not undermine the experience of the user.



Key	
	GSM/GPRS
	Edge
	3G/ HSDPA/ HSUPA

Figure 2-4: Vodacom Coverage Map – Source Vodacom

2.4. Low Income Markets

2.4.1 The bottom of the pyramid

Prahalad and Hart (2002) originated the phrase “Bottom of the Pyramid” in defining the low-income market as the bottom tier of the income pyramid. Prahalad and Hammond (2002) divided the world economic pyramid into three tiers -Figure 2-5. The top tier represents the world’s wealthy. The second tier is representative of the world’s middle class, including lower and upper middle-income groups earning between $2,000 and $20,000. Prahalad and Hammond (2002) assert that “65% of the world’s population earn less than $2,000 each year – that’s 4 billion people” and this constitutes the third tier.

Defining the bottom of the pyramid varies amongst authors. Louw (2008) presented the BOP market segment into two broader categories. BOP 1 was defined as the bottom end with a total population of 2.8 billion people earning less than $2 a day. The upper segment of the BOP, or BOP 2 was identified as the remainder of the BOP market (Louw, 2008).

Karnani (2007) however argued that earnings can vary between $6 and $16 a day for the cases stated by Prahalad and Hart (2002). Karnani (2007) further states his scepticism around an actual value proposition in the BOP market.

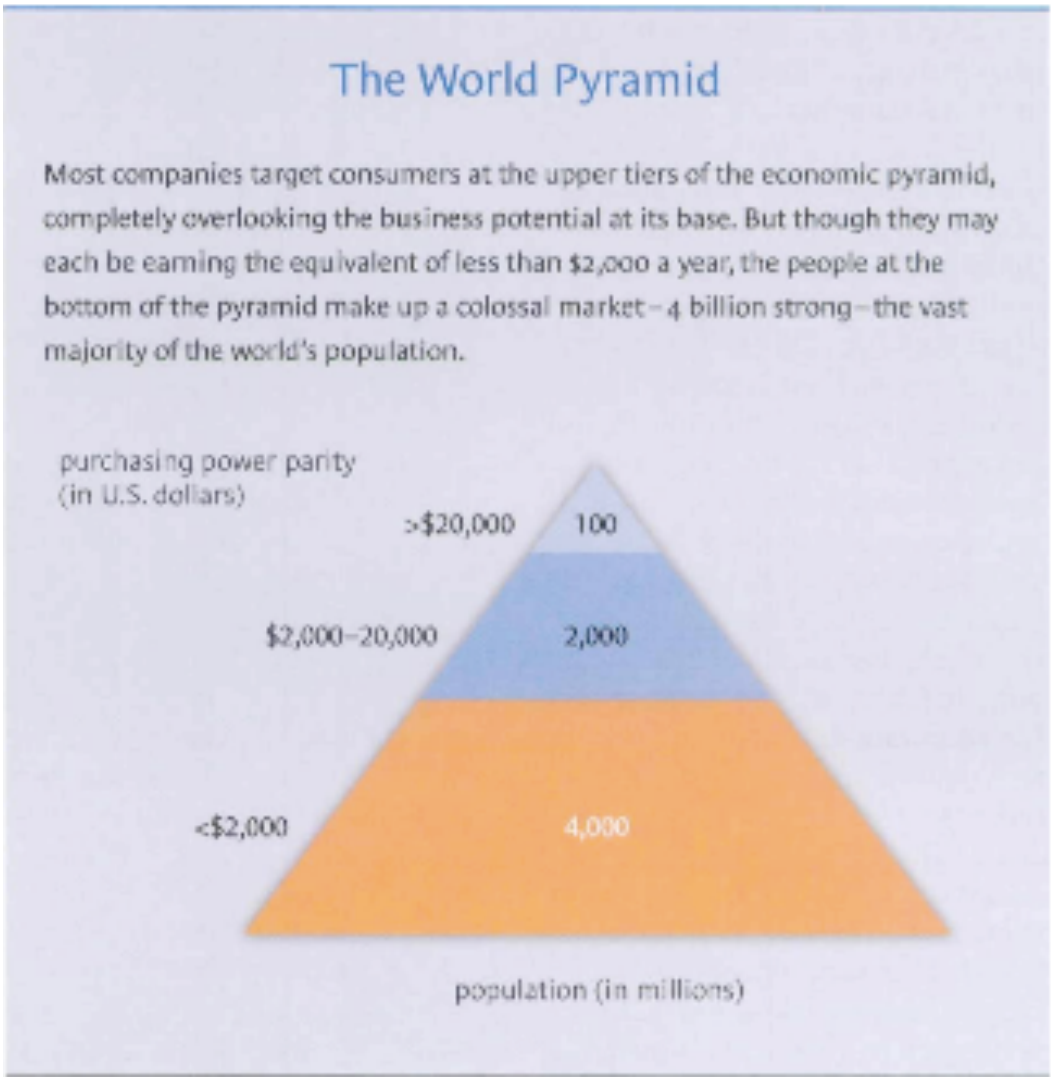


Figure 2-5: World Economic Pyramid. Prahalad and Hammond (2002)

2.4.2 Identifying low income markets

SadreGhazi (2008) explained that the first step to accessing the low-income markets is to identify their characteristics. Chipp and Corder (2009) extensively look at the distinguishing factors that determine whether the BOP can be identified as individuals or as a collective using the South African Advertising Foundation's (SAARF) Living Standards Measure (LSM). Generically, the low-income markets have been identified through income levels. K. Chipp (personal communication,

June 02, 2010) investigated the characteristics or principle components that may distinguish the low-income tier in the South African economic pyramid. Similarly SadreGhazi (2008) defines certain characteristics of low-income markets in the generic sense as purchasing power, location and diversity, skills and awareness and finally institutions and infrastructure. These characteristics make it difficult to conduct business in these environments.

2.4.3 Purchasing Power

A discerning characteristic of low-income markets is their low levels of disposable income (Prahalad & Hammond, 2002). SadreGhazi (2008) identified two ways in which this problem manifests itself: (1) low purchasing power and (2) lack of access to credit. Consumers in this market generally rely on a fluctuating daily income as opposed to a monthly income, which makes it difficult for them to make high once-off purchases (Prahalad & Hammond, 2002). Banks are reluctant to extend credit to consumers from low-income markets, which results in them paying higher interest rates to informal lenders in an effort to overcome the credit problem. Consumers in higher income markets have access to credit, which enables high-end purchases.

Prahalad and Hammond (2002) argue that consumers in low-income markets are prone to pay higher prices for basic goods and services as opposed to their counterparts in middle to high-income markets, a phenomenon termed “poverty penalty” (SadreGhazi, 2008 p. 6). Consumers in these areas do not have access to big retailers and chain stores to perform comparative shopping due to high transport costs. “In fact, throughout the developing world, urban slum dwellers pay,

for instance, between four and 100 times as much for drinking water as middle and upper class families" (Prahalad & Hammond, 2002 p.50).

2.4.4 Location and Diversity

Low-income markets generally have sub-standard or underdeveloped infrastructure (SadreGhazi, 2008). The lack of basic infrastructure such as water, electricity, roads and media makes it difficult for businesses to access and educate consumers in these markets about their products and services (Anderson & Billou, 2007). In light of limited infrastructure, it will be useful to see how mobile technology is used to access and deliver services to these markets (SadreGhazi, 2008).

2.4.5 Skills and Awareness

Products that are easy to use generally lead to a higher acceptance by consumers. There have been many cases where products that have been highly acclaimed by its producers have failed due to their complexity. Although this phenomenon is not specific to low income environments, it has tremendous implications (SadreGhazi, 2008).

Low-income populations have a considerable amount of illiterate and poorly skilled individuals. SadreGhazi (2008) further stated that almost one fifth of adults globally are functionally illiterate. This therefore poses a challenge to businesses to ensure that their products and services are simple and easy to use (SadreGhazi, 2008).

2.4.6 Institutions and Infrastructure

The final characteristic of low-income markets is that they generally face political instability, volatile exchange rates and underdeveloped physical infrastructure as compared to more advanced or developed economies. Although basic infrastructure is taken for granted in advanced economies, low-income markets usually are faced with fluctuating or no electricity, hostile environments, such as heat and moisture, which makes it more difficult to do business in these markets (SadreGhazi, 2008).

2.5. Market at the Bottom of the Pyramid

Prahalad and Hart (2002) stated that stimulation of commerce and development at the BOP would result in the creation of a more stable and more inclusive world. This can be accomplished by the active involvement of multinational corporations (MNC's), financial aid into developing nations and improved governance of developing nations (Prahalad & Hammond, 2002).

In Tunis 2005, the World Summit on the Information Society committed itself to uplifting and promoting sustainable development through bridging the digital divide. World leaders identified ICT as a key enabler to promoting economic development through ICT infrastructure and inclusivity. The aim of this initiative was to ensure that the low-income markets have adequate economic development through ICT infrastructure, skills development, business development and inclusivity.

According to Prahalad and Hammond (2002), assumptions around the commercial viability of doing business at the bottom of the pyramid are largely outdated. Although the average per capita income of such markets may be extremely low,

the aggregate buying power can prove to be significant (Martinez & Carbonell, 2007; Prahalad & Hart, 2002; Simanis, 2009).

Prahalad and Hammond (2002) examined the case in point of a Mumbai shantytown, Dharavi, where 85% of households have a television. In an area of extreme poverty, residents still find means to procure televisions which is a phenomenon known as acceptance of circumstance (Prahalad & Hammond, 2002). Residents understand that access to a home in Mumbai is unrealistic as is access to running water and electricity. Their reality is to improve their current situation rather than save for a rainy day.

Prahalad and Hart (2002) and Martinez and Carbonell (2007) state that the general misconception around the lower income group is that trade is incredibly cheap and there is no room for further competition in these markets. The reality is that consumers at the bottom of the pyramid generally pay much higher prices than the middle class consumer. The unavailability of services leaves the bottom of the pyramid consumer vulnerable to exploitation by small-scale entrepreneurs who may radically increase the price of services and goods (Martinez & Carbonell, 2007; Prahalad & Hammond, 2002).

The BOP market has a potential to grow to around 1 billion people by 2015 and companies that have established footprints in these environments have access to a huge market (Prahalad & Hart, 2002). The critical barrier to entry in these environments is not the lack of buying power but rather the lack of information and communications technologies (ICT) and infrastructure (Prahalad & Hart, 2002). In

recent times wireless communications technologies have made it easier and more cost effective to deliver services in these environments.

Karnani (2007) refutes claims that there is an actual fortune at the very bottom of the pyramid. He states that the BOP market is small and is not likely to be profitable to large corporations. He goes on to emphasize that targeting the BOP may lead to exploitation through misguided marketing. Martinez and Carbonell (2007) disputed these negative misconceptions about doing business with low-income consumers. The dispute is based on the following prejudices:

- "The poor have no money". However as a collective in a family or community there is money (Martinez & Carbonell, 2007, p 51).
- "Spending by the poor is restricted to basic needs". The poor realise that since they cannot afford a car or home as this is not a realistic option, they spend their money on things that will improve their quality of life such as televisions and gas stoves (Martinez & Carbonell, 2007, p 51).
- "The poor only buy cheap things". Consumers in low-income markets do not have the opportunity to get bulk discounts, they end up paying much higher prices for the same goods than the middle to upper income consumer. Large companies with economies of scale and effective and innovative distribution and marketing plans can seize the opportunity to service this market at attractive margins and still pass the benefit to the consumer (Martinez & Carbonell, 2007, p 51).

2.6. Marketing at the BOP

Simanis (2009) is of the belief that the commonality amongst the world poor referenced as the BOP is not actually a market. He stated that only by conditioning the consumers to believe that they require a product will a market be established. However markets have various definitions and various attributes. The broadest meaning of a market as defined from an economist point of view is a collection of buyers and sellers that transact over products or services (Kotler & Keller, 2009). Figure 2-6 illustrates the relationship between the industry and the market, where the seller sends goods and services to the market, in return for money and information (Kotler & Keller, 2009). The BOP is therefore a market as transactions occur between consumers and the industry, albeit in a small and informal scale. MNC and large companies through their capacity and resources can create a more formal and profitable market in this area.

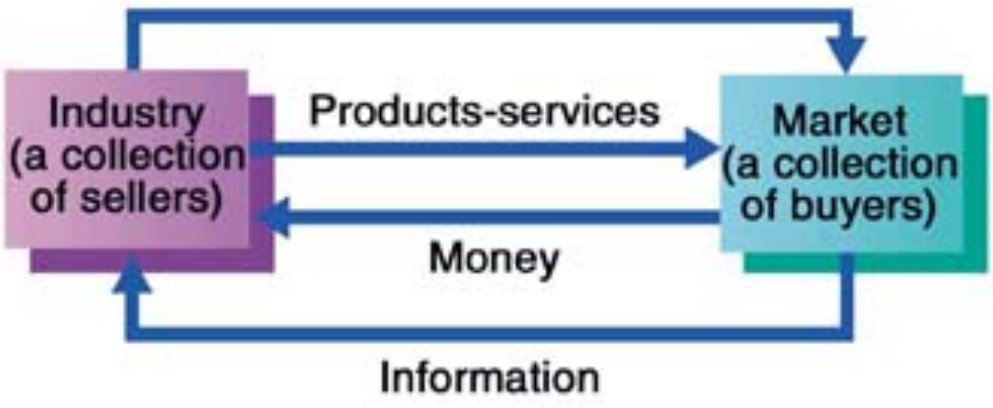


Figure 2-6: Simple Marketing System. Adapted from Kotler and Keller (2009)

Simanis (2009) does however make some valid arguments in the approach that needs to be adopted when entering the BOP market . Simanis (2009) alluded that effective entry into these markets consist of the following approaches.

2.6.1 Community involvement

Community involvement in shaping and developing the products will result in products that are suitable to the community and are accepted by the community. The products in this market need to address consumer needs. Suitability will also be informed by the level of awareness that consumers have of the product (Simanis, 2009).

Solae, a subsidiary to the DuPont Co. in India, producers of soy protein, went to a rural village in Andhra Pradesh and a slum city in Hyderabad. They recruited a group of about 20 women interested in starting their own business. This group co-developed the business concepts by developing a service to assist housewives in cooking great tasting and healthy meals using the soy protein (Simanis, 2009).

Initially the women began cooking and perfecting the recipes in their own communities and inviting their close families to perfect their culinary skills. This grew to having neighbourhood cooking days and finally to a cooking outreach program. The concept was so successful that before the formal launch the group was already fielding numerous requests for the product (Simanis, 2009).

2.6.2 Multiple Product Approach

Companies should not focus on a single product when engaging the BOP market. They need to use different strategies and products so that there is a better chance

of a product being accepted (Simanis, 2009). The multiple hit and miss approach suggested by Simanis (2009) may not always be feasible as it may frustrate customers that are exposed to too many products. This approach may also tarnish the relationship between the community and supplier.

KickStart, a non-profit group, developed a manually powered irrigation pump that empowered low-income consumers to make money. Based on feedback from consumers the product was re-engineered to become lighter and more portable. The MoneyMaker irrigation pumps ended up being utilised for a host of other applications such as washing cars and watering plants. The product eventually counted for 98% of KickStart unit sales prompting the organisation to change focus (Simanis 2009).

2.6.3 Positive Product Marketing

Companies should make an effort to ensure that their products depict multiple uses as opposed to a single use. Simanis (2009) suggested that the marketing efforts have to be vast and cover all types of usage for a particular product. He goes on to state that the marketing should only provide the positive effects of the products, and not create a negative picture where the implications of not having the product are highlighted.

Procter and Gamble Co. (P&G) developed a product called PUR that converted murky water into pure drinking water. The product was easy to use, shelf stable considering distribution challenges and retailed for a mere 10 cents per sachet that could purify three gallons of water. P&G's approach to show the harm associated with unclean drinking water, as opposed to all the benefits that was associated with

the product was one of the causes of failure for the product in the market. PUR's marketing could have instead shown PUR to produce great tasting soups and foods, rice and curries or juices (Simanis, 2009).

2.7. Accessing the BOP – the 4A's Framework

Karnani (2007) stated that the BOP market is highly price sensitive as consumers spend close to eighty percent of their meager income on food, clothing and fuel. Karnani (2007) and Prahalad (2002) agree that the consumers in the BOP market is focused on firstly satisfying its basic needs and are thus highly cost conscious. Price and costs are however not the only factors to consider when addressing low income markets.

Anderson and Billou (2007) in terms of their 4A's framework for addressing low-income consumers identified four areas that business should consider when approaching low-income markets: Availability, affordability, acceptability and awareness (see Figure 2-7 below).

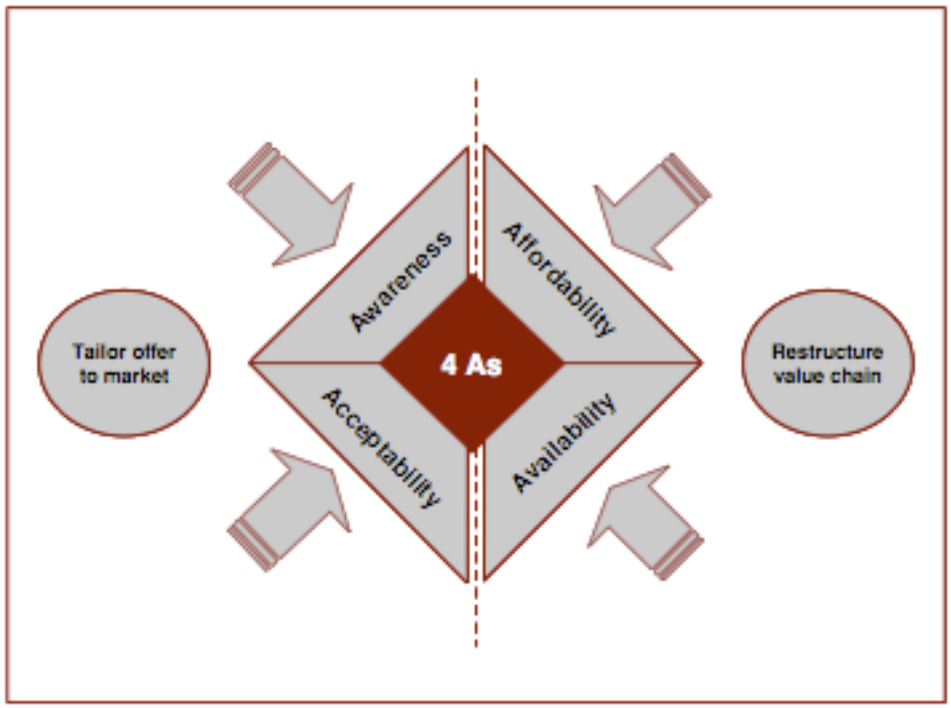


Figure 2-7: 4 A's Framework for addressing low-Income markets. Adapted from Anderson and Billou (2007)

2.7.1 Availability

Low-income markets are generally faced with the challenge of access and availability of services and goods (Anderson & Billou, 2007). Unlike the developed world, distribution channels are highly underdeveloped and are a huge hurdle for consumers as well as businesses to overcome (Anderson & Billou, 2007; SadreGhazi, 2008).

Smart Communications, a mobile company in the Philippines, faced a challenge of distributing pre-paid cards to non-urban and rural areas. Although the company had network coverage in these areas, it relied on storeowners and mobile resellers to distribute its cards. The company recognized that supply chain management to these remote areas would prove difficult and costly to manage. Smart developed

an over-the-air payment system that allowed retailers to load a customer's airtime using a specially designed retailer sim card. Smart thus reduced its distribution costs, as well as increased its market share (Anderson & Billou, 2007).

2.7.2 Affordability

Cost and price sensitivity is the second hurdle facing low-income consumers. As discussed earlier, Prahalad and Hammond (2002), as well as Karnani (2007) recognized that the major part of the meager incomes earned by low-income consumers is spent on essentials. This makes the consumer in this market acutely sensitive to price (Anderson & Billou, 2007).

At the beginning of 2010 in South Africa, Vodacom reduced its prepaid voucher from five rand to two rand. Smart Communications in the Philippines attempted this with great success, which enabled it to extract economic value out of the lowest income market as well as provide consumers in these markets with the flexibility to control their spending on telecommunications (Anderson & Billou, 2007).

2.7.3 Acceptability

The third challenge identified by Anderson and Billou (2007) is gaining acceptance for the product or service by the consumer. The products and services have to be adapted to the specific needs and requirements of the target market that one is to serve or penetrate (Simanis, 2009). Although this may be basic product development philosophy, the possibility of low-income consumers participating in impulsive purchasing behaviour is minimal due to the small amount of disposable income. Low-income consumers generally have to save or use informal loans to

obtain cash for any purchase and will ensure the purchase fulfils their requirements.

In India's low income communities, displaying or showing off luxury is considered a cultural taboo. Hair grooming amongst Indian women is about the only indulgence they have, ensuring the woman rarely leave home with their hair out of place. There is also an ingrained belief that low-cost shampoos are harsh for the hair, leaving women with no choice but to use soap for their hair. Unilever identified this issue and rather than marketing low-cost shampoos they opted to create a soap that had beneficial ingredients for the hair. They utilised an accepted norm and added value, making it easier for the product to gain acceptability (Anderson & Billou, 2007).

2.7.4 Awareness

The fourth constraint is the ability to create awareness and knowledge of products and services amongst the low-income market (Anderson & Billou, 2007). SadreGhazi (2008) focused on the lack of conventional media such as televisions and infrastructure to support marketing. In order for business to create a level of awareness, it needs to invent itself to the market.

Smart Communications created a complete marketing plan to create awareness around its products. They invested heavily in billboards along roads, in urban and rural areas, as well as point of sales marketing material. Smart also used training and support systems to further create awareness around their products (Anderson & Billou, 2007).

2.8. BOP – South African Context

Chipp and Corder (2009) emphasised that in the South African context, defining and identifying the BOP as a collective rather than an individual would be a better measure of determination. Chipp and Corder (2009) cite Haupt (2006) that South Africa has an empirically derived definition for all social strata based on the term Living Standards Measure (LSM) which is based on households.

The South African economic pyramid has four tiers: Foundation, Core, Buttress and Apex (Chipp & Corder, 2009). The foundation tier being defined as LSM's 1-4, Core being LSM's 5-6, Buttress being LSM's 7-8 and the Apex of the pyramid being LSM's 9-10 (see Figure 2-8). Chipp and Corder (2009) defined the South African BOP as the foundation tier, which is LSM's 1 to 4.

The South African BOP market can thus be defined as individuals earning a mean monthly income of $8.33 per day or R1, 312.00 a month and a household earning $13.14 a day or R2, 069.00 a month. The household variables by pyramid groups, illustrate the possible identification characteristics of each tier (Chipp and Corder, 2009).

Chipp and Corder (2009) investigated the role of collectivism in the South African BOP market, finding that the BOP market is better represented as a collective whole rather than as individuals. The social and economic structure of the bottom tiers of the South African Economic pyramid lean towards the collective or household character due to high levels of unemployment, dependence on government grants, child support, disability and old age pensions (Chipp & Corder, 2009). The poorer communities generally make financial decisions as a collective

household rather than as individuals due to the limited amount of disposable income.

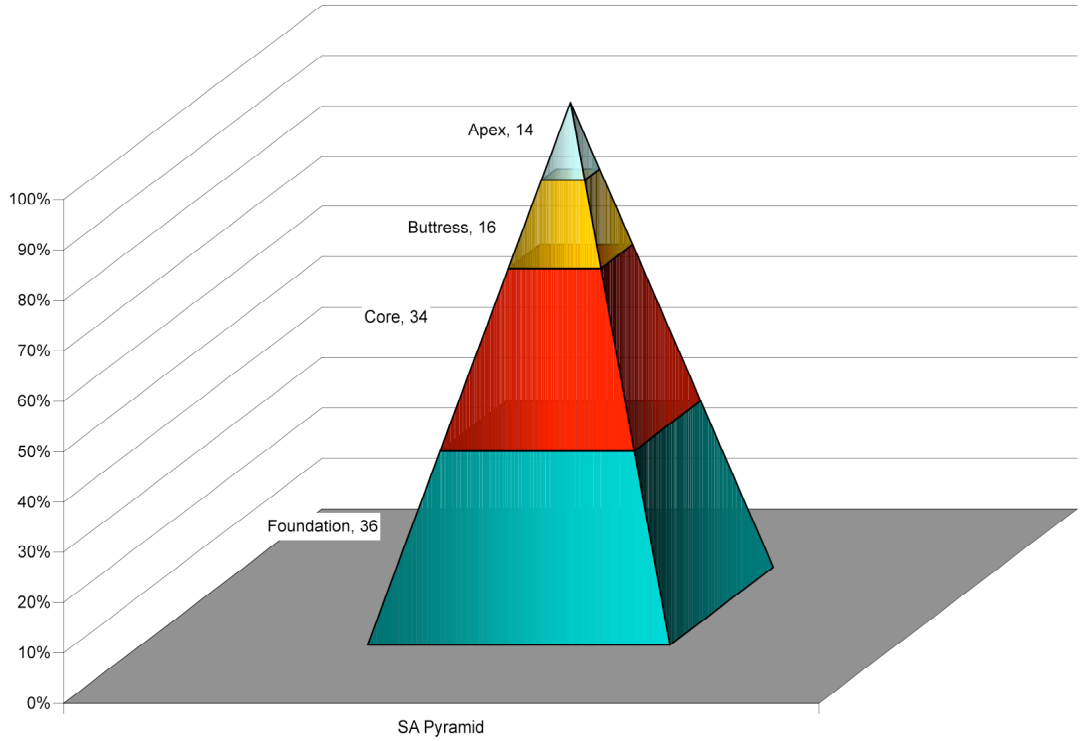


Figure 2-8: South African Economic Pyramid. Source - Chipp and Corder (2009)

The LSM also utilises variables describing the availability of resources to a household as opposed to an individual. K. Chipp (personal communication, June 02, 2010) utilised the LSM contribution variables to determine predictors of the Foundation tier. Her findings highlighted that the foundation tier can be identified by the availability of a maximum of one of the following seven predictors:

- Hot running water
- PC / Desktop / Laptop
- Motor vehicle in the household

- Vacuum cleaner or polisher
- Electric stove
- Microwave
- Flush toilet in/out

These predictors will be used to identify the foundation tier as part of the research.

2.9. Defining the framework for m-commerce in the BOP

The literature has identified key attributes and value propositions required for m-commerce adoption and accessing the BOP market. There are some overlaps in terms of the propositions in both contexts and these will be merged to obtain a single model for m-commerce adoption in low-income markets. These overlaps are highlighted in green in Table 2-1 below.

	Ubiquity and Convenience	Wireless and Mobile Value	Usability and Knowledge	Availability	Affordability / Costs	Acceptability	Awareness
Ubiquity and Convenience	x	x					
Wireless and Mobile Value	x	x			x		
Usability and Knowledge			x				x
Availability				x			
Affordability		x			x		
Acceptability						x	
Awareness			x				x

Key	
	Same Construct
	Overlapping Constructs

Table 2-1: M-commerce an BOP determinants

Wireless value and mobile value discussed in 2.2.4 above indicated the similarity of these constructs to ubiquity and convenience as well as to the cost factor. Usability and knowledge can be tested in a similar way as awareness as both seek to ensure that the consumer knows the product or service. That is, the consumer has the knowledge about the product and that the product is easy to use. These constructs can therefore be merged into a single construct – awareness and knowledge.

The m-commerce adoption framework for low-income markets in Figure 2-9 will thus consist or the following five constructs:

- Convenience (covering ubiquity, convenience and a part of wireless value)
- Awareness and Knowledge (covering usability, knowledge and awareness)

- Availability
- Affordability (covering costs and affordability)
- Acceptability

Figure 2-9: M-commerce adoption framework for low-income markets

3: Research Propositions

The purpose of this study is to assess the constructs of the m-commerce adoption framework for low-income markets. The determinants as highlighted in the framework for effective adoption and penetration of m-commerce in low-income markets are:

- Awareness and knowledge – the level of awareness created by businesses in terms of their m-commerce offering to consumers in low-income markets. The consumer's knowledge of how the products work and the usability of the m-commerce products.
- Availability – m-commerce products' efficacy is determined by infrastructure availability to support the product or service.
- Convenience – the ability of the m-commerce product to create convenience to the consumer through its ubiquitous nature.
- Affordability – the price and cost of the product to the consumer in relation to conventional means of receiving the same product or service.
- Acceptability – the level of acceptance of the product or service by the consumer.

Although the framework is based on tested models, the combination of the tested models is still not validated. This research aims to validate the framework in a low-income market.

3.1. Research Proposition 1: Awareness and Knowledge

The first proposition hypothesises a relationship between awareness and knowledge on m-commerce adoption. A consumer can only reap the benefits and utilise m-commerce if he is aware that it exists. Awareness is not limited to knowing that there is a service. Awareness incorporates the ability of a user to actually use the service, as well as the usability of the application or service.

Proposition 1a: Awareness of m-commerce services will lead to the adoption of the service.

Proposition 1b: Knowledge of how to use and the ease of use of the m-commerce service will lead to the adoption of m-commerce.

3.2. Research Proposition 2: Availability

M-commerce services are dependent on the availability of infrastructure to support the service. Infrastructure may include the strength of a signal, the amount of data required for the application or the type of cellular phone required to access the service.

Proposition 2a: Availability of the m-commerce will lead to the adoption of the service.

3.3. Research Proposition 3: Convenience

A user will utilise the m-commerce service if it provides benefit to him or her. The ubiquitous nature of m-commerce in providing convenience to the consumer allows access from any place and at any time.

Proposition 3a: The convenience provided by m-commerce will lead to the adoption of the service.

3.4. Research Proposition 4: Affordability

Low-income markets are highly price sensitive. The cost of the product does not have to be cheap if it offsets other costs such as transport.

Proposition 4a: Cost effectiveness of m-commerce will lead to the adoption of the service.

3.5. Research Proposition 5: Acceptability

Product success is dependent on the level of acceptance it gains.

Proposition 5a: Acceptability of m-commerce will lead to the adoption of the service.

4: Research Methodology

4.1. Introduction

The research methodology was a quantitative survey done in a low-income area of South Africa. The focus was on informal settlements in Gauteng due to the convenience and commercial aspects of conducting a survey in these areas. Gauteng is the economic hub of sub-Saharan Africa and is the economic gateway into the rest of Africa.

4.2. Research Design

The research design was a quantitative study to test the assumptions of the relationship between the constructs of the framework against the dependent variable of adoption of m-commerce in the BOP market. The research followed a descriptive survey that consisted of obtaining primary data through a self-administered questionnaire. As stated by Zikmund (2003), descriptive research aims to describe the characteristic of a population. Descriptive research is also based on known knowledge of the subject matter as opposed to exploratory research where little is known on the subject. The nature of the primary data collected enabled statistical analysis to evaluate the relationships, if any, between the dependent and independent variables. This study therefore followed a descriptive design.

A five point Likert scale was used to measure and rate responses (Zikmund, 2003). Weights assigned to the scores enabled the data to be statistically evaluated and correlated (Zikmund, 2003).

The independent variables were defined as: awareness and knowledge, availability, convenience, affordability and acceptability and the dependent variable is the adoption of m-commerce.

4.3. Population

The population consisted of cellular phone users aged 16 years and older that live in the Rabie Ridge, Kaalfontein Extension 22 and Tswelapele informal settlements of Gauteng. The targeted population included individuals in households that fall in the Foundation tier according to the South African economic pyramid consisting of LSM's 1-4.

The population excluded all other individuals that do not meet the above criteria.

4.4. Sampling Method and Size

Ideally, a sample is one that creates a perfect representation of a population with all relevant features of a population included in the sample in the same proportions (Zikmund, 2003). This was however very difficult to achieve in practise. The approach adopted for this research was to choose three low-income communities in the Gauteng region. The type of sampling methodology that resulted in the selection of Rabie Ridge, Kaalfontein Extension 22 and Tswelapele were for their convenience.

Systematic sampling is a methodology in which an initial starting point is randomly selected and every n^{th} number is selected (Zikmund, 2003). Within the three localities chosen, the systemic sampling methodology was used. In each environment a single point on the boundary of the locality was randomly chosen. In

a clockwise direction around the boundary seven starting points were selected after every fifth household on the boundary. At each of the starting points, interviews were conducted at every fifth household within the locality on the left hand side of the pathway or road. In the event that the household failed to have a cellular phone user, the next house on the left was approached.

From each starting point, five questionnaires were administered thereby obtaining 35 questionnaires per locality. A total of 105 questionnaires were administered.

4.5. Unit of Analysis

The unit of analysis in this study were individual cellular phone users that form part of the identified population.

4.6. Questionnaire Design

The questionnaire was designed to test the research propositions stated in Chapter 3. The questionnaire was divided into seven sections. Section one obtained the demographic details such as race, gender, age and cellular phone ownership. Section one further tested if the interviewee is part of LSM's 1-4, using the characteristics of the foundation tier as discussed in 2.8. Section two tested the adoption and utilisation of a cellular phone in terms of m-commerce activity as defined in Chapter 3. Sections three to seven tested the constructs of the framework.

4.7. Data Collection

A face-to-face method of surveying was conducted to ensure that the questions were communicated effectively to establish clarity. The survey provided a quick,

inexpensive and efficient way of collecting data from the identified population. It further assisted in establishing if the interviewees met the criteria for participating in the interview in that they were part of the LSM 1-4 economic cluster and that they owned a cellular phone.

Three data capturers conversant in English and the common local languages conducted the interviews. Each data capturer was trained regarding the context of the survey and in administering the questionnaire.

The data collected was summarized using various descriptive measures and summaries of association for instance correlation analysis. The following analyses were carried out in order to answer the research questions.

4.8. Data Analysis

4.8.1 Reliability Analysis

The reliability of the questions used for Awareness, Knowledge, Affordability, Convenience, Affordability and Acceptability was tested using the Cronbach's alpha. Coefficient Alpha (Cronbach's alpha) is defined as "a measure of internal consistency reliability, which is the average of all possible split-half coefficients resulting from different splitting of the scale items" (Malhotra, 1999, p. 282). Cronbach's alpha is used to test whether or not a group of questions is a reliable measure of an underlying variable - such as awareness. The value of alpha ranges from 0 to 1. The group of questions is a reliable measure if the values of alpha are greater than 0.5.

In an effort to obtain the best Cronbach's alpha and thereby the most reliable measure of the underlying variable, reliability analysis called "Scale if Item Deleted" was performed on each variable. This analysis tests the impact of each question on the overall Cronbach's alpha if they are removed from the list and thus enables the group of questions with the highest reliability to be used.

4.8.2 Correlation and Logistic Regression Analysis

A correlation analysis was performed to establish the strength of the association between Awareness, Knowledge, Availability, Convenience, Affordability and Acceptability. The simple correlation coefficient is a "statistical measure of the co-variation, or association, between two variables" (Zikmund, 2003, p. 551).

A logistic regression analysis was carried out to test the effectiveness of these constructs as predictors of the adoption of m-commerce. Logistic regression is a form of regression analysis in which the dependent variable is a categorical variable and the possible explanatory variables can be either numerical or categorical. In this research the dependent variable investigated was the element of adoption of m-commerce and the explanatory variables investigated were the constructs: Awareness, knowledge, availability, convenience, affordability and acceptability.

Logistic regression tests whether the independent variables have a statistically significant effect on the dependent variable. For it to be accepted that a dependent variable has a statistically significant effect on the overall outcome, the p-value for that variable in the regression has to be less than or equal to 0.05, which means that the variable is significant at a 95% confidence level.

4.9. Research Limitations

A limitation of this research is that it was only done in informal settlements in Gauteng. It excluded the low-income markets in semi – rural and rural sectors of South Africa as the identified locations are in close proximity to urbanised areas in Gauteng. The sampling methodology should ideally have been probability sampling so that the results could be generalised to the population.

The questionnaire was not pretested to evaluate the ability of the instrument to effectively test the constructs. Pretesting would have ensured that all the variables tested had a high reliability value.

There could have been deliberate falsification due to unwillingness to participate in the survey. The inability bias may also play a role in limiting the effectiveness of the research in that respondents may not have understood the questions correctly, even though well-trained data capturers administered them.

5: Results

5.1. Adoption of m-Commerce

The aim of this research was to investigate factors that have an influence on the adoption of m-commerce. Adoption of m-commerce was measured based on the response to the list of statements in Table 5-1 below. Respondents were asked whether or not they participated in any of the m-commerce services listed in the statements below.

M-Commerce Services	**Yes %** **n = 103**	**No %** **n = 103**
Play games on the phone	71	29
Enter competitions	45	55
Send SMS's	90	10
Use chat services (e.g MXit)	22	78
Send "Please call me	91	9
Send an MMS	43	57
Download ringtones or logo's	36	64
Browse the internet	28	72
Download or listen to music – excluding the radio	65	35
Take photo's	66	34
Take a video recording	64	36
Mean Values	**6.23**	**4.77**

Table 5-1: Uses of cellular phone

The summary of responses to these statements is shown in Appendix B: Data Analysis - Adoption of M-commerce. From the responses to these questions it is clear that some of the elements are widely adopted. For instance, 90% of the respondents “sent SMS’” or “Please call me”. However, only 45% of respondents entered mobile competitions, 36% downloaded ring tones and only 28% browsed the internet on their mobile phones. In order to further investigate the non-adoption of these elements of m-commerce, the relationship with specific possible factors of interest was investigated.

5.2. Reliability Analysis

Table 5-2 below summarises the Cronbach’s alpha for each of the independent variables. The questions and statements testing the constructs are listed in Appendix A – Questionnaire.

Reliability Analysis

	Cronbach's alpha	No. of items
Awareness	.511	3
Knowledge	.657	3
Availability	.222	3
Convenience	.535	5
Affordability	.299	4
Acceptability	.664	3

Table 5-2: Summary Reliability Analysis

5.2.1 Awareness Reliability

The Cronbach’s alpha for awareness is 0.511, which means that the group of questions used is a reliable measure of awareness. The scale statistics in Table 9-12 in Appendix C: Scale Reliability Analysis testing each individual questions

impact as a reliable measure of awareness indicates that the collective group in total has the highest reliability measure.

5.2.2 Knowledge Reliability

The Cronbach's alpha for knowledge is 0.657, which means that the group of questions used is a reliable measure of knowledge. The scale statistics in Table 9-13 in Appendix C: Scale Reliability Analysis testing each individual questions impact as a reliable measure of knowledge, points out that the collective group in total has the highest reliability measures.

5.2.3 Availability Reliability

The Cronbach's alpha for availability is 0.222, which means that the group of questions used is not a reliable measure of availability. The scale statistics in Table 9-14 in Appendix C: Scale Reliability Analysis tested each individual question's impact as a measure of reliability. Omitting Q1: "Does your cellular phone have an sms facility" improves the Cronbach's alpha to 0.359. With the omission of Q1, the reliability measure is still relatively low.

5.2.4 Convenience Reliability

The Cronbach's alpha for convenience is 0.535, which means that the group of questions used is a reliable measure of convenience. The scale statistics in Table 9-15 in Appendix C: Scale Reliability Analysis testing each individual questions impact as a reliable measure of convenience indicates that the collective group in total has the highest reliability measures.

5.2.5 Affordability Reliability

The Cronbach's alpha for affordability is 0.299, which means that the group of questions used is not a reliable measure of affordability. The scale statistics in Table 9-16 in Appendix C: Scale Reliability Analysis tested each individual question's impact as a measure of affordability. Omitting Q1: "The costs for using mobile services are clear and understandable" improves the Cronbach's alpha to 0.322. With the omission of Q1, the reliability measure is still relatively low.

5.2.6 Acceptability Reliability

The Cronbach's alpha for acceptability is 0.664, which is the highest value of all the variables, tested. This means that the group of questions used is a reliable measure of acceptability. The scale statistics in Table 9-17 in Appendix C: Scale Reliability Analysis testing each individual questions impact as a reliable measure of acceptability indicates that the collective group in total has the highest reliability measures.

5.2.7 Conclusion

The reliability analysis indicated the need to omit some of the questions to improve the Cronbach's alpha for the availability and affordability constructs. The regression and correlation analysis were completed on the improved Cronbach's alpha - Appendix D: Regression and Correlation Analysis on improved Cronbach's Alpha. The impact on this analysis was negligible as the overall outcome was the same.

5.3. Correlation and Logistic Regression Analysis

The dependent variable for the regression was the adoption of m-commerce or the uses of cellular phone as depicted in Table 5-1. A scale was developed for the adoption of m-commerce by assigning a score of 1 for each positive answer to the 11 measures of adoption to each respondent. The scale therefore ranged from 0 – 11. This scale was used as the dependent variable for the regression analysis.

A scale was also developed for each of the predictor or independent variables depending on the type of questions and the number of questions used. Table 5-3 below summarise the scale for each of the independent variables.

Variable	Question Type	No. of Questions	Scale
Awareness	Interval Scale 1-5	3	3 – 15
Knowledge	Interval Scale 1-5	3	3 – 15
Availability	Option Yes/No	3	0 – 3
Convenience	Interval Scale 1-5	4	4 – 20
Affordability	Interval Scale 1-5	4	4 – 20
Acceptability	Interval Scale 1-5	3	3 - 15

Table 5-3: Independent variable scale

5.3.1 Correlation Analysis

The strongest relationships that stand out are the positive relationship between adoption and awareness, adoption and knowledge, as well as adoption and acceptability. The remaining variables have a low correlation with adoption and thus not a strong association. Interestingly between the other variable, the

relationships between knowledge and convenience and acceptability and affordability stand out.

Correlations

		Adoption	Awareness	Knowledge	Availability
Pearson Correlation	Adoption	1.000	.364	.511	.192
	Awareness	.364	1.000	.337	.233
	Knowledge	.511	.337	1.000	.226
	Availability	.192	.233	.226	1.000
	Convenience	.236	.205	.391	.175
	Affordability	.279	.333	.328	.219
	Acceptability	.379	.344	.304	.270

Table 5-4: Correlation Analysis A

		Convenience	Affordability	Acceptability
Pearson Correlation	Adoption	.236	.279	.379
	Awareness	.205	.333	.344
	Knowledge	.391	.328	.304
	Availability	.175	.219	.270
	Convenience	1.000	.337	.300
	Affordability	.337	1.000	.438
	Acceptability	.300	.438	1.000

Table 5-5: Correlation Analysis B

5.3.2 Regression Analysis

The output of the logistic regression analysis is listed in Table 5-6 below.

Coefficients

Model		Standardized Coefficients	t	P-Value.	95.0% Confidence Interval for B	
		Beta			Lower Bound	Upper Bound
1	(Constant)		-1.025	.308	-4.981	1.589
	Awareness	.157	1.682	.096	-.026	.320
	Knowledge	.397	4.132	.000	.217	.619
	Availability	.012	.138	.891	-.560	.643
	Convenience	-.017	-.183	.855	-.233	.194
	Affordability	.011	.116	.908	-.189	.213
	Acceptability	.201	2.058	.042	.008	.437

Table 5-6: Regression Analysis

Proposition 1a: Awareness of m-commerce services will lead to adoption of the service.

The p-value of awareness is 0.096, which is a little greater than 0.05, which indicates that it is not statistically significant in predicting the adoption of m-commerce. The significance level of awareness is less than 0.1. This shows that the awareness variables predict the adoption of m-commerce at a 90% significance level.

Proposition 1b: Knowledge of how to use and ease of use of m-commerce services will lead to adoption of the service.

The p-value of knowledge is 0.000 which indicates that it is statistically significant in predicting the adoption of m-commerce. This shows that the knowledge variables predict the adoption of m-commerce to a 95% significance level.

Proposition 2a: Availability of m-commerce services will lead to adoption of the service.

The p-value of availability is 0.891 which indicates that it is not statistically significant in predicting the adoption of m-commerce. This shows that the availability variables had little to no effect on predicting the adoption of m-commerce.

Proposition 3a: Convenience provided by m-commerce services will lead to adoption of the service.

The p-value of convenience is 0.855 which indicates that it is not statistically significant in predicting the adoption of m-commerce. This shows that the convenience variables had little to no effect on predicting the adoption of m-commerce.

Proposition 4a: Cost Effectiveness of m-commerce services will lead to adoption of the service.

The p-value of affordability is 0.908 which indicates that it is not statistically significant in predicting the adoption of m-commerce. This shows that the affordability variables had little to no effect on predicting the adoption of m-commerce.

Proposition 5a: Acceptability of m-commerce services will lead to adoption of the service.

The p-value of acceptability is 0.042 which indicates that it is statistically significant in predicting the adoption of m-commerce. This shows that the acceptability variables predict the adoption of m-commerce to a 95% significance level.

5.4. Prioritising the Constructs

5.4.1 Frequency Analysis

Awareness and knowledge was the most important construct with an importance rating of 95% followed by Availability with a 94% rating. Convenience and Acceptability had the lowest importance rating with 79% and 75% respectively.

Table 9-21 to Table 9-25 in Appendix E: Prioritising the Constructs details how the respondents prioritized the awareness and knowledge, availability, convenience, affordability and acceptability in terms of importance for them to utilise mobile services.

Prioritising the Constructs					
Construct	Rating	Not Important	Important	Very Important	Total Important and Very Important
Awareness and Knowledge	1	5	52	43	95
Availability	2	6	69	25	94
Affordability	3	8	57	35	92
Convenience	4	21	60	19	79
Acceptability	5	25	59	16	75

Table 5-7: Constructs Priority

5.4.2 Association between construct priority

The table below shows the correlations between the priorities given to the different constructs. The correlation coefficient ranges from -1 to 1. A value from -1 to -0.5 is a strong negative correlation, -0.5 to 0 a weak negative correlation, 0 to 0.5 a weak positive correlation and 0.5 to 1 a strong positive correlation. In order to calculate the correlations the categorical variables were first transformed to discrete variables using Multiple Correspondence Analysis.

Correlations Transformed Variables

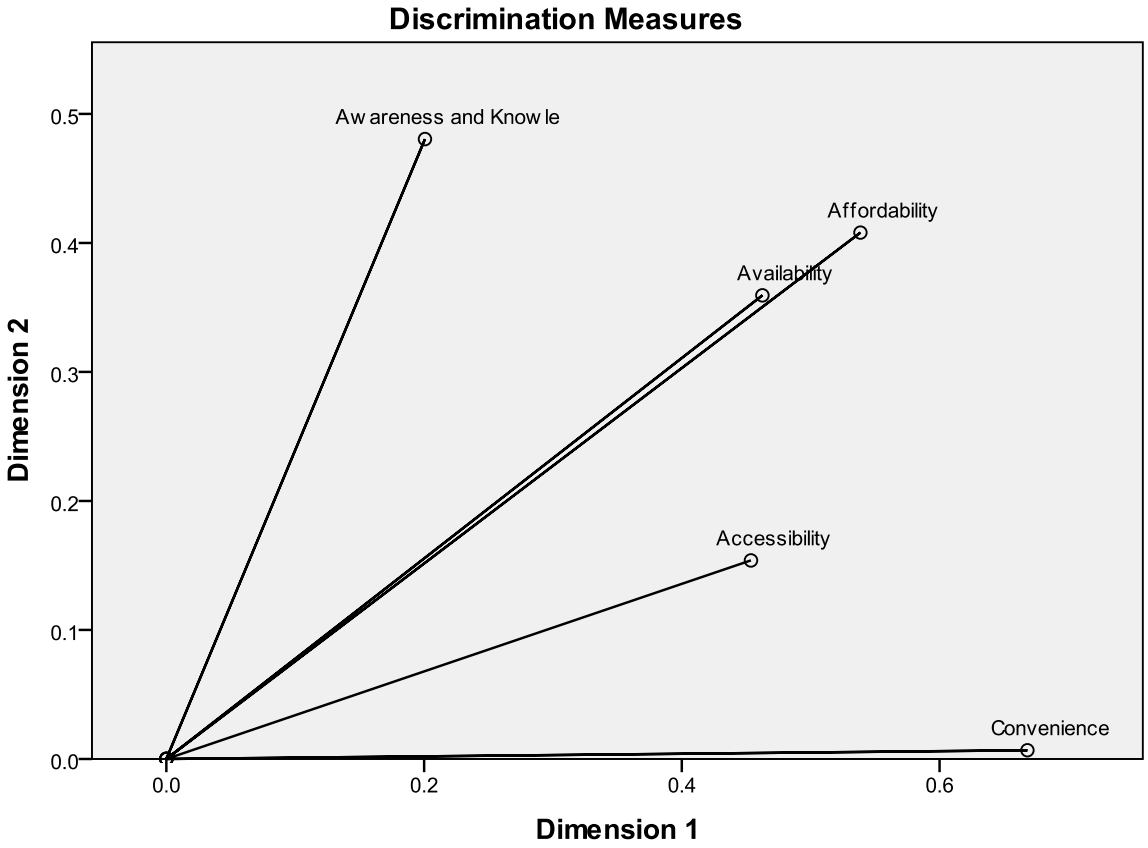
Dimension:1

	Awareness and Knowledge	Availability	Convenience	Affordability	Acceptability
Awareness and Knowledge	1.000	.147	.193	.337	.130
Availability	.147	1.000	.494	.292	.322
Convenience	.193	.494	1.000	.485	.451
Affordability	.337	.292	.485	1.000	.335
Acceptability	.130	.322	.451	.335	1.000
Dimension	1	2	3	4	5

Table 5-8: Correlation Analysis of Construct Priority

5.4.3 Mapping

Figure 5-1 below maps how close the variables were to each other in terms of the priorities given to them by respondents. Affordability and Availability were the most similar in terms of the priority assigned to them.



Variable Principal Normalization.

Figure 5-1: Variable Principle Normalisation - Construct Priority

6: Chapter 6: Discussion of Results

6.1. Adoption of M-commerce services

Amongst the eleven services explored for adoption in the survey, it was interesting to note the variances in the levels of the various services. Those with the highest adoption rates ranging upwards from 70% were “sending sms’” or “please call me” and playing games on the phone.

The second tier of adoption ranging between 40% - 70% included the following services:

- Entering competitions using the cellular phone
- Sending MMS
- Downloading or listening to music – excluding the radio
- Taking photos
- Taking a video recording

The least adopted services under 40% were using “chat services”, “downloading ring tones and logo’s” and “browsing the internet” on the cellular phone.

The high adoption rate on the majority of the services is an indication of the potential of m-commerce services in the low-income market. This supports the literature by Prahalad and Hammond (2002) that there is a potential market at the bottom of the pyramid.

6.2. Research Proposition 1: Awareness and Knowledge

The first proposition hypothesises a relationship between awareness and knowledge on m-commerce adoption. A consumer can only reap the benefits and utilise m-commerce if there is awareness that the services and products exist. Awareness is not limited to knowing that there is a service. Knowledge incorporates the ability of a user to actually use the service and the ease of use of the service.

Proposition 1a: Awareness of m-commerce will lead to adoption of the service.

Proposition 1b: Knowledge of how to use and the ease of use of the m-commerce service will lead to adoption of the service.

6.2.1 Discussion of findings on Proposition 1a: Awareness

SadreGhazi (2008) found that the location and underdeveloped infrastructure of low-income markets generally limited the influence and availability of media to create awareness of products and services to these markets. Anderson and Billou (2007) provide a description of awareness in the low-income market as the degree to which customers are aware of products and services. SadreGhazi (2008) supported the argument that the lack of access to conventional media such as television reduced the impact of advertising and awareness campaigns on the low-income market.

The awareness section of the questionnaire consisted of three statements (see Appendix A – Questionnaire, Section 2) which were related to the awareness levels of m-commerce services. The statements identified had a reliability measure

of 0.511 according to the Cronbach's alpha analysis. A rating of above 0.5 provides a level of confidence that the statements used provide adequate reliability in measuring the impact of awareness of the adoption rate.

The correlation analysis indicates a strong positive relationship between awareness of m-commerce services and its adoption. This indicates that in order to achieve higher levels of m-commerce adoption in low-income markets, a significant effort has to be made to create awareness of these services. Anderson and Billou (2007) and SadreGhazi (2008) suggested companies devise strategies to create awareness of products and services to effectively penetrate the market.

The regression analysis established a p-value of 0.066. This indicates that the awareness of m-commerce associated with the adoption of the service is at a 90% level of significance. This further supports the arguments by Anderson and Billou (2007) and SadreGhazi (2008) in that the awareness level of consumers in low-income markets of products and services is vitally important to the successful adoption of products and services. The results are supported by the literature.

6.2.2 Discussion of findings on Proposition 1b: Knowledge

Knowledge and usability aspects of m-commerce are a key success factor for adoption amongst consumers (Chipp & Ismail, 2005). Apart from the device limitation in terms of screen size and the keyboard, the application has to be user friendly and easy to use (Chipp & Ismail, 2005).

Low-income markets pose the additional challenge of considerable numbers of functionally illiterate and poorly skilled individuals (SadreGhazi, 2008). Business is

therefore challenged to ensure that products and services developed are simple and easy use – even more so than when developing for other market segments.

The knowledge section of the questionnaire consisted of 3 statements (see Appendix A – Questionnaire, Section 2) which were related to the knowledge levels of m-commerce services. The statements identified had a significant reliability measure 0.657 according to the Cronbach's alpha analysis.

The correlation analysis indicates a strong positive relationship of 0.511 exists between knowledge of how to use and ease of use of m-commerce services and its adoption. This robustly supports the proposition that changing awareness in terms of educating consumers as well as developing services that are simple and easy to use is critical in the successful adoption of m-commerce services.

The regression analysis confirmed a positive relationship between knowledge and adoption ($p < 0.05$). This indicates that the knowledge criteria of m-commerce are associated with the adoption of the service at a 95% level of significance. This implies that the proposition that knowledge of how to use and ease of use of m-commerce service will lead to the adoption is supported by the literature.

In prioritising the constructs - 5.4, awareness and knowledge were rated as the most important as compared to the rest of the constructs.

SadreGhazi (2008) highlights failures in adoption of services where consumers in those markets were unable to understand or utilise the service or product due to the complex nature of the design. Even though, in those instances, the product was designed to fill a void in the community or to enrich the lives of the community,

the lack of awareness and knowledge on how the product would benefit them as well as how to utilise the product or service led to the failure of the product in the market.

6.3. Research Proposition 2: Availability

M-commerce services are dependent on the availability of infrastructure to support the service. Infrastructure may include the strength of a signal, the amount of data required for the application or the type of cellular phone required to access the service.

Proposition 2a: Availability of the m-commerce will lead to the adoption of the service.

6.3.1 Discussion of findings on Proposition 2

Low-income consumers are generally faced with the challenge of access and availability to services and products (Anderson & Billou, 2007). The lack of basic infrastructure such as electricity, water and roads makes it difficult for business to make products and services available to the low-income market (SadreGhazi, 2008).

The availability section of the questionnaire consisted of three questions (see Appendix A – Questionnaire, Section 3) relating to the availability of service and infrastructure to support cellular communication and m-commerce in those areas.

The correlation analysis indicates a weak positive relationship between availability of m-commerce services and its adoption. This indicates that the availability of the

service is not a significant predictor of m-commerce adoption in low-income markets.

The regression analysis established a p-value of 0.856. This indicates that the availability of m-commerce services is not a predictor of adoption. This finding does not support the literature and arguments by Anderson and Billou (2007) and SadreGhazi (2008) in that the availability of infrastructure and services in low-income markets is not critically important to the success of adoption.

The evidence indicating that the availability of services is not a key attribute of adoption for m-commerce could be attributed to a number of factors. The reliability of the statements in testing for availability was below the recommended 0.5 at 0.222. Omitting certain statements to improve the reliability did not have any impact on the regression and correlation analysis (see Appendix D: Regression and Correlation Analysis on improved Cronbach's Alpha), which could be an indication that the statements did not substantially test the construct.

The unavailability of services at the low-income market leaves it open to exploitations by small-scale entrepreneurs (Prahalad & Hammond, 2002). This could create a level of acceptance amongst the market, that services and products that they receive will be gladly accepted even at a higher price, as opposed to becoming influenced by the unavailability of the service. This supports the finding that awareness and knowledge of the service is important to this market. As mobile services are free roaming and generally accessible at any place, consumers that are aware and knowledgeable on how to use the product or service may adopt it.

Companies such as Smart Communication utilised viral marketing campaigns to overcome the challenges of infrastructure availability (SadreGhazi, 2008). They recognised that in order to overcome the challenges in creating an effective distribution network with limited infrastructure, they would have to create an awareness campaign that supported their informal distribution. This further supports the fact that the awareness of the products and services are extremely important in getting product and service adoption.

6.4. Research Proposition 3: Convenience

A user will adopt the m-commerce service if it provides benefit to him or her. The ubiquitous nature of m-commerce in providing convenience to the consumer enables access to the service at any place and any time.

Proposition 3a: The convenience provided by m-commerce will lead to the adoption of the service.

6.4.1 Discussion of findings on Proposition 3

Convenience allows m-commerce to create value by enabling products and services to be available from any place and at any time (Clarke III, 2008). The fundamental differentiator of m-commerce is its ubiquitous nature that enables it to provide convenience to consumers (Balasubramanian *et al*, 2002).

The convenience section of the questionnaire consisted of four statements (see Appendix A – Questionnaire, Section 4) relating to the convenience factors and ubiquitous nature of m-commerce. The statements identified had a reliability measure 0.535 according to the Cronbach's alpha analysis.

The correlation analysis points toward a weak positive relationship between convenience of m-commerce services and its adoption. This indicates that the convenience of the service is not a significant predictor of m-commerce adoption in low-income markets.

The regression analysis established a p-value of 0.930. This indicates that the convenience of m-commerce services is not a predictor of adoption. This finding does not support the literature review and arguments by Balasubramanian *et al* (2002), Clarke III (2008) and Khalifa and Ning Shen (2008), in that the convenience factor is a critical aspect to the success of m-commerce adoption.

There are various reasons why the results do not support the literature. Consumers could possibly view the ubiquitous nature of m-commerce as an attribute and not distinguish it as a contributing aspect of adopting the service or product.

Coursaris and Hassanein (2002) perceived m-commerce as the natural extension of e-business with the additional value add of convenience. Clarke III (2008) added to this view that wireless devices will add to the agility and accessibility that was provided by e-commerce. In understanding the actual fabric of the low-income market and the impact of the digital divide on them, it may be understandable that the convenience associated with extending e-commerce to a mobile platform may not lead to adoption in this market.

Access to information and communication technologies by low-income markets is difficult. In general the rollout of Internet access in South Africa is sparse and expensive and this creates disparity between those that can afford to access it and

those that cannot. This has led to low levels of ICT awareness amongst low-income consumers. In accordance with Clarke III (2008), users of e-commerce will find benefit and convenience in m-commerce as they obtain ubiquity through m-commerce. This is not the same for the low-income market that does not utilise e-commerce and will thus not obtain the benefit of having similar services on a mobile platform.

The distinguishing factor for this market will be introducing mobile commerce as a new product or service. This will include a complete awareness and change management campaign. Awareness and knowledge will thus introduce the attribute of convenience that mobile commerce will bring to the market.

6.5. Research Proposition 4: Affordability

The low-income markets are highly price sensitive. The cost of the product does not have to be cheap if it offsets other costs such as transport.

Proposition 4a: Cost effectiveness of m-commerce will lead to the adoption of the service.

6.5.1 Discussion of findings on Proposition 4

One of the most discerning characteristics of low-income markets is their low level of disposable income (Prahalad & Hammond, 2002). SadreGhazi (2008) identified two ways in which this problem manifests itself: (1) low purchasing power and (2) the lack of access to credit. Banks are reluctant to extend credit to these consumers due to their generally fluctuating or ad hoc income as opposed to a steady monthly income.

Affordability in low-income markets is the ability of a firm to deliver goods and services at a price point that is aligned with the payment capabilities of the consumer (Anderson and Billou, 2007). Affordability of the products and the entrance price point is seen to be a driver for adoption of m-commerce services.

The affordability section of the questionnaire consisted of four statements (see Appendix A – Questionnaire, Section 5) relating to the affordability factors of m-commerce adoption.

The correlation analysis indicates a weak positive relationship between affordability of m-commerce services and its adoption. This indicates that the affordability of the service is not a predictor of m-commerce adoption in low-income markets.

The regression analysis established a p-value of 0.558. This further indicates that the affordability of m-commerce products and services is not a predictor of adoption. This finding does not support the literature review and arguments by Anderson and Billou (2007) and SadreGhazi (2008) in that the affordability factor of m-commerce will lead to adoption.

The evidence indicating that the affordability of services is not a predictor of adoption for m-commerce services and products could be attributed to a number of factors. The reliability of the statements in testing for availability was below the recommended 0.5 at 0.299. Omitting certain statements to improve the reliability did not have any impact on the regression and correlation analysis (see Appendix D: Regression and Correlation Analysis on improved Cronbach's Alpha), which could be an indication that the statements did not substantially test the construct.

Low-income consumers generally have a small percentage of disposable income, most of which is utilised for food and shelter (Prahalad & Hammond, 2002). The acceptance that access to a higher end lifestyle such as formal housing is not probable leads to consumers enhancing their lives within the current environment (Prahalad & Hammond, 2002). This could possibly be a reason as to why costs or affordability did not predict adoption within the low-income market analysed. The respondents could adopt the view that any service that enhances their lifestyle and provided additional value is worth saving for.

Smart Communication in the Philippines discovered that reducing the recharge amount on a prepaid card would enable the low-income market to afford mobile communication (Anderson & Billou, 2007). Similar trends have been followed in South Africa over the last few years with mobile companies such as Vodacom reducing their prepaid recharge limits from an initial R15 during inception to R2 at the beginning of 2010. This decrease has made mobile communication affordable to most low-income consumers.

The adoption of services in section 6.1 indicates a 90% adoption of “sms” and “please calls me” services. Both these services are cost effective ways of communicating utilising a cellular phone. “Sms’” costs from as little as 25 cents and the “please call me” service is free. The cost effectiveness of mobile services extends beyond that in terms of certain service providers in South Africa. Cell C for example enables free calls between Cell C users over weekends. These products are designed to attract the low-income consumer and thus make mobile communication cost effective. This could be another possible reason why the

results indicate that costs were not a significant predictor of m-commerce service adoption.

6.6. Research Proposition 5: Acceptability

Products and services successful adoption is dependent on the level of acceptance they gain. Acceptability is achieved when a product or service fulfils a need in the community and is widely adopted.

Proposition 5a: Acceptability of m-commerce will lead to the adoption of the service.

6.6.1 Discussion of findings on Proposition 5

Anderson and Billou (2007) illustrated acceptability by the level at which consumers are willing to accept, consume, distribute or sell a product or service. The products or services have to be adapted to the specific needs and requirements of the target market that it serves to penetrate (Simanis, 2009). Simanis (2009) highlighted the need for community involvement in gaining acceptance of a product or service. The value in gaining acceptance of a product or service within the low-income market is high.

The acceptability section of the questionnaire consisted of three statements (see Appendix A – Questionnaire, Section 6), which was related to the acceptability levels of m-commerce services. The statements identified had a significant reliability measure of 0.664 according to the Cronbach's alpha analysis.

The correlation analysis indicates a strong positive relationship between acceptability of m-commerce services and its adoption. This indicates that in order

to effect higher levels of m-commerce adoption in low-income markets, a significant effort has to be made to gain acceptance of these services. This confirms the notion by Simanis (2009) that acceptance of a product or service is essential for its adoption.

The regression analysis confirmed similar findings where the p-value achieved was less than 0.05, reported to be 0.022. This indicates that the acceptability criteria of m-commerce predicts adoption of the service at a 95% level of significance. This implies that the proposition that acceptability of m-commerce services will lead to the adoption supports the literature.

Nohria and Leestma (2001) further supports the findings in that business needs to develop m-commerce service based on user requirements and not on fulfilling business objectives solely. The perceived value obtained by the customer based on customer perception of what they are receiving will directly influence their decision to adopt or reject the product or service (Ishmatova & Obi, 2009).

The acceptability aspect of adoption is closely related to the level of awareness and knowledge of the m-commerce service. Having knowledge that a service exists, knowing how to use the service and the ease of using the service are critical components that will enable acceptance. Another aspect of acquiring knowledge and awareness is through association with other people that use the service. This aspect of acceptability was tested through the questionnaire and supports the requirement for knowledge and awareness to accept an m-commerce service.

7: Conclusion

7.1. Introduction

The purpose of this study was to explore aspects, which would provide insights for mobile commerce adoption in low-income markets. A framework was developed that integrated identified aspects of adoption. A framework derived from the literature was tested. The framework consisted of five distinct variables: awareness, availability, convenience, affordability and acceptability.

This chapter looks at the main findings and conclusions that can be derived with respect to the m-commerce adoption framework in low-income markets based on the findings pertaining to the propositions. Recommendations will also be made based on the findings. Finally, this chapter will present some proposals for future research.

7.2. Main findings and conclusion

M-commerce is viewed as one of the most penetrating technologies of its time (Balasubramanian *et al*, 2002; Moore & Chipp, 2005). The adoption of the m-commerce in the low-income market over the last few years has been noteworthy. The adoption rate of the 11 tested m-commerce services was above 50%. This supports the view of Prahalad and Hammond (2002), that there is potential in the low-income market as consumers in these markets have the ability to consume beyond the bare necessities of food and shelter. Prahalad and Hammond (2002) holds the view that consumers in these markets strive to change their quality of life by acquiring what is within their reach.

The research was designed to test the framework for m-commerce adoption in low-income markets. The low-income market was classified as the foundation tier of the economic pyramid in South Africa represented by LSM's 1-4. From the findings of the research study, the main conclusion is that not all the constructs are applicable to the low-income consumer market for m-commerce.

The most significant aspect of the results was that a strong level of awareness of the service was positively associated with the adoption of the product or service. This had to be further supported by their knowledge of how to use and the ease of use of the service. Consumers in the low-income market have lower levels of literacy and skills and their access to ICT technologies are limited. M-commerce is the natural extension of e-commerce and would therefore require a certain level of experience to utilise the m-commerce service. The development of m-commerce services for the low-income market has to therefore be coupled with exceptional awareness and change management campaigns that will enable users in the low-income market to effectively adopt the service.

The availability of infrastructure as well as the affordability and convenience criteria to support the mobile commerce service did not confirm the literature as an explanation for the adoption of m-commerce service in the low-income market.

Acceptability was another key component of adoption and was an affirmation of SadreGhazi (2008) studies where the impact of community involvement in both the development and promotion of a product or service will lead to a higher level of acceptability.

In general, many businesses are encouraged by the expansion and adoption of mobile technologies across all sectors of South Africa. The growth of this market has led to the need for critical understanding and the development of m-commerce business models. Further investigation into the development of the framework proposed will potentially contribute to the creation of a widely accepted model.

7.3. Recommendations

These recommendations are based on the finding of this research and are mainly directed to business and government. Government will need to acknowledge mobile technologies as a medium that is readily available and will enable service delivery to its constituents. The potential market in South Africa in terms of low-income consumers must not be underestimated.

The infrastructure and capabilities available to the low-income market need to be explored. The low-end mobile phones have limited capabilities in terms of Internet browsing and 3G capabilities, as well as the availability of wireless broadband across the country. These are critical facets that have to be considered when developing m-commerce services for the low-income market.

A clear understanding of the community requirements needs to be established. This has to be done in conjunction with the community and not from a business or government view of what the market requires. The products and services that are being developed should have input from the community that will be using it. A critical component is to recognize the level of skills and literacy of the low-income market. The m-commerce service needs to be simple to use and training or educating consumers on using the service has to be easily understood.

Marketing and awareness campaigns that support the m-commerce service should have community integration embedded in them. Road shows and local support for the service at local outlets are necessary to create awareness and acceptance. The potential savings in terms of transport expenses and time need to be highlighted.

The South African government has tried to bridge the digital divide over the last few years by creating internet access points in various community centers and libraries. Departments such as the South African Revenue Services have utilised ICT to enable more effective service delivery. The concept of mobile government has also been adopted and government departments are utilising mobile communications to add value to service delivery. Government needs to ensure that the services developed correspond to the real needs of people and to involve communities in developing these services.

7.4. Future Research Recommendations

With respect for future work in developing a model for m-commerce adoption in low-income markets, several avenues could be explored:

Causal research should be conducted on m-commerce services developed for low-income markets. The study should be conducted at various locations to test the impact and inter-relationship of certain variables tested. These variables should include:

- Community involvement in developing the service.
- Various awareness and marketing campaigns.

- Costs of service.

Researchers should design valid and reliable instruments for measuring the degree to which each of the constructs impacts on m-commerce adoption. These instruments should be pretested and evaluated on a consistency scale.

The study should be more inclusive and the sample should cover various types of communities. The sampling method adopted should ideally be probability sampling, as this will allow the finding to be generalised to the population.

The framework should be adapted to test the convenience, availability and affordability constructs only after initial awareness and change management has been done on an m-commerce service.

The current study did not adequately assess what other factors could hinder the adoption of m-commerce services other than the ones explored. For example the question of trust is extremely pertinent to adoption of certain services - such as banking services. The research could thus further be extended into factors determining adoption based on service categories.

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9: Appendices

9.1. Appendix A – Questionnaire

ADAPTATION OF THE M-COMMERCE VALUE PROPOSITION FOR LOW-INCOME MARKETS

UNIVERSITY OF PRETORIA

GORDON INSTITUE OF BUSINESS SCIENCE

BACKGROUND INFORMATION DOCUMENT

AND INFORMED CONSENT FORM

My name is Mohamed Mahomed and I am currently studying for a Master of Business Administration (MBA) degree at the Gordon Institute of Business Science with the University of Pretoria. I need to complete a research project as a partial requirement for the degree, and I have chosen to look at mobile technology adoption in lower income areas in South Africa. Mobile commerce is the use of any mobile devices such as cellular phones as a business tool. Questions will relate to the following mobile services:

- Sms notifications of promotions and advertising and competitions.

- Banking services such as receiving sms notifications to withdraw money from an ATM. The recipient does not need a bank account to access this service.
- Downloading ringtones and pictures.

The following questionnaire will be used to test the adoption of this service in terms of a framework for low-income consumers.

I would appreciate your participation in this study. It should take you no longer than 10 minutes to complete the questions. There are no costs to you. I undertake to keep all information received strictly confidential. Kindly answer the following questions.

By completing the survey, you indicate that you voluntarily participated in this research. However, if you so wish you can withdraw at any time. If you have any concerns, you can contact me on 082 373 7863 or my supervisor, Dr. Clive Corder on 082 655 6740 or cliveco@icon.co.za.

Thank you for taking time to complete this questionnaire.

Yours sincerely

Mohamed Mahomed

SECTION 1: CHARACTERISTICS

*Please tick **one** appropriate answer in the nominated **box** for each of the following questions.*

1. I am going to read out a list of questions to you. These might sound strange, but we ask them in order to understand more about the lifestyles of different groups of people. Please tell me, which of the following do you have in your home? Do you have…?

	Yes	No
Hot Running Water		
Personal Computer/ Laptop or Desktop		
Motor Vehicle		
Vacuum Cleaner or floor polisher		
Electric Stove		
Microwave Oven		
Flush Toilet Inside or Outside		

2. Do you own a cellular phone?

Yes		No	

3. What is your gender?

Female		Male	

4. What is your age group?

16 - 24 years	
25 - 34 years	
35 – 49 years	
50 years and over	

5. I am now going to read out a list of cellphone activities. Please tell me which of the following you use.

	Yes	No
Play games on the phone		
Enter competitions		
Send SMS's		
Use chat services (e.g MXit)		
Send "Please call me		
Send an MMS		
Download ringtones or logo's		
Browse the internet		
Download or listen to music – excluding the radio		
Take photo's		
Take a video recording		

SECTION 2: AWARENESS AND KNOWLEDGE

I am now going to read statements that relate to your awareness and knowledge of mobile services. Please select a response in respect of the following statements. The ratings follow the following scale:

Disagree = 1	Neutral = 2	Somewhat Agree = 3	Agree = 4	Strongly Agree = 5

	1	2	3	4	5
Awareness					
You are familiar with sms notifications for promotions and discounts.					
You are familiar with sms competitions.					
You are familiar with sms banking services.					
Knowledge					
You have the knowledge and skills required to use mobile devices.					
SMS and other mobile services are easy to use.					
You will use a mobile service if you are familiar with it.					

SECTION 3: AVAILABILITY

I am now going to read statements that relate to the availability of mobile services to you. Please indicate a yes or no answer.

	Yes	No
Does your cellular phone have an sms facility?		
Does this area have a strong cellular signal?		
Is power readily available to charge your phone?		

SECTION 4: CONVENIENCE

I am now going to read statements that relate to the convenience of mobile services. Please select a response in respect of the following statements. The ratings follow the following scale:

Disagree = 1	Neutral = 2	Somewhat Agree = 3	Agree = 4	Strongly Agree = 5

	1	2	3	4	5
Convenience is important for you to use a service or product.					
Using mobile services saves time.					
Mobile services allows you access from any place.					
Mobile services allows you access at any time.					

SECTION 5: AFFORDABILITY

I am now going to read statements that relate to the affordability of mobile services. Please select a response in respect of the following statements. The ratings follow the following scale:

Disagree = 1	Neutral = 2	Somewhat Agree = 3	Agree = 4	Strongly Agree = 5

	1	2	3	4	5
The costs for using mobile services are clear and understandable.					
Costs will determine your use of mobile services.					
Do you use your airtime for mobile services apart from making calls.					
Do you believe that using airtime on mobile services is a benefit.					

SECTION 6: ACCEPTABILITY

I am now going to read statements that relate to the acceptability of mobile services. Please select a response in respect of the following statements. The ratings follow the following scale:

Disagree = 1	Neutral = 2	Somewhat Agree = 3	Agree = 4	Strongly Agree = 5

	1	2	3	4	5
Mobile services are acceptable to you if people you know are using it.					
Do you find mobile services suitable for you.					

Do you prefer mobile service when you have time					

SECTION 7: PRIORITISING THE CONSTRUCTS

I would now like you to rate the following in terms of importance for you to use mobile services:

	Not Important	Important	Vey Important
Awareness and Knowledge			
Availability			
Convenience			
Affordability			
Acceptability			

Can you please provide the following information?

First Name:_____

Cellular Phone Number:

Thank you for taking the time to complete the questionnaire.

Interviewer Name:_____

9.2. Appendix B: Data Analysis - Adoption of M-commerce

9.2.1 Play games on the phone

Play Games on The Phone

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	30	28.8	28.8	28.8
	yes	74	71.2	71.2	100.0
	Total	104	100.0	100.0	

Table 9-1: M-commerce adoption - Play games on the phone

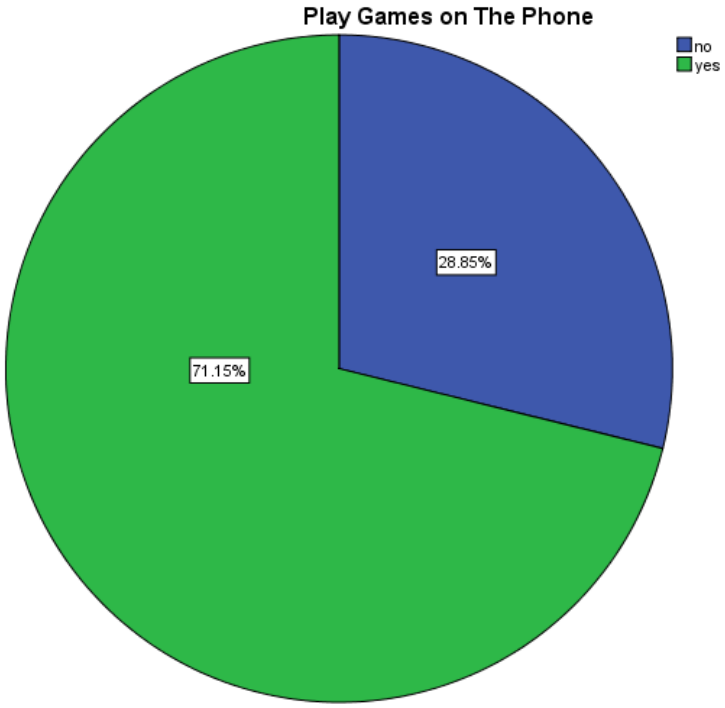

Figure 9-1: M-commerce adoption – Play games on the phone

9.2.2 Enter Competitions

Enter Competitions

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	57	54.8	54.8	54.8
	yes	47	45.2	45.2	100.0
	Total	104	100.0	100.0	

Table 9-2: M-commerce adoption – Enter competitions

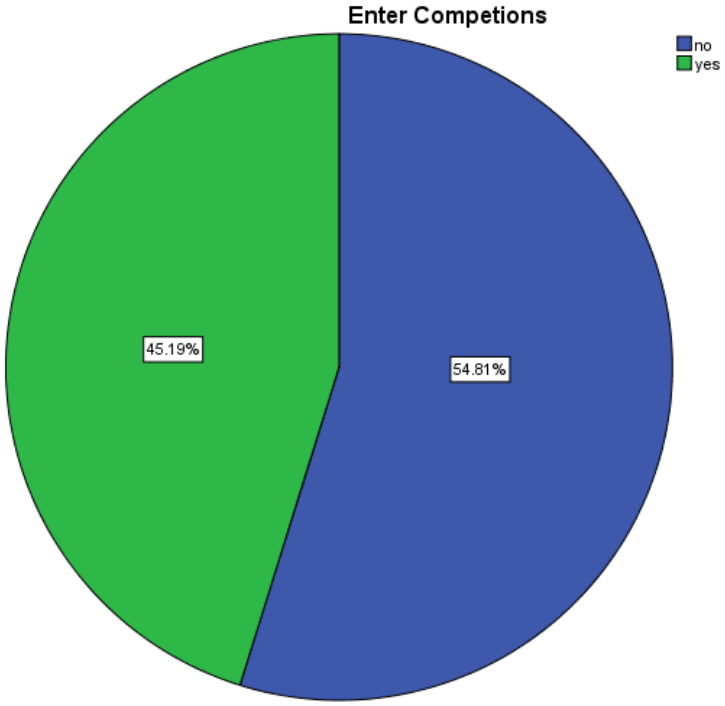

Figure 9-2: M-commerce adoption – Enter competitions

9.2.3 Send SMS's

Send SMS's

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	10	9.6	9.6	9.6
	yes	94	90.4	90.4	100.0
	Total	104	100.0	100.0	

Table 9-3: M-commerce adoption – Send SMS's

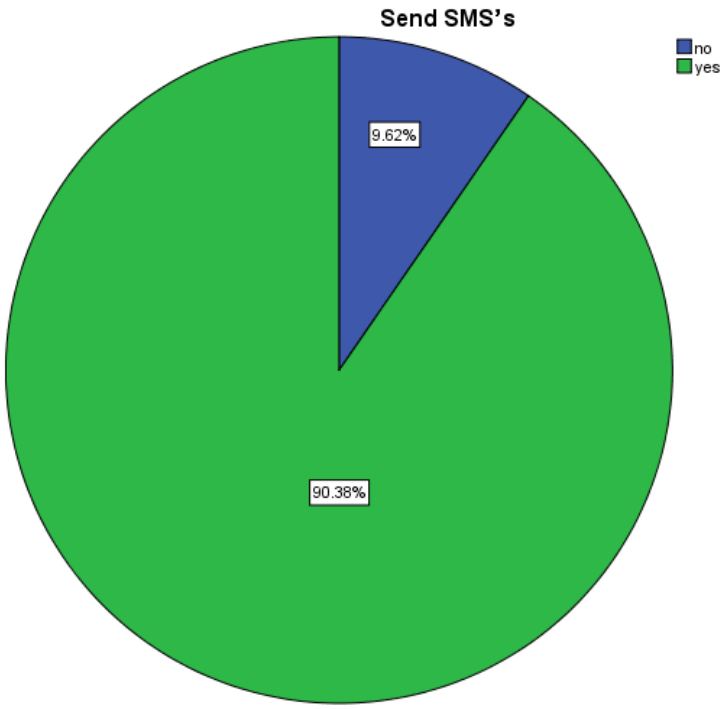

Figure 9-3: M-commerce adoption – Send SMS's

9.2.4 Use Chat Services

Use Chat Services

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	81	77.9	77.9	77.9
	yes	23	22.1	22.1	100.0
	Total	104	100.0	100.0	

Table 9-4: M-commerce adoption – Use chat services

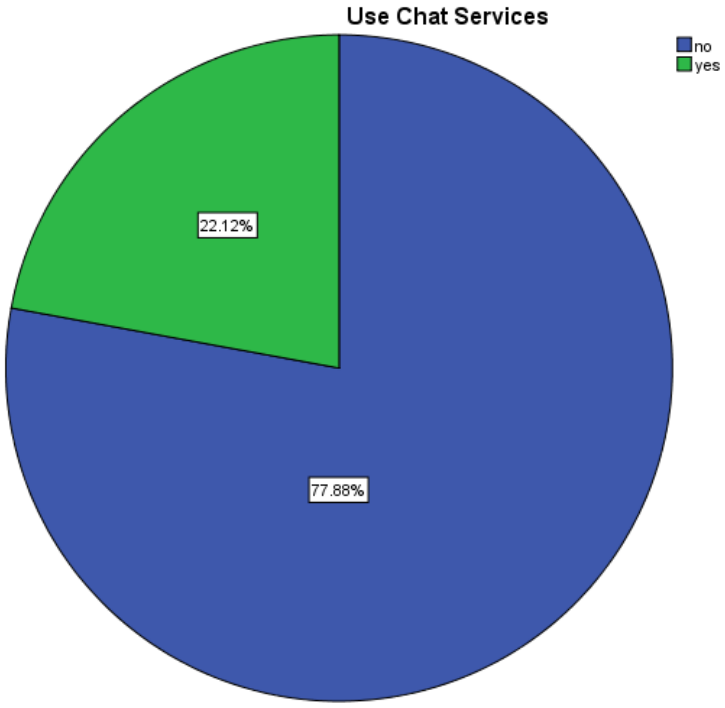

Figure 9-4: M-commerce adoption – Use chat services

9.2.5 Send please call me

Send Please call me

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	9	8.7	8.7	8.7
	yes	95	91.3	91.3	100.0
	Total	104	100.0	100.0	

Table 9-5: M-commerce adoption – Send please call me

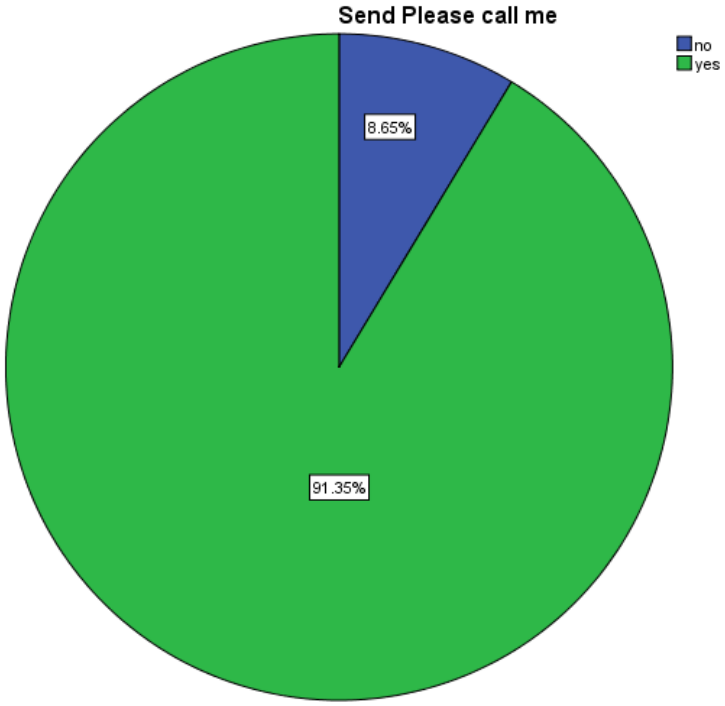

Figure 9-5: M-commerce adoption – Send please call me

9.2.6 Send an MMS

Send an MMS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	59	56.7	56.7	56.7
	yes	45	43.3	43.3	100.0
	Total	104	100.0	100.0	

Table 9-6: M-commerce adoption – Send MMS

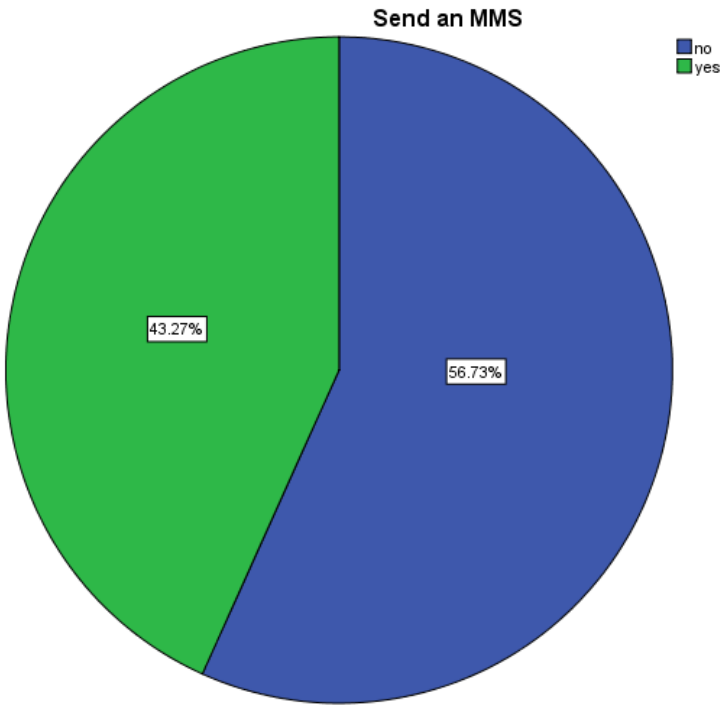

Figure 9-6 Send MMS

9.2.7 Download Ringtones

Download Ringtones

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	67	64.4	64.4	64.4
	yes	37	35.6	35.6	100.0
	Total	104	100.0	100.0	

Table 9-7: M-commerce adoption –Download ringtones

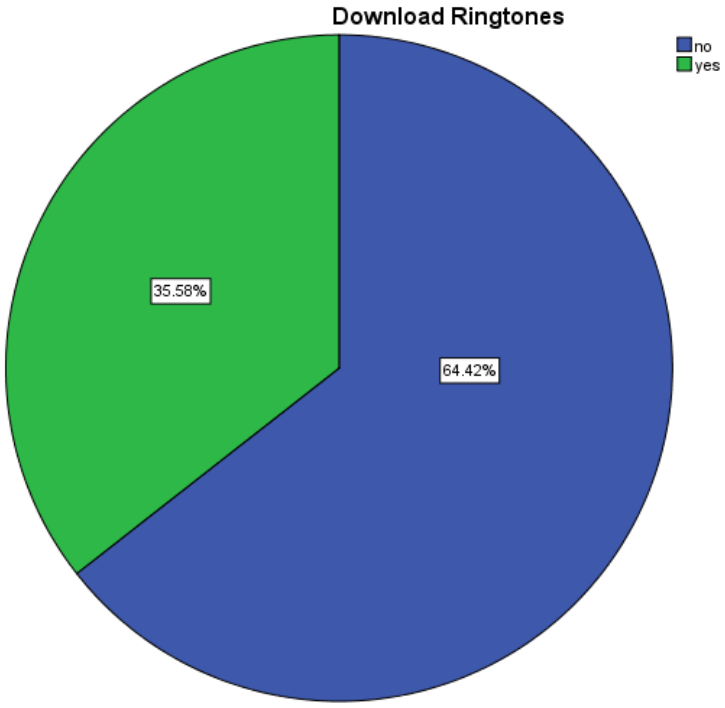

Figure 9-7: M-commerce adoption – Download ringtones

9.2.8 Browse the internet

Browse the internet

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	75	72.1	72.1	72.1
	yes	29	27.9	27.9	100.0
	Total	104	100.0	100.0	

Table 9-8: M-commerce adoption – Browse the internet

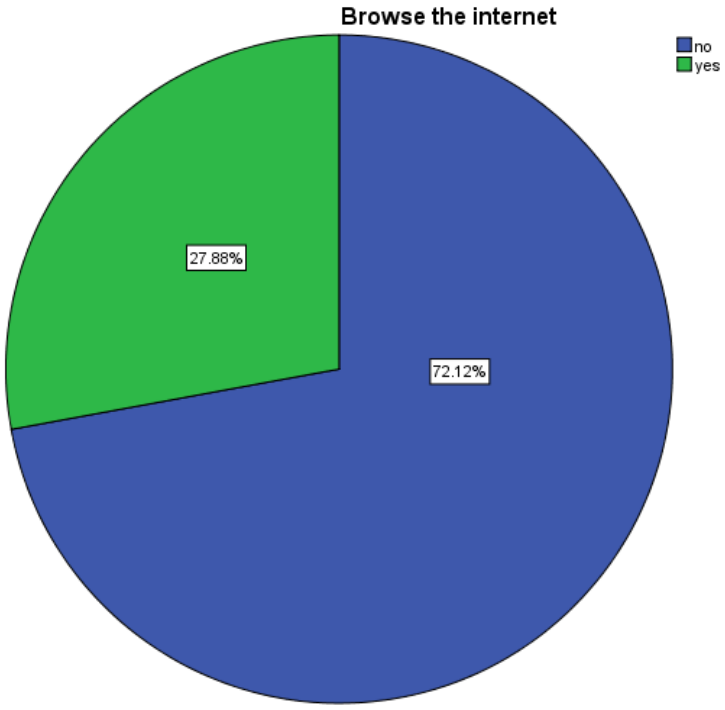

Figure 9-8: M-commerce adoption – Browse the internet

9.2.9 Download or listen to music

Download or listen to Music

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	36	34.6	34.6	34.6
	yes	68	65.4	65.4	100.0
	Total	104	100.0	100.0	

Table 9-9: M-commerce adoption – Download or listen to music

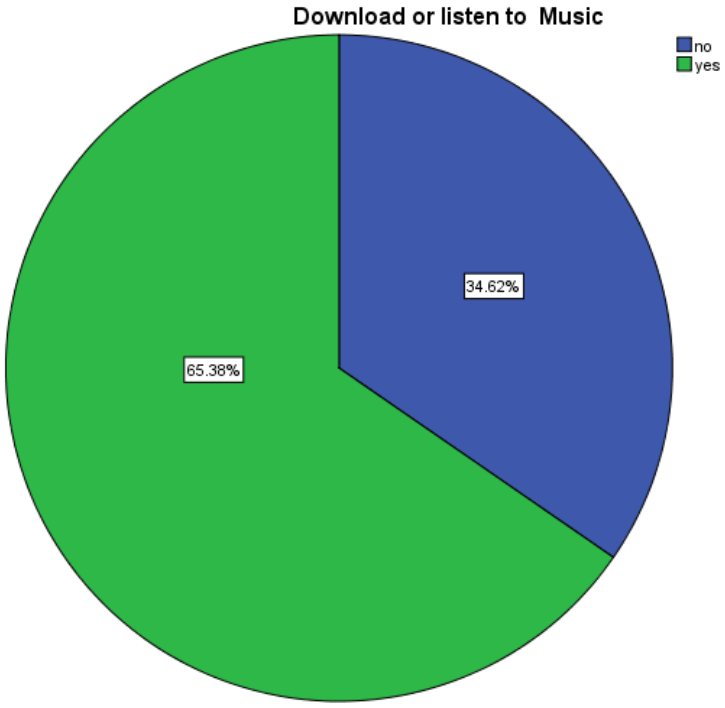

Figure 9-9: M-commerce adoption – Download or listen to music

9.2.10 Take Photos

Take Photos

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	35	33.7	33.7	33.7
	yes	69	66.3	66.3	100.0
	Total	104	100.0	100.0	

Table 9-10: M-commerce adoption – Take photos

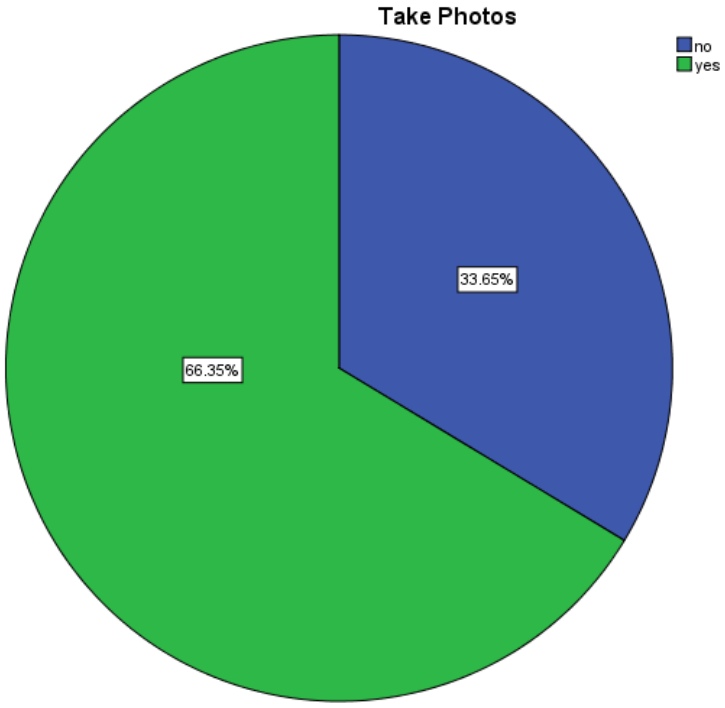

Figure 9-10: M-commerce adoption – Take photos

9.2.11 Take a video recording

Take a video recording

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	no	37	35.6	35.6	35.6
	yes	67	64.4	64.4	100.0
	Total	104	100.0	100.0	

Table 9-11: M-commerce adoption – Take a video recording

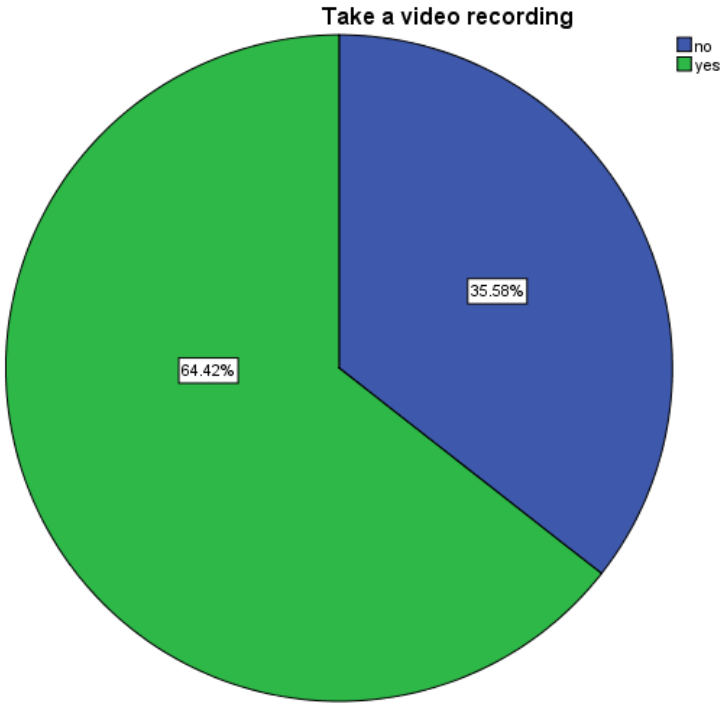

Figure 9-11: M-commerce adoption – Take a video recording

9.3. Appendix C: Scale Reliability Analysis

9.3.1 Scale: Awareness Reliability

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Familiar with SMS Notifications and Promotions.	6.19	5.069	.336	.394
Familiar with SMS Competitions.	5.79	5.489	.290	.467
Familiar with SMS Banking.	5.90	4.612	.354	.362

Table 9-12: Scale - Awareness Reliability

9.3.2 Scale: Knowledge Reliability

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SMS and Other Mobile Services to Use.	6.55	4.405	.462	.584
Knowledge and Skills Required.	7.09	3.381	.495	.523
You will use a mobile service if familiar.	7.04	3.455	.466	.568

Table 9-13: Scale - Knowledge Reliability

9.3.3 Scale: Availability Reliability

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Does your cell phone have an SMS facility?	.88	.588	-.011	.359
Does this area have a strong cellular signal?	1.25	.306	.219	-.138[a]
Is power readily available to charge your phone?	1.42	.363	.146	.087

Table 9-14: Scale - Availability Reliability

9.3.4 Scale: Convenience Reliability

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Convenience is important for you to use a service.	15.30	5.738	.249	.525
Using mobile services saves time.	14.56	5.655	.493	.364
Mobile services allows you access at any time.	14.48	6.767	.441	.438
Mobile services allows you access from any place.	14.75	6.746	.220	.524
Do you find the mobile services useful.	14.95	6.126	.219	.531

Table 9-15: Scale - Convenience Reliability

9.3.5 Scale: Affordability Reliability

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
The costs of use are clear and understandable.	9.67	5.834	.079	.322
Costs will determine your use of mobile services.	9.62	5.715	.161	.240
Do you use airtime for mobile services other than calls.	9.74	4.369	.284	.061
Do you believe that using airtime on mobile services is a benefit.	10.61	4.707	.109	.316

Table 9-16: Scale - Affordability Reliability

9.3.6 Scale: Acceptability Reliability

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Mobile services are acceptable to you if someone you know is using it.	7.37	3.208	.470	.580
Do you find mobile services suitable for you.	7.33	3.601	.470	.575
Do you prefer mobile service when you have time	6.93	3.559	.489	.550

Table 9-17: Scale - Acceptability Reliability

9.4. Appendix D: Regression and Correlation Analysis on improved Cronbach's Alpha

Correlations

		Adoption	Acceptability	Awareness	Knowledge
Pearson Correlation	Adoption	1.000	.379	.364	.511
	Acceptability	.379	1.000	.344	.304
	Awareness	.364	.344	1.000	.337
	Knowledge	.511	.304	.337	1.000
	Convenience	.236	.300	.205	.391
	Availability	.117	.263	.203	.131
	Affordability	.194	.410	.376	.242

Table 9-18: Correlation Analysis Part 1

Correlations

		Convenience	Availability	Affordability
Pearson Correlation	Adoption	.236	.117	.194
	Acceptability	.300	.263	.410
	Awareness	.205	.203	.376
	Knowledge	.391	.131	.242
	Convenience	1.000	.180	.237
	Availability	.180	1.000	.239
	Affordability	.237	.239	1.000

Table 9-19: Correlation Analysis Part 2

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	P-value.
		B	Std. Error	Beta		
1	(Constant)	-1.438	1.642		-.876	.383
	Acceptability	.250	.107	.226	2.328	.022
	Awareness	.164	.088	.176	1.861	.066
	Knowledge	.423	.100	.402	4.235	.000
	Convenience	-.009	.106	-.008	-.089	.930
	Availability	-.059	.324	-.016	-.182	.856
	Affordability	-.066	.112	-.056	-.588	.558

a. Dependent Variable: Adoption

Table 9-20: Regression Analysis

9.5. Appendix E: Prioritising the Constructs

Awareness and Knowledge

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	54	51.9	51.9	51.9
	Not Important	5	4.8	4.8	56.7
	Very Important	45	43.3	43.3	100.0
	Total	104	100.0	100.0	

Table 9-21: Prioritising the constructs - Awareness and Knowledge

Availability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	72	69.2	69.2	69.2
	Not Important	6	5.8	5.8	75.0
	Very Important	26	25.0	25.0	100.0
	Total	104	100.0	100.0	

Table 9-22: Prioritising the constructs – Availability

Convenience

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	62	59.6	59.6	59.6
	Not Important	22	21.2	21.2	80.8
	Very Important	20	19.2	19.2	100.0
	Total	104	100.0	100.0	

Table 9-23: Prioritising the constructs – Convenience

Affordability

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	60	57.7	57.7	57.7
	Not Important	8	7.7	7.7	65.4
	Very Important	36	34.6	34.6	100.0
	Total	104	100.0	100.0	

Table 9-24: Prioritising the constructs - Affordability

Accessibility

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Important	61	58.7	58.7	58.7
	Not Important	26	25.0	25.0	83.7
	Very Important	17	16.3	16.3	100.0
	Total	104	100.0	100.0	

Table 9-25: Prioritising the constructs – Accessibility