

To investigate how Mobile Cellular Network Operators can increase the average revenue per user by stimulating the usage of broadband services.

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Potsane Malebanye (Pr Eng.) (70506817)

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Study Leader: Mr Andre Erwee

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Abstract

The objective of this research is to investigate how mobile cellular network operators can increase the average revenue per user by stimulating the usage of mobile broadband services. There is a general consensus that the revenue from voice calls is slowly reaching saturation; hence, mobile cellular operators, service providers and content providers are looking for other sources of revenue from their new and existing customers. They are therefore beginning to focus more intensively on customer retention and on developing new strategies that will stimulate the usage of high speed mobile data services.

The research shows that most people are aware of many of the mobile data services offered by operators, but that they thought that they were unreliable, slow, difficult to use and expensive. By and large, people signed up for mobile data services because they wanted a mobile always-on connection anytime, anywhere, with faster speed when accessing e-mail and other services or when downloading data from the Internet. The majority of people would use mobile broadband internet service if it cost less to use; if the speed were faster and the service were easy to use; if the cellular phone had a larger screen and used less battery power; and if the keyboard were larger.

The relationship between Network operators, WASPs and content providers was found to be good, even though at times it is strained by the increased competition between them; this forces them not to cooperate on some issues for fear of compromising their competitive advantage.

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1 Chapter: 1 Orientation

1.1 Introduction

The South African communications industry has three mobile cellular network operators, namely Vodacom (Pty) Ltd, MTN and Cell-C.

Vodacom (Pty) Ltd was established in 1993 and is one hundred percent owned by the Vodacom Group (Pty) Ltd, which is owned by Telkom SA, fifty percent, and Vodafone PLC, fifty percent. It launched services in 1994 and is presently the largest mobile cellular network operator in South Africa.

MTN was also established in 1993, and is one hundred percent owned by the holding company, MTN Group, which is listed on the Johannesburg Stock Exchange. The Group is owned by Newshel 664, holding nineteen percent; NEC, holding nine percent; and “other shareholders,” retaining seventy two percent (Falconer & Neilson, 2007: 85). It launched services in 1994 and is presently Africa’s largest mobile cellular network operator.

Cell-C, which was established in 2001, is a wholly owned subsidiary of 3C Telecommunications. It is sixty percent owned by Saudi’s Oger Telecom South Africa; twenty-five percent is held by CellSaf – a broad based consortium of black empowerment groups – and fifteen percent by Lanun Securities, the offshore investment arm of Saudi engineering group, Rashid. It launched services in 2001 (Falconer & Neilson, 2007: 88). It initially provided services via a 15-year commercially negotiated roaming agreement with Vodacom, as it rolled out a network of base-stations with the intention of relying solely on its own access network in metropolitan areas by the end of 2004 (The Yankee Group Report, 2003: 124).

The industry has been liberalised and is regulated by the Independent Communications Authority of South Africa (ICASA), mainly through the

Electronics and Communications Act, 2005 (Act No. 36 of 2005), whilst the Competition Act, 1998 (Act No. 89 of 1998) and the Constitution are also sometimes used to resolve disputes as they arise.

The South African mobile market reached an estimated 30.4 million by the end of 2005, making it one of the largest on the African continent, and is expected to grow to over 34 million by the end of 2006, reaching 43 million by 2010 (BMI-T, 2006: 400). Ninety-five percent of this market is predominantly prepaid, with low Average Revenue per User (ARPU) subscribers.

Worldwide, the communications industry is witnessing a galvanizing convergence of mobile communications and the Internet, with broadband services and the formation of the Mobile Internet. People all over the globe are beginning to use mobile communications as part of their everyday lives. It has already become a way of life for communicating with others; for accessing the Internet and intranets; for leisure, economic entrepreneurial/business activities and education.

As 2006 drew to a close, the total number of mobile subscribers worldwide was rapidly approaching 2.5 billion. This vast number has been achieved in a breathtakingly short period and over the next five or six years it is expected that another two billion more will be added to this total. As this staggering growth continues, in mature markets voice services have become commoditised; prices are low, margins are tight and competition is fierce. The last two or three years have consequently seen network operators turning to non-voice mobile services in an attempt to differentiate themselves from competitors and to generate revenue growth in order to help combat declining voice ARPU (Portio Research Limited, 2006: 4).

South Africa is no exception; the three Mobile Cellular Operators, Cell-C, MTN and Vodacom, are also facing a number of challenges as a result of the decline in the average revenue per user from voice traffic. The competition for subscribers also places more pressure on them to differentiate their services and

to introduce innovative broadband data services to maintain their competitive advantage.

1.2 Purpose or Objective of this Research

To investigate how Mobile Cellular Network Operators can increase the average revenue per user by stimulating the usage of broadband services.

1.3 Statement of the Problem of this Research

There is a general consensus in South Africa and worldwide that the revenue from voice calls is slowly reaching saturation; hence mobile cellular operators, service providers and content providers are looking for other sources of revenue from their new and existing customers. They are therefore beginning to focus more on customer retention and developing new strategies that will stimulate the usage of broadband multimedia services (high speed mobile data services).

Issues related to the main problem which will be researched are:

- 1) Whether there is an unmet demand for high speed data services in South Africa.
- 2) Whether mobile data services are unreliable, slow, difficult to use and expensive.
- 3) Whether subscribers or potential subscribers are aware of the mobile data services offered by the Mobile Cellular Network Operators.
- 4) Whether the strategic partnership between Mobile Cellular Network Operators, Content Providers and Wireless Applications Service Providers is working to the benefit of all, and do they know and understand what the market wants?

For operators to succeed in the new data arena, they will need not only to adopt new business models but also to generate multiple sources of revenue through commercial transactions with third party content providers and, more importantly,

forge new relationships with customers and vendors alike. Each faces fundamental challenges if they are to continue generating shareholder value.

1.4 Definitions

Acceptability – the extent to which consumers and others in the value chain are willing to consume, distribute or sell a product or service (Anderson & Billou, 2007).

Affordability – the degree to which a firm's goods or services are affordable to most consumers (Anderson & Billou, 2007).

Availability – the extent to which customers are able to readily acquire and use a product or service (Anderson & Billou, 2007).

Awareness – the degree to which customers are aware of a product or service (Anderson & Billou, 2007).

Mobile Broadband Services – is the name used to describe the 3G services which are made possible by HSDPA and HSUPA, the latest technologies on the Wideband CDMA evolutionary path (Wikipedia, 2007).

Digital Video Broadcasting Handheld (DVB-H) – is a technical specification for bringing broadcast services to handheld receivers (Wikipedia, 2007).

Enhanced Data Rates for GSM Evolution (EDGE) – is a digital mobile phone technology that allows for an increase in data transmission rate and improved data transmission reliability (Wikipedia, 2007).

General Packet Radio Service (GPRS) – is a mobile data service available to users of GSM and AMPS mobile phones. GPRS data transfer is typically charged per megabyte of transferred data, while data communication via traditional circuit switching is billed per minute of connection time, independent of

whether the user has actually transferred data or has been in an idle state. GPRS can be used for services such as WAP access, SMS, MMS and for Internet communication services such as e-mail and World Wide Web access (Wikipedia, 2007).

High-Speed Downlink Packet Access (HSDPA) – is a third generation mobile telephone communications protocol in the High Speed Packet Access family, which allows networks based on the Universal Mobile Telecommunications System to have higher data transfer speeds and capacity. Current HSDPA deployments support down-link speeds of 1.8, 3.6, 7.2 and 14.4 Mbit/s (Wikipedia, 2007).

High Speed Uplink Packet Access (HSUPA) – is a 3G mobile telephony protocol in the HSPA family with up-link speeds of up to 5.76 Mbit/s (Wikipedia, 2007).

Third Generation (3G) – is the third generation of mobile phone standards and technology, after 2G. It is based on the International Telecommunication Union (ITU) family of standards under the International Mobile Telecommunications programme, "IMT-2000" (Wikipedia, 2007).

Walled Garden Approach – Operators direct consumers to content selected and categorized by the operator and are billed through the operator billing system (Marek, 2006).

Wireless Application Protocol (WAP) – Is an open international standard for applications that use wireless communication. Its principal application is to enable access to the Internet from a mobile phone or personal digital assistant (Wikipedia, 2007).

Worldwide Interoperability for Microwave Access (WiMAX) – is a telecommunications technology aimed at providing wireless data over long

distances in a variety of ways, from point to point links to full mobile cellular type access (Wikipedia, 2007).

1.5 Delimitation of the Study

Research shows that until recently mobile network operators have derived a huge percentage of their revenue from normal voice traffic based on airtime usage and SMS. As mobile cellular penetration reaches saturation, price competition intensifies in many developed and developing markets. As new entrants increase the competition for subscribers, cellular operators continue to experience increasing pressure on ARPU.

Mobile operators are therefore trying to find new ways of driving revenue. However, many of them are finding it difficult to achieve significant ARPU growth in their core businesses of mobile voice. They are now turning to broadband mobile data services for new sources of revenue that will offset the substantial decline in voice revenue. Yet, despite its business potential, consumer spending on mobile data services has been unable to match the decline in voice revenues.

The research only deals with the South African Mobile Cellular Network Operators, content providers and wireless application service providers, and not with the mobile industry as a whole. Thus the research focuses on how these operators can increase their average revenue per user by adopting some internationally proven strategies to stimulate the usage of mobile broadband data services in order to circumvent the declining voice ARPU.

Since the technology used to provide mobile broadband data services is still new and very dynamic, little has yet appeared on the subject in academic articles published in journals.

Since the data collection for this research was confined to Gauteng and most of it was done by e-mail – targeting students at technikons and universities – it might not be representative of the broader Gauteng or South African community.

A number of questions were not straightforward, and therefore could have confused some of the respondents.

1.6 Importance of the Study

The research will explore alternative strategies which could be used by South African Cellular Mobile Network Operators to stimulate the usage of broadband multimedia services to increase the average revenue per user (ARPU). These alternative strategies will be limited to addressing the needs of the consumers, the majority of whom fall in the medium and low income bracket group, use pre-paid and are black.

By addressing these needs, mobile operators will contribute to the upliftment of millions of South Africans who still live in conditions of squalor. They will also directly address the objectives of the Electronic and Communications Act, 2005, and the concern voiced by President Mbeki and the government that ICT costs in SA are too high. It has been suggested that such costs, “serve as an obstacle in terms of the economy, society and delivery of government services”. (du Toit, C. 2007).

To properly service this majority who are generally considered not to be economically viable will require a radical change in mindset and entrepreneurial orientation. Similarly, there is a need for innovation in the development of mobile broadband services and the use of technology to provide low cost, good quality, sustainable and profitable products and services through new business models.

To realise the potential of this market, companies must come to terms with a set of core assumptions and practices that influence their view of low income bracket earners. These assumptions are that the poor are not our target consumers

because, with our current cost structures, we cannot profitably compete for that market; that the poor cannot afford and have no use for the products and services sold in developed markets; and that only developed markets appreciate and will pay for new technology. It is further thought that the poor can use the previous generation of technology; that the bottom of the pyramid is not important to the long-term viability of our business; that managers are not excited by business challenges which have a humanitarian dimension; and, lastly, that intellectual excitement lies only in developed markets (Prahalad C.K. and Stuart L. H, 2002: 4).

To create products and services the poor can afford, mobile cellular operators must reduce their costs significantly. But this cannot be achieved by fine-tuning the current approaches to product development, production and logistics. The entire business process must be re-engineered.

Delivering mobile broadband services is a significant departure from anything that traditional mobile operators have done before and needs to be managed accordingly, if they are to continue generating shareholder value at current rates. The corporate vision and mindset needs to be re-focused towards the new world of data-centric services; customer management must be structured as a key differentiator in an increasingly competitive market; and new business models should be developed and adopted, incorporating a wider range of third party relationships. Technology investments ought to be justified and implemented within shorter timescales; application development cycles should generate more innovative and flexible solutions; and operational resources and infrastructure have to be adapted in order to achieve the necessary cost efficiencies (KPMG, 2000: 4).

Managers in mobile network operators must learn to work with people who may not have the same agenda or the same educational and economic background as they do. The challenge and the payoff are in how to manage and learn from

diversity — economic, intellectual, racial, and linguistic (Prahalad C.K. and Stuart L. H, 2002: 13).

The real strategic challenge for managers is to visualize an active market where today there is only abject poverty. It takes tremendous imagination and creativity to engineer a market infrastructure out of a completely unorganized sector (Prahalad C.K. and Stuart L. H, 2002: 6). They must develop business models which can potentially generate multiple sources of revenue through business partnerships with service providers and content providers.

1.7 Outline of the Research Report

Chapter 1: Orientation

This Chapter introduces the purpose of the research, the problem statement, research questions and the objective of the research. It also states the importance of the study and why it was undertaken; lastly, it highlights the limitations and shortcomings of the study.

Chapter 2: Research Foundation

This Chapter gives the theoretical background of the study by focusing on the present global status of the mobile cellular network operators and on the realities they face in the dynamic environment in which they operate.

Chapter 3: Literature Review

This Chapter reviews the theoretical literature to determine what strategies can be adopted by South African Mobile Operators to increase their average revenue per user (ARPU).

Chapter 4: Research Methodology

In this Chapter, the information and understanding gained in the literature review are used to design the questionnaire that will be used in the survey and interviews which are to be conducted.

Chapter 5: Research Results

The research results will be interpreted and discussed to determine whether the hypotheses that were postulated are accepted or rejected.

Chapter 6: Discussion, Conclusion and Recommendations

In this Chapter, the conclusions are drawn from the findings of the research and recommendations are then made.

The outline of the research report is also represented in a flow diagram format in figure 1.7.1.

2 Chapter 2: Foundation of the study

2.1 Introduction

The convergence of the Internet, mobile communications, the media industries, content and e-commerce services could raise revenue and thereby safeguard the future profitability of mobile cellular operators, reducing their dependence on voice as a source of revenue.

This also has the potential for reducing access costs and bringing economic benefits to millions of poor people, mostly in remote areas, who are still economically excluded on the basis of their buying power.

2.2 The Need to Increase ARPU

An article titled “Chasing Arpus”, published in the *Finance Week* of 03 November 2004, states that behind the constant innovation and reshaping of cellular phone packages by network operators (apart from gaining market share) is the need to increase average revenue per user (ARPU), the standard measure for revenue from cellular network operation.

Until recently, the mobile communication industry has concentrated on voice communication. As mobile cellular penetration reaches saturation in many developed and developing markets, and since saturated market places and increasing competition from new entrants mean increasing pressure on operator ARPU, mobile operators must find new ways of driving revenue. However, many operators are finding it difficult to achieve significant ARPU growth in their core businesses of mobile voice, since it also seems to have reached saturation. They are now turning to mobile data services –in particular high speed mobile broadband services – in the search for new sources of revenue.

In a context in which the market for mobile cellular phones is becoming saturated and price competition is intensifying, operators are turning to the emerging market of mobile data services, non-voice mobile services including instant messaging, Short message service (SMS), email and the mobile Internet & commerce as a way to differentiate their services from their competitors and to revive declining ARPU. However, despite its business potential, entrants into the mobile broadband data services market have been confounded by a host of unexpected challenges, such as insufficient demand, competition from similar products and, most importantly, non-existent or weak business models (Kallio *et al.* 2006:1).

Mobile data applications and services are seen as the opportunity for operators to fight declining ARPU and increase overall revenues both from customers for new network service offerings, and from content providers for new marketing opportunities. As a result, operators are increasingly leveraging new 3G networks to offer broadband data services, such as MMS, Internet access, music downloads, music and video streaming, video calling and mobile commerce, in order to diversify revenues.

Unfortunately, many subscribers are unaware of these services because today's technology and processes for enabling "premium content" sales are woefully outdated. Mobile operators still rely on broad-based marketing techniques, such as national advertising and bill inserts, to notify subscribers of new services. To achieve significant growth, operators must rethink their sales strategy (Biciau, 2006: 37).

Kramer and Paul go further by stating that mobile cellular phones are already being used in a variety of ways to deliver financial services. These services generally fall into three categories: mobile-purchasing (m-commerce), electronic money (e-money), and electronic banking (e-banking). The cellular phones are increasingly utilised as platforms for transacting business with financial institutions, and for accessing bank accounts, e.g. checking savings or loans.

Balances in accounts can be accessed for a number of purposes. These include purely informational purposes, as well as making payments on bank loans, transferring money from one account to another, or for selective bill-paying.

2.3 What is ARPU

It has generally become globally accepted that the ARPU commonly used by regulators, observers and the communications industry to compare the performance of mobile communications markets has decreased significantly, but there does not seem to be consensus as to what factors influence ARPU, and how it should be calculated.

Operators and Industry analysts are traditionally highly focused on ARPU, due to the fact that typically the network operator has had huge infrastructure costs which need to be serviced by a considerable ARPU. A case in point is the huge fees that were initially paid in Europe for 3G licences, and the infrastructure cost associated with them.

Many operators are hoping that the introduction of 3G broadband data services will arrest this decline in ARPU, but the limited number of 3G deployments has not yet had a positive impact on ARPU. This could change as new 3G networks come on line and uptake of services gains momentum (*Wirelessasia*, 2005, November: 12).

Some mobile operators have already made major investments in 3G network infrastructure and spectrum licences, in anticipation of substantial growth in non-voice service revenues. However, they have had limited success in expanding non-voice revenue beyond that derived from basic text messaging (SMS), and hence data ARPU has remained relatively constant. In most cases, the small increases in data ARPU that have been achieved have not been sufficient to offset the substantial declines in voice ARPU.

ARPU is a key metric used by analysts to track mobile telecommunications firms and markets. Higher ARPU may be the result of higher prices, greater minutes of use, or a combination of the two. Some national regulatory authorities (NRAs) have argued that higher ARPU is the result of lack of effective competition (McCloughan and Lyons, 2006: 521).

Others have debated whether high ARPU is due to higher usage of mobile telephony services, or whether it is the result of market power – an issue which has been a source of contention among regulators and mobile operators in other jurisdictions.

The economic model used by McCloughan and Lyons states that the level of ARPU in country i during quarter t ($ARPU_{it}$) is a function of four vectors.

$ARPU_{it} = g(\mathbf{S}_{it}; \mathbf{M}_{it}; \mathbf{R}_{it}; \mathbf{Q}_{it})$. Where:

- **S** contains service quality factors such as reputation, the extent of congestion and network coverage.
- **M** contains market environment factors such as population density, personal incomes, market maturity, industrial mix and geography. Determinants of competition, potentially including market concentration, would also fall under this heading.
- **R** contains regulatory factors such as the presence or absence of requirements for MNP, national roaming and wholesale network access services.
- **Q** describes the quantity of services provided by an operator. Depending upon the proxy used to describe prices this may include the number of users served, or characteristics of the bundles offered by operators, e.g. numbers of minutes of different types of calls, data services such as texts, etc.

Wikipedia describes ARPU as the revenue generated by a customer phone, pager etc., per month. In mobile telephony, ARPU includes not only the revenues

billed to the customer each month for usage, but also the revenue generated from incoming calls, payable within the regulatory interconnection regime.

Most operators, including those in South Africa, calculate ARPU by dividing the total revenue by the number of subscribers i.e. they take the ongoing revenue, excluding connection revenue, plus the data revenue, plus incoming Interconnect revenue divided by the average subscribers.

2.4 Declining ARPU Globally

A 2005 TeleGeography study shows that even though global wireless subscriber numbers and revenues are increasing, operators are posting declining ARPU, with a 13% global decline in Q2 to \$21.30. Eastern Europe was the biggest loser, with ARPU decreasing 27% or \$3.60 year-on-year during the quarter. Only North American and western European operators managed to post fairly stable ARPU in Q2, but both registered drops of 2%.

Table 2.1: Average wireless ARPU

Region	Q2 2005	Q2 2004	% Change
Africa	\$20.90	\$23.50	-12%
Asia-Pacific	\$18.90	\$22.30	-18%
Eastern Europe	\$13.10	\$16.70	-27%
Latin America	\$13.30	\$14.40	-8%
Middle East	\$22.10	\$22.70	-3%
US & Canada	\$49.60	\$50.40	-2%
Western Europe	\$37.40	\$38.30	-2%
Global	\$21.30	\$24.00	-13%

Source: TeleGeography study

According to Lewis, the annual results of NTT DoCoMo, a leading mobile operator in Japan, as announced in May 2004, illustrate a trend of falling consumer ARPU for both 2G and 3G networks and W2Forum analysis predicts that UK operators will experience this in 2006.

NTT DoCoMo announced that its average revenue per contract per month (ARPU) fell 7.9%, from ¥7.890 (£39) in 2003 to ¥7.270 (£36) in the financial year between 2003 and 2004.

W2Forum predicts that ARPU will plateau at £22.90, rising from £22.37 in 2004. The reason for this is that consumer spending on data content is unable to match the decline in voice revenues, because data and content services developed for mobiles have not compensated for the decline in revenues from the core voice offering. (Lewis, 2004:13)

W2Forum research shows that, between 2000 and 2006, UK voice ARPU will have fallen from £25.17 to £16.99, a decline of 32%. In the same period, spending on data will have increased from £0.12 to £1.04, a rise of 867%. While in percentage terms this is a significant increase, it is insufficient to compensate for overall falling voice revenues. Operators are looking to these content revenues to drive growth in a maturing market. Analysts forecast that data ARPU will more than double in Western Europe from 2004 to 2009, representing 29% of total ARPU by 2009 (Fathom Partners, 2005).

As the NTTDoCoMo results and the W2Forum research show, operators must think more broadly than the next technology; they should focus on the consumer spend habits and the threshold of spending that is acceptable to them.

Yan *et al.* also state that according to the annual report of China Mobile (HK), the Hong Kong listed branch of China Mobile, the average revenue per user (ARPU) per month has declined significantly over the past years. Their ARPU has declined from 431 Yuan (US\$55.26) in 1997 to 92 Yuan (US\$11.79) in 2004, representing a decline of 78.7 percent. The decline in ARPU is mainly due to the substantial growth in lower usage subscribers, and, in particular, subscribers to pre-paid services.

According to Weber; Japan is in the forefront of the mobile Internet, with the introduction and usage of new mobile data services. This is demonstrated by the resulting data ARPU calculated by Büllingen *et al.* in 2004 as €13.30 in Japan, in contrast, for example, to Germany, with €4.35 for 2003; UK €5.40 and Finland €5.30.

Weber shows furthermore that Bohlin *et al.* assert that the major driver of this in Japan is the tough competition amongst operators, with operators specifying handsets, and manufacturers producing them. It is this operator-driven relationship that has led to strong competition between the groups.

Weber goes further to quote Weber & Wingert, who say that another important factor underlying Japan's leadership is a very strong customer service orientation, evidenced by the quality of handsets and services. An objective of this attitude is to achieve "anshinkan", the sense of a state of security, or peace of mind, in the customer.

South Africa is no exception. Although penetration has increased, ARPU has declined. As mobile subscriptions have spread from the less price-sensitive business and high-end consumer market into the mainstream of South African society, the average value of a subscriber has inevitably declined.

A quick glance at the ARPU development in South Africa in Table 2.4.2 below shows that, over the six years shown, the blended ARPU declined by over 40 percent. However, this decline in ARPU has largely been halted. The blended figures for both operators have remained relatively stable lately, falling from R169 to R164 for MTN and from R163 to R1139 for Vodacom in 2006.

Table 2.4.2: Blended Mobile ARPU 2000-2006

Company	Rands	2000	2001	2002	2003	2004	2005	2006	2007
Vodacom	Blended	266	208	182	183	177	163	139	125
MTN	Blended	302	229	208	206	203	169	164	149
Cell C	Blended							152	132
Vodacom	Prepaid	132	98	93	90	90	78	69	63
MTN	Prepaid					104	93	94	87
Vodacom	Contract	481	493	560	629	634	624	572	517
MTN	Contract					597	541	487	435

Source: Company Financial Statements 2000-2006

The stabilisation of the blended ARPU at Vodacom and MTN can be ascribed in part to the churning of low spending users to new entrant Cell-C, and to an uptake of the new data services by subscribers. This uptake still falls far short of bringing the blended ARPU figures to those of, say 2000 or 2001.

South Africa is still some way away from seeing ARPU stabilisation. In Europe, most markets saw ARPU start to level off only as saturation occurred. South Africa is some way short of its own, albeit lower, saturation level. Growth is consistent at 30 percent per year, compared to typically 5-10 percent in Europe, where in many markets ARPU has, at best, stabilized. Compared to other markets, South African ARPU is still relatively high, since it is propped up by very high post-paid figures (Finnie *et al.*, 2003:68).

The result of increasing subscriber bases and only slightly declining ARPU has been an impressive growth in service revenues. The total value of the South African mobile market in the year to March 2003 was approximately R27 billion (US\$4 billion), up 20 percent from R23 billion the previous year (Finnie *et al.*, 2003:69).

In their 2004 annual reports, Vodacom and MTN declared significant profits (EBIDTA) of R7536 million and R4522 million respectively in their local operations. However, a new trend in this low ARPU market is the emergence of declining margins. Accordingly, *Finance Week* showed that Vodacom's SA blended ARPU (contract and pre-paid combined) decreased from R177 to R164

for the year to 30 June 2004, while at MTN the June figure is R189/month, down from more than R300 four years ago.

The difference between pre-paid and post-paid ARPU is huge; MTN achieved a pre-paid ARPU of R98 while post-paid figures are R585 per month. The new entrant to the mobile cellular market, Cell C, struggles the most with ARPU; 84% of its 1.6 million subscribers were prepaid users and revenue on pre-paid is R62 per month and R409 on contract, giving it a blended ARPU of just R110.

This is mainly due to its late entry into the SA market and its reliance on pre-paid customers. Cell C's ARPU (average revenue per user) is R136. The figure at Vodacom and MTN is R165 and R189 respectively, helped by a greater number of contract subscribers, who tend to stay loyal to particular networks because they are reluctant to have their telephone numbers changed (Mwanza, 2005:64).

This compares with Nigeria which despite low disposable income, has an average ARPU of US\$55 per month, second only to the highly-developed Japanese market, where data services – such as multimedia messaging, games and news services – push ARPU to \$60 per month (Chasing ARPU. *Finance Week*, 03 November 2004).

Despite the massive uptake of SMS text messaging and the popularity of ringtones, logos and other downloads, the data revenues of SA networks remain low when compared with that of other countries. Subscriber numbers' saturation results in declining ARPU. This, in combination with substantial growth in lower usage subscribers (in particular pre-paid subscribers, who make up a huge percentage of the total subscriber base), has prompted operators to change their focus from customer acquisition to retention.

Research house BMI-T also says that ARPU in the South African market has dropped by 35%, from around R214 in 2001 to R150 in 2005. Launching 3G

technology and its associated data services has enabled operators to drive more revenues in order to stem the tide of declining ARPU.

According to Mwanza, the BMI-T research analyst Smit says that person-to-person SMS's are still the major revenue spinner for networks. SMS currently contribute around 70% of data revenues generated by SA network operators, and Smit attributes that growth to the fact that almost all mobile phones have SMS capabilities; it has proved itself to be a broad-based killer application for mobile cellular technology.

As operators see mobile data applications and services as an opportunity to fight the declining ARPU and increase overall revenues, mobile cellular phones are being used in a variety of ways to deliver financial services. These services generally fall into three categories: mobile-purchasing (m-commerce), electronic money (e-money), and electronic banking (e-banking).

Mobile cellular phones are increasingly utilised as platforms for transacting business with financial institutions, and for accessing bank accounts, whether checking account balances for a number of reasons, such as informational purposes, making payments on bank loans, transferring money from one account to another, or for paying bills.

According to Kramer and Paul (2006), 25% of the people in South Africa who have never had a bank account do nevertheless have access to a cellular phone. FinMark, a British-backed non-governmental organisation that looks at ways in which financial markets can help the poor, estimates at least half of all bank accounts in South Africa will be administered via cell phones within five years.

The ability to transact using the cellular phone has made it possible for poor people to use SMS to pay for goods, transfer money to friends and family, and top up the credit on their prepaid phones. Account holders can also have their

salaries deposited directly into their cellular accounts, and can deposit cash at Post Offices and some bank branches.

Kramer and Paul also point out that a significant element in the success or failure of these services is the capacity to handle large numbers of small transactions efficiently and profitably.

The rapid emergence of virtual banking through WIZZIT, MTN Banking and FNB demonstrates a growing belief among banking and communications industries that there is a big market in the un-banked. This was also witnessed after the introduction of the the Mzansi Account, a low income transactional banking account launched in 2004.

Since their launch, these initiatives have exceeded their initial subscriber goals. As volumes grow, the banks plan to develop new applications aimed at the underserved markets.

Jonason (2002) also states that mobile communications has been transformed from being a regular voice service device with its pricing based on a per minute of use base (airtime). Mobile phones now offer a wide range of contributions from several industries. This has created uncertainty not only about how these services are charged for, but also how pricing of the existing service (primarily voice) still dominates in revenue relative to the new data services.

Indications from the mobile Internet market point to a considerable advantage for wireless operators being able to leverage their monopoly on end-user access, and charging to gain the lion share of the revenue (Jonason and Eliasson, 2001). Whilst Content and Wireless Application Service Providers are clearly an important contributor in the mobile communication value chain, they create value for the customer, and diversification for a mobile operator faced with declining average revenue per user.

Jonason concludes by emphasising the rationale of sharing information and incentives on pricing strategies with both providers and customers. He shows that by sharing information on its pricing strategy the operator increases the receiver competence of its customers, and thus reduces uncertainty on how to price. Furthermore, a shared pricing base with providers (revenue sharing) is likely to reduce the incentive for the supply side (provider) to bypass the role of the operator through Internet protocol and invent an alternative base for charging.

According to KPMG, delivering Mobile Internet services will be a radical departure from anything traditional operators have done before, but not all will make the transition successfully. The scope of change required is considerable, as both existing revenue and cost models become redundant.

To succeed, telecommunication operators must:

- Re-focus their corporate vision towards the new world of data-centric services;
- Ensure that customer management and service provision become key differentiators;
- Formulate new business models to incorporate a wider range of third party relationships;
- Implement technology investments in shorter time scales;
- Develop application development cycles that generate more innovative and flexible solutions; and
- Adapt operational resources and infrastructure to achieve necessary cost efficiencies.

Success will mean getting to market quickly, armed with the right applications and the right services. However, telecommunications operators will need to do this with partners. They must develop new ways to address their relationships with customers, vendors, applications developers, content providers and service providers. This includes entering risk sharing arrangements with equipment

vendors and application developers, and opportunity sharing arrangements with information and content providers.

As a result, the distribution of value in the value chain will rapidly shift. Presently, 70% of the value has remained with the operator; in future, 75% of the value will belong to content providers, content creators and service providers. Few, if any, operators can make the transition from providing voice services to providing the new mobile data services without a partner which will share risk, maximise opportunity, and minimise time to revenue.

For operators to succeed in the new data arena, they will need not only to adopt new business models but will also need to generate multiple sources of revenue through commercial transactions with third party content providers. Even more importantly, they will need to forge new relationships with customers and vendors alike. Each faces fundamental challenges if they are to continue generating shareholder value.

As a result, a number of critical success factors will govern the survivors:

- The ability to transfer risk, particularly technology and implementation risk, to those best able to manage it.
- The ability to develop innovative end user applications rapidly to gain first mover advantage.
- The implementation of state-of-the-art self-service operating and business support systems.
- 'Get to market first' ambition, armed with the right services aimed at the right customers.
- Decreasing cost of operations utilising zero touch customer care.
- Providing not only transport, but creation, aggregation and personalisation of content and information.

New infrastructure based on data communications principles will drive business models more closely towards the data and computing industry, and away from

the telecommunications industry models of incumbent market dominators or oligopolies. Future business models will have much lower costs, with simpler operational processes. Moreover, we can expect to see content provision appearing in the traditional value chain, as shown in figure 2.1 (Bohlin *et al.*, 2005).

Bohlin *et al.* further state that future communications infrastructure points to several new types of player and accompanying business models; two factors distinguish these future business models from the past. These are that the key to revenue generation will be to maximise the number of very low paying customers, instead of the maximum ARPU per customer, and that the key to margins will be based on successfully creating lean operations for cost-based pricing i.e. understanding the cost structure for very small margins per customer.

This is a major challenge for conventional operators and, because new infrastructures will accompany new business models, this will tend to make the current business models untenable. Accordingly, the current operators will have to adapt, or fail.

3 Chapter 3: Literature Review

This chapter reviews various literatures with specific attention to strategies that are being adopted by Mobile Cellular Network Operators in their quest to stimulate the usage of broadband multimedia services by the middle and lower income bracket groups.

Four theoretical models are considered when analysing and reviewing the literature. The first model is the technology acceptance model (TAM), and the classic Rogers model, which defines five adopter groups, including innovators, early adopters, early majority, late majority, and laggards, as shown in the list of figures (figure 3.2).

The second model is the marketing mix, to determine how these products can be delivered at the right place; the right price to suit different target markets; and how the products can be promoted better, to inform the customers about their attributes (Perreault & McCarthy, 2002).

The third model is the value net framework devised by Brandenburger and Nalebuff. This framework highlights the critical role that complementors – participants from whom customers buy complementary products and services, or to whom suppliers sell complementary resources – can play in influencing business success or failure (Ghemawat, 1999).

The Last model is the marketing concept and customer value model of customer acquisition, customer satisfaction and customer retention. This also involves determining customer needs in order to find the right products and their benefits to meet those needs (Perreault & McCarthy, 14th edition).

3.1 Technology Adoption

According to Baron *et al.*, Meamber and Venkatesh state that consumer behaviour is no longer considered to be merely a psychologically motivated individual act, but also a culturally, as well as socially and ideologically, driven set of consumption practices and belief systems.

Virtually all of the reported research has adopted a quantitative modelling approach to measure the effects of behavioural beliefs (originally “perceived usefulness” and perceived ease of use of the technology) on users’ attitudes towards technology, their intention to use the technology, and actual usage of the technology. The focus has mainly been on technology acceptance in organisations. Thus the determinant “perceived usefulness” was defined in terms of a belief about how the technology would enhance job performance, and “perceived ease of use” was defined in terms of a belief about how much the use would be free of mental effort (Lu *et al.*, 2003).

The players in the mobile industry are regularly seeking to introduce new products, and make huge investments that reflect their predictions of acceptance of the technology and services that they develop, for example with Wireless Application Protocol (WAP), GPRS, EDGE, Third Generation Systems (3G), DVBH, HSDPA, HSUPA, WiMAX etc.

The findings of a study conducted by Baron *et al.* suggest strongly that explanations and predictions based on rational, intuitive models of consumer behaviour may be an insufficient basis for determining a major investment.

The technology acceptance model shown in figure 3.1 assumes that beliefs about usefulness and ease of use are always the determinants of information technology adoption (Lu *et al.*, 2003).

On the other hand, Hsu *et al.* show that Moore and Benbasat developed and measured a framework that identified perceived attributes which may influence the adoption of IT innovation. The main attributes were derived by Rogers from

the literature on diffusion of innovations; these include relative advantage, ease of use, compatibility, observability and trialability.

Hsu *et al.* also indicate that Chen *et al.* applied a technology acceptance model (TAM) to examine consumer behaviour in the virtual-store context. Their findings indicated that compatibility, perceived usefulness and perceived ease of use were the primary determinants of consumer attitudes towards using virtual stores. Factors identified as influences on cellular phone banking adoption included relative advantage, trialability and consumer banking needs. These studies confirmed that characteristics identified by Rogers do explain acceptance behaviour in specific contexts.

The classic Rogers model defines five adopter groups. These include innovators, early adopters, early majority, late majority, and laggards. These results are consistent with Rogers' viewpoint that innovators and early adopters generally have higher socioeconomic status, personality values, and communication behaviour than later adopters. This observation has also been confirmed by another empirical study. Hence, these two groups of adopters are likely to have higher perceptions and intention to use new services than others. These findings therefore imply that appropriate strategies should be employed for specific adopters.

The findings of a study conducted by Hsu *et al.* generate insights into mobile operators concerning the fact that broadband data services may overtake SMS. However, users may be concerned about price issues before they decide to use them. For example, according to Hsu, Wu and Wang found that high cost has a negative influence on users' intentions to use mobile commerce. Therefore, it is important for managers to understand the threshold of spending which users can accept.

Additionally, the result of the study by Hsu *et al.* shows that visibility considerations are important for the late majority group. This finding indicates that this group needs information to evaluate before making a decision.

Therefore, when late adopters have the opportunity to observe the use of data services by others, they will have a higher tendency to use it. Other people's experiences can become the information for their evaluations of data service adoption. Therefore, managers should strive to encourage opinion leaders and users to influence potential adopters to use mobile data services.

Equally, content providers should improve the ease of use and the user friendliness of their data services to increase their acceptance. Ease of use has been found to have a significant effect on adoption intentions for experienced users.

Hsu *et al.*'s study also shows that image has a significant influence on adopting intention. This is consistent with the findings of a previous study by Teo and Pok, who found that image has a significant effect on the intention to adopt WAP enabled mobile phones; hence, using broadband data services may be viewed by some people as an indication of social status.

Baron *et al.*, on the other hand, strongly suggest that explanations and predictions based on rational, intuitive models of consumer behaviour may be an insufficient basis for determining a major investment. In the mobile industry, consumers can, through creative use-initiation, deliberately foil intuitively sound supplier actions.

Their findings show, moreover, that UK mobile phone networks expected picture messaging to match the success of text messaging, and offered the service at approximately double the cost. For experienced SMS users, picture messaging is easy to use; a picture is perceived to be more enjoyable to send and receive. Picture messages are seen as a useful way of sharing life with friends and relatives. Yet, frustratingly for the operators and content suppliers, after initial "early adoption", the frequency of sending picture messages via the networks dropped by nearly 50 per cent between September 2003 and 2004 (Gibson, 2004).

Consumers still took photographs with their mobile phones, but, instead of sending them via the networks, they created electronic photo albums in the handset's memory, which they then showed to friends and relatives face-to-face. They saved money and experienced the shared enjoyment associated with viewing the pictures together.

3.2 Involving Innovative Users in Service development

As technology-based service provision replaces face-to-face service encounters, companies risk losing touch with their customers, and thereby forego an important source of information for their new service development process (Curran *et al.*, 2003). Furthermore, as new technologies proliferate through everyday life, ample anecdotal as well as survey-based evidence suggests signs of growing consumer frustration and disillusionment.

Matthing *et al.* (Rust and Lemon, 2001; Trott, 2001) argue that one reason for the apparent mismatch between technology-based services and people's needs is that conventional market research techniques are not effective for such services and, according to von Hippel and Katz (2002), they only manage to skim the surface of user needs.

They also quote Menor *et al.* (2002) and von Hippel (2001), who contend that employing a "user involvement" approach would be more effective in this regard. The involvement of customers will provide a deeper understanding of their needs and increase the likelihood that the new service ideas will meet those needs (Alam and Perry, 2002).

In addition, they cite other findings (Alam, 2002; Magnusson *et al.*, 2003; Olson and Bakke, 2001; Thomke, 2003) which indicate that the results of recent empirical research into companies' intensified interaction with customers reveal that involving customers will improve the effectiveness of new service development.

They also quote Goldsmith and Flynn (1992), Parasuraman and Colby (2001), Rogers (1995) and von Hippel (1988), who contend that an important challenge facing companies is the identification of innovative customers who are likely to be most helpful during new service development.

The challenge is the identification of innovative customers (i.e. end users and consumers), and the effective deployment of such customers to generate new product and service ideas in a technology-based service setting. Only a small minority of customers are likely to be innovative and creative enough to be of help to companies interested in developing technology-based services. Thus, a process for identifying these customers is critical for the successful development of new technology-based services (Matthing *et al.*, 2006:289).

Results from the two studies conducted by Matthing *et al.* show that the technology readiness index (TRI), a construct that specifically addresses and incorporates the underlying paradoxical attitudes that individuals seem to experience when exposed to new technology, appears to be an effective tool for identifying innovative customers who would be both willing to participate in new service development and capable of generating creative ideas.

Hence, marketers of technology-based services can employ this tool for selecting the most appropriate end users for involvement in their new service development process. Again according to Matthing *et al.*, researchers have proposed that firms should direct their energies towards a small sample of innovative users (Olson and Bakke, 2001; von Hippel, 1978, 1988; Thomke and von Hippel, 2002). These lead users are “early birds” in discovering and acquiring new technology, as well as new products and services (von Hippel, 1986).

By observing the needs of these lead users and the solutions they have worked out, companies can foresee the services of tomorrow and adjust their own development work accordingly. Such lead users are skilled at predicting future conditions and also have a clear need for solving their present problems. Thus, capability and motivation are essential qualities which make lead users especially

valuable to firms attempting to develop new technology-based services (Matthing *et al.*, 2006:289).

New service development relies on the complex task of understanding and anticipating latent customer needs. To facilitate proactive learning about the customer, recent findings stress customer involvement in the development process, and observation of customers in real action. (Matthing *et al.*, 2004:479).

The service-centred view of marketing is customer-centric (Sheth *et al.*, 2000) and market-driven (Day, 1999). This means more than simply being consumer-oriented; it means continually collaborating and learning with customers, in order to respond to their individual and dynamic needs (Matthing *et al.*, 2004:479).

Service-centred logic implies that value is defined by and co-created with the consumer; it is determined by the customer on the basis of value-in-use, rather than being embedded in predefined output (Vargo and Lusch, 2002). Thus, from a new service development perspective, the customers become not only a necessity, but also an opportunity (Matthing *et al.*, 2004:479).

Matthing *et al.* refer to Slater and Narver (1995), who maintain the need to develop close and trusting relationships to increase customer perceived value. Such relationships are fostered by a market orientation. Market orientation, as an implementation of the marketing concept, entails learning about customer needs, the influence of technology, competition and other environmental forces, as well as acting on that knowledge in order to become competitive.

Furthermore, in Matthing *et al.* (2004:479), Day maintains that organizations continuously learn about their markets through the linked processes of market sensing and sense making, which follow the usual sequence of information-processing activities. Market sensing includes the collection and distribution of information about the needs, expectations, and requirements of customers through open-minded inquiry.

This also includes the interpretation and utilization of the collected information. Further learning is achieved when an evaluation of the findings is done, and is converted into knowledge about the customer.

Matthing *et al.*, also refer to a study by Morgan *et al.* (1998) which showed that firms with high market orientation possess a greater organizational learning capability. They further quote Day (1994a) and Sinkula (1994), who suggest that organizational learning is valuable to a firm and its customers. It is said to support the understanding and satisfying of customers' expressed and latent needs through new products, services, and ways of doing business. Organizational learning makes it possible not only to create products ahead of competitors, but also to create them before the recognition of an explicit customer need (Hamel and Prahalad, 1991; Slater, 2001). Consequently, it is argued that a firm's long term performance is dependent both on customer satisfaction with the present offering, and on the development of new products and services (Flint, 2002; Slater and Narver, 1995).

If a company can look at its environment beyond its familiar assumptions, it may be able to discover new directions and new possibilities, and thus create new innovative services. Hence, in terms of innovativeness, the process of customer involvement clearly seems to benefit services ideas, since it creates a situation for learning about the customers' latent needs (Matthing *et al.*, 2004).

The findings of the study by Matthing *et al.* show that there are several problems associated with customer involvement. One reason could be that the company's current structures, processes and culture prevent them from continuing with customer involvement in its current form. Management explained that product concepts, generated by lead users, were seen as ambiguous and overly simplistic, and were therefore regarded as less valuable by the new product development personnel.

Whilst involving the customer has positive spin offs, Matthing *et al.* warn that Anderson and Crocca (1993) learnt from their co-development project that there

were communication barriers between users and developers; the attitude of product developers made customer involvement difficult.

Lastly, according to Matthing *et al.*, Nambisian (2002) identifies three important challenges associated with customer involvement: the difficulty of identifying an appropriate set of customers; the difficulty of creating appropriate incitements for participation; and the difficulty of capturing the customers' knowledge.

Therefore, managers must firstly adopt a proactive approach and involve customers early in the service development. A service is generally perceived as an idea, and a continual flow of service ideas is necessary in order to succeed. Secondly, a focus should be put on capturing latent needs. Customer solutions, however, should not be dismissed as unrealizable. Behind the solution, there might be an interesting, yet unfulfilled, need. Thirdly, although service providers can obtain customer input using several other means, they should consider the techniques and ways of working as they strive to uncover customer latent needs. Finally, innovation should not be left solely to engineers or service developers. Different knowledge and skills are needed to identify latent needs and to learn from customer behaviour, experiences and preferences (Matthing *et al.*, 2004).

3.3 Data Warehousing and Mining

Companies have used technological innovations, such as data warehousing and data mining, in an attempt to gain greater insight into the prediction of consumer purchase behaviour, but with only limited success. This may be because the theories on which an understanding of consumer behaviour is based may themselves be inadequate. Alternatively, the basic assumption that consumer behaviour is constant and so can be predicted may be unsound.

According to Bareham (2004), consumers are less predictable than it was thought; a range of paradigms or models may be necessary to understand the variety of behaviours engaged in by individuals in different contexts. Bareham states further that the latest approach to understanding customers is through

creating customer insight (CCI). This allows segmentation of customers in relation to what technology they use, and how they use it.

Large quantities of data can be collected about consumers from requests or purchases made via the Internet, e-mail, text messages, mobile phones, and from checkout information. Data warehousing makes it possible to assemble a range of consumer data in one location, including the tracking of customer purchases and behaviour over several years. Data mining, on the other hand, potentially makes it possible to predict future response to a promotion or a new product through analysis of past behaviour, and hence to create focussed and tailored marketing activity (Hirschowitz, 2002). In addition to conventional ways of segmenting customers in the marketplace, it also makes it possible to personalise a campaign for each person in the segment (Bareham, 2004:161).

Bareham also states that, according to Batterley (2002), relationship marketing (RM) has replaced customer relation management (CRM). Rather than pushing the product or service at the consumer, it attempts to create temptation, continuously reinvent the offering, and build a lasting and trusting relationship.

Learning more about the customer can ensure that local operators do not dump first world services on developing countries which might have other priorities and interests. It also obliges them not to merely modify these services to give them a local flavour (by simply putting on their logos and then launching them), without having researched whether indeed that is what the local consumers want. It also guards against a situation in which operators may not even have ascertained whether they will indeed generate any revenue out of them, and hence whether they will increase the data ARPU.

Bareham also argues that at times technology may also serve to distance the consumer from the service which the company is trying to provide; for instance, recent research by Mintel (2002) shows that call centres are dramatically failing to meet customer expectations. Sixty percent of the respondents complained

about the time spent waiting on hold; they were frustrated by various aspects of service related to automated interactive voice response (IVR), where the synthetic voice does not provide effective routing of the call. Waiting on hold can be over 15 minutes before connection to a live service agent, which sometimes leads to call abortion and frustration.

Finally, Bareham draws the conclusion that, since even with technological advances and increasingly sophisticated methods of market research companies are often unable to predict or define consumer purchases or behaviour, the ideas or premises on which the understanding of consumers is based may be suspect. It may also be the case that some of the emergent consumer groups in society, the grey market and the youth market may not behave in the same way as the traditional groups perceived to make up society. Bareham also quotes Edwards (2002), who asserts that marketing and advertising agencies often base their views of consumer trends on those of 18-45 year olds living in multiple occupancy groups, because that is the age group employed by such agencies.

Perreault & McCarthy (2002) also argue that developing an effective marketing strategy involves a process of narrowing down to a specific target and marketing mix which represents a real opportunity. This narrowing-down process requires a thorough understanding of the market, enhanced by careful analysis of the customer's needs, current or prospective competitors and the firm's own objectives and resources.

3.4 Communication channels

Sharma & Mehrotra (2006) refer to two distinct strategies; the first strategy being to communicate with the customers through multiple channels. Typically, these are intra-firm and encompass email, telephone and sales force. The second strategy is reaching the customer through both internal and external distribution channels e.g., Internet, sales force and VARs.

Sharma & Mehrotra also refer to Balasubramanian *et al.* (2005) and to Slater and Olson (2002), who maintain that customers seek specific channels, as each channel has unique offerings that fulfil customers' need. Similarly, they claim that each channel attracts a specific type of customer, and so some customers may not approach the firm if that type of channel is not available. Balasubramanian *et al.* further suggest that the following factors affect customers' choice of channels: economic goals, quest for affirmation, symbolic meaning associated with the product and shopping, social interaction, experiential impact and reliance on schemas for purchases.

Extensive multichannel strategies increase coverage, and allow firms to reach a higher proportion of customers by matching the needs of the customers. Some distribution channels are better at reaching certain types of customers, and multichannel strategies enable a firm to reach each type of customer. In addition, multichannel strategies allow customers to interact through the channel of their choice (Sharma and Mehrotra, 2007:22).

Customers who interact across channels have higher sales and are more profitable than customers who use only one channel (Kumar & Venkatesan, 2005). In addition, multichannel customers provide higher revenues, higher share of wallet, and higher customer value, and have a higher likelihood of being active. Multichannel strategies aid in awareness and trial of the brand. Higher levels of awareness and trial lead to enhanced sales and profits (Sharma and Mehrotra, 2007:22).

The above suggests that firms should attempt to access as many different channel members as possible. However, there are two reasons why an unlimited strategy may not be the most effective. First, the returns from additional channel members may not be high. Second, channel conflict could lead to channel members not promoting the firm's product, which in turn leads to negative returns in multi-channel strategy (Sharma and Mehrotra, 2007:22).

The summary of literature suggests that firms need to adopt multichannel strategies for increased presence, awareness, trial and sales. However, multichannel strategies may have two negative consequences that firms need to consider. First, firms have decreasing returns to scale and new channel members may actually be unprofitable. Second, potential channel conflict increases with increased multichannel presence. Therefore, firms need to consider the trade-offs of the benefits of multichannel strategy as against potentially negative consequences (Sharma and Mehrotra, 2007:23).

The firm also needs to determine the profitability of each channel member. As stated earlier, the largest and most profitable customers and channel members are approached first, since these constitute the low-hanging fruits for a firm. As firms expand their coverage, each subsequent channel member typically provides lower levels of profits. Since there are usually decreasing returns to scale, the profitability of each new channel member is expected to be less than the previous member and needs to be calculated (Sharma and Mehrotra, 2007:23).

The above confirms the Pareto principle (80/20 rule), which suggests that 80% of the sales come from 20% of the customers. Initially, therefore, operators should concentrate on these customers, but at the same time must also adopt strategies that will capture the millions of subscribers at the low end of the economic bracket, where margins are small but the quantities are huge.

3.5 Meeting the Needs of Teenagers

On the other hand, Spero & Stone (2004) emphasise that consumer marketing companies will have to learn to meet the needs of teenagers, a very discerning and highly cynical audience, by combining the best creative ideas and strategies with a transformed approach to marketing sales and service. Such an approach needs to embody the best of information and communications technology, reliably and securely implemented.

Brands targeting teenagers need to understand emerging behaviour to get closer to their target audience, and in order to establish more relevant and credible relationships with them. It is important to work with them and to allow the brand to harbour their current behaviour, values and attitudes.

Many companies ignore the power of young money and the influence young people have over their parents' finances. Teenagers are a powerful consumer spending group in their own way, largely uninfluenced by the very brands that seek to target them.

Spero & Stone further affirm that patterns of adaptation mushroom and then wither away quickly, at a pace which is hard to understand. However, new technologies are picked up quickly provided that they observe the basic rules of economy (not too expensive), adaptability (quick, easy and cheap to adapt to user needs), technical pervasiveness (you can use them anywhere) and market pervasiveness (lots of people are using them and so it is easy to establish your own network of connection).

Network operators and content providers therefore need to realise that new technologies and services can be picked up quickly, as long as they are not expensive, and as long as they are adaptable, technically pervasive and market pervasive. Lastly, they need to realise that most teenagers will not buy any product that does not fit into or enhance their lifestyles.

Wickham (2005) shows that a survey by the Pew Internet & American Life Project found that nearly 87 percent of U.S teenagers are Internet users. That's 21 million teenagers between 12 to 17 years, up from 73 percent five years ago. By comparison, only about 66 percent of adults use the Internet. 84 percent of the teenagers also reported owning at least one communication device: a desktop or laptop computer, a cell phone or a personal digital assistant.

According to Wickham, if operators can develop a relationship today with this group of subscribers, they will be future-proofing their subscriber numbers. The survey shows that today these teenagers send or read e-mail (89%); go to websites to get information about movies, TV shows, music groups, sports (84%); play online games (81%); go online to get news or information about current events (76%); send or receive SMS's (75%); go online to get information about colleges (57%); buy merchandise online (43%); and look for information about a health topic that is hard to talk about (23%). These teenagers who rely so heavily on the Internet could very well be the next big wave of new high ARPU mobile wireless users.

However, a survey conducted by the BMI-T group (2006) says South Africa is already edging into the early majority phase of emerging digital media adoption, at least for those citizens who have access to PCs and the Internet. Storing and sharing digital content has become a national pastime, as nearly everyone is comfortable with electronic messaging, digital pictures and music. South Africans of all ages, but particularly the younger generation, love their PC and cellular devices, not only for work purposes but for all types of entertainment (Hamilton *et al.*, 2006).

But the survey further warns that there is still a large gap between the different population groups in respect of access to these services; whites, Indians and coloureds still have much greater adoption rates than black South Africans, although the historically disadvantaged communities are all moving up rapidly in this regard (Hamilton *et al.*, 2006).

The Vodafone report prepared by Fathom Partners say that according to Juniper (2004) younger consumers are often more technically literate than their parents, and their enthusiasm is one of the key drivers for the success of non-voice revenue on mobiles. This has already been demonstrated by the enormous success of the ringtone market, which was valued at over \$1bn in 2003.

There is, however, another sector in the media industry that is taking advantage of the growth in mobile content usage – the adult entertainment industry. Growth forecasts vary, however Strategy Analytics estimated that adult mobile content revenues in 2004 were approximately \$400m globally, and expected them to grow to \$5bn by 2010 (Fathom Partners, 2005:3).

Most societies accept the right of adults to have access to adult content. However, it is clear that an organisation which does not act responsibly over the delivery of such services may not only lose the trust of its customers but may also attract penalties from regulators, as governments try to protect consumers (Fathom Partners, 2005:3).

Therefore, as operators and content providers provide the content, they must protect consumers from inappropriate and illegal content, as well as empowering them with the knowledge to make informed choices about the content they want to consume. A key component within this overall objective is the protection of minors from age restricted and illegal content (Fathom Partners, 2005:4).

They must also consider that there are various ways that content can be accessed from a mobile e.g. through the operator portals, 3rd party WAP sites and the Internet. Age verification processes are difficult to implement as the registration of pre-pay phones is not obligatory. Lastly, parents give cellular phones to their children for safety and for peace of mind. However, if the parent purchased the handset on a contract, the operator may assume that the owner of the handset would be over 18 years old and unintentionally allow the child to access age restricted content (Fathom Partners, 2005:4).

On the other hand, an article in *Wireless Weekly* by Marek (2005) states that Cingular Wireless executives admit that their data strategy caters to the mass-market subscriber base, with its emphasis on simple data services such as text messaging and ringtones, instead of more sophisticated services like 3D games or even mobile video. They want to maximize their opportunity by making it simple.

Cingular Wireless sees text messaging as a stepping stone for customers to more lucrative data services. The company has found that 90 percent of subscribers, once they use text messaging, are likely to experiment with other forms of data services, such as downloading a ringtone or game. "Once they text message, they see their phone as something other than a voice device" (Marek, 2005: 10).

Whilst many U.S. operators have insisted on the walled garden approach, Cingular Wireless took a dramatically different approach to content, effectively opening up its network to third parties. The company believes in allowing customers to buy content through a variety of channels, including those off portal, expressing the view that, "We believe in an open environment." Likewise, they say, "We are not our customers' parents. It's not our job to regulate beyond what we should regulate." (Marek, 2005: 10) The only caveat is that the third-party content providers must have good business practices, meaning that they cannot lure customers into subscribing for their service without being upfront about the charges. Cingular Wireless is, however, not worried that these third-party content providers will circumvent them by not paying them a cut of the revenue (Marek, 2005).

There is, though, one limitation to the open portal model. Cingular Wireless will offer a walled garden scenario for children, and is working with Cellular Telecommunications & Internet Association (CTIA) to develop guidelines for content rating and classification. They envision a scenario in which they would use parental controls to create a walled garden atmosphere for children, at the parents' request (Marek, 2005).

3.6 The Lower Income Group

A study (2006) designed by the Consultative Group to Assist the Poor (CGAP), and produced through a partnership between CGAP, the United Nations

Foundation, and the Vodafone Group Foundation, with important contributions from South Africa's FinMark Trust, has shown that poor people in South Africa are using mobile banking services and value them highly. It also identified the challenges in bringing mobile banking to larger numbers of poor consumers, including the need to better understand poor people's perceptions of banking, technology and mobile-banking.

In order to be successful, mobile operators must listen to their customers and adapt their services to suit their customers' needs. Those that were previously silent and ignored can now be heard, and the industry must take account of this. This means challenging traditions, and adapting existing business models in order to provide real, relevant benefits to people.

Banking through mobile phones has been common in developed countries for years. But the real potential of 'm-banking' may be to help give millions of poor people access to financial services for the first time. As mobile phone usage expands, so may opportunities to bank the un-banked. With m-banking, low-income individuals no longer need to use scarce time and financial resources to travel to distant bank branches, often located far from their communities. And since an m-banking transaction costs far less to process than a transaction at an ATM or branch, banks can make a profit handling even small money transfers and payments (Ivatury & Pickens, 2006:2).

Mobile is already reaching the un-banked poor; in South Africa and Botswana, one-third of people without bank accounts own a mobile phone or have access to one. Many of these people are poor. M-banking therefore holds great promise. But questions remain about whether poor customers will adopt m-banking. For example, will low-income customers view banking through their mobile phones as reliable? Will limited schooling and unfamiliarity with technology slow their adoption of the service? (Ivatury & Pickens, 2006:2).

The study shows that m-banking services are valued by poor people in South Africa and may be more affordable than traditional banking. It also suggests that m-banking providers must build greater awareness of their services, and must

find the right balance between a human touch and technology in order to appeal to greater numbers of low-income customers (Ivatury & Pickens, 2006:4).

With a clearer understanding of this unemployed and un-banked segment, m-banking providers may discover better results in branding their service as a safer, more convenient payment mechanism, rather than marketing it as a better bank account (Ivatury & Pickens, 2006:4).

Another study conducted by Goodman and Walia in Egypt found that affordability is a major barrier to increasing the take up of mobile services in low-income markets, where the ability to pay is severely restricted beyond the top socio-economic tier of the population. Mobile operators have taken a number of steps to address this low-income market, including offering prepaid tariffs with low entry costs.

Low-income customers often have sporadic cash flow and are usually on daily or weekly wages. However, the ability to top-up airtime in small increments enables low-income users to manage their airtime consumption in line with their restricted and unpredictable cash flow (Goodman & Walia, 2006:7).

Many users purchase airtime using balance transfer from resellers and dealers. Although some users will purchase airtime from friends and family in exchange for cash, the main source of purchased airtime is the diffuse network of small scale dealers and resellers that offer airtime via balance transfer with a small profit margin (Goodman & Walia, 2006:7).

But, according to Kramer and Paul (2006), the most important thing is to know the customer. The bottom of the pyramid has suffered both from a lack of being appreciated as an accessible and worthy market, and from an acute lack of hard data on low-income individuals as economic actors.

To achieve success in the bottom of pyramid, new business models are proving a necessity for the bottom of pyramid. These entail a willingness and ability to move away from traditional models (high gross margin, high unit cost) and adapt to the economic realities of the more fully understood consumers with specific products and services. As opposed to stripped down versions of top of the market products and services, several new models are designed around better knowledge of the customer, and seem to be finding traction (Kramer and Paul, 2006).

This strategy of offering miniscule loans to very poor people, giving them the means to generate income and work their way out of poverty, was pioneered by Muhammad Yunus, managing director of Grameen Bank in Bangladesh, and a pioneer in the practice of micro credit lending (Knowledge@Wharton, 2005: 1).

Most mobile communications experts and analysts hence agree that the biggest challenges facing this exploding sector are not the technologies, but the business models used to serve this growing market.

Lastly, Kramer and Paul show that successful entrants are building from the ground up, engaging local communities deeply, and are appreciating the potential size and strength of the market; they are thus committing for the long haul.

While much attention has been focused on high-volume end users, less emphasis has been placed on applications and services that would encourage the use of mobile data technologies by small and medium sized enterprises (Harker & van Akkera, 2002).

According to Harker and van Akkeran previous studies have identified that the marketing of technological innovations to small and medium sized enterprises is a minefield of emotions, attitudes, behavioural intentions and perceptions, coupled with other important factors such as cost and technical complexities.

Lack of speed has been highlighted as a barrier to adoption, since mobile data technologies are slow and hence insufficient (Taylor, 1999; Saunders *et al.*, 1999). Another barrier can be the lack of a standardised IT environment for developing mobile data applications, which impedes the growth of the mobile data market (Harrison, 1999; Axby, 1998). Limited bandwidth, higher usage cost, increased latency, susceptibility to transmission noise and call dropouts are also possible barriers to adoption (Duffy, 1999). In addition, problems with mobile devices, such as limited memory and central processor unit (CPU) size, small screens, low bandwidth and erratic connections, were identified as further adoption barriers (Johnson , 1999).

The situation is different in 2007. Mobile terminals are smaller and lighter, and have smaller keyboards, larger full colour screens, smaller batteries and more power (wattage). They have longer battery life, integrated antennae, 32/64/128K 3Volt SIM's, larger memory, faster processing power and a wide range of functionality. The bandwidth has also increased, and the download speed has increased from 64k to 7.2Mbits per second, with intentions of going to 14.4Mbits per second. But this is still a problem for the bandwidth-hungry broadband services.

Harker and van Akkeran's findings show that consumers are not interested in the architecture, standardisation issues or how the technologies work. What they require is a device that works, and which provides effective access to the content that they want to access. They want communication applications personalised to their individual needs.

In other research, Anderson & Billou (2007) revealed that some companies have quietly pursued strategies of experimentation in developing unique product and service propositions for some needy consumers. They have accepted the challenge of serving the poor and have been able to do so profitably. At the heart of virtually all of their success has been the development of an approach that delivers the 4As i.e. availability, affordability, acceptability and awareness.

According to Anderson and Billou there are four major challenges in serving bottom of the pyramid markets (low income group):

1. Ensuring availability of products and services. Unlike in the developed world, distribution channels in these markets can be fragmented or non-existent, and the task of simply getting products to people can be a major hurdle to overcome.
2. Ensuring that products or services on offer are affordable. Bottom of the pyramid consumers have low disposable incomes and products may also need to match the cash-flows of customers who frequently receive their income on a daily, rather than weekly or monthly basis.
3. Gaining acceptability for the product or service. Therefore, there is a need to offer products and services that are adapted to the unique needs of both customers and distributors.
4. Inaccessibility to conventional advertising media. Building awareness is another challenge for companies wishing to serve low-income consumers in the developing world.

Anderson and Billou give an example of a global fast-moving-consumer-goods company, Unilever, which believes that poor countries could well hold the key to the company's long-term profitability. The company anticipates that by 2010, half of its sales will come from the developing world, up 32 per cent from figures at the turn of the millennium. In particular, they give an example of Hindustan Lever Ltd, the giant of India's US\$13.8 billion consumer goods market, which has spent years developing a distribution system that enables its products to reach even the most isolated consumers.

By leveraging availability, affordability, acceptability and awareness, companies can achieve growth and profit, two elusive goals in many developed markets. Delivering the 4As has also enabled companies to provide significant social good. Low income consumers have benefited from access to products and services uniquely tailored to meet their needs, and often at a lower cost than in the past (Anderson and Billou, 2007).

3.7 Operator Driven Business Models

Kallio *et al.* (2006) state that recent literature on business model definitions has also focused on dissecting a business model into its components. They quote Osterwalder A., Ben Lagha S. and Pigneur Y. (2002), who believe that business models consist of four elements or “pillars”: the products and services a firm offers; the infrastructure and network of partners needed to create value; the relationship the firm creates with the customer; and the financial (i.e. cost and revenue) aspects.

Kallio *et al.* point to Japan as the first country celebrated for successfully introducing a mobile data service, and, with the exception of countries like South Korea, remaining one of the few countries able to grow and sustain a significant subscriber base in mobile data services. As of March 2003, there were 61.8 million subscribers of mobile data services in Japan (Henten *et al.*, 2003). In contrast to the European operators who targeted WAP towards the high-end business user, NT DoCoMo, a leading Japanese operator, wanted to create a product that would attract the average consumer. To achieve this, their design team insisted that their product (i-mode) should be easy-to-use and affordable.

With fifteen countries in the EU, and a population of 380 million people, Europe has one of the largest mobile markets in the world; it represents an immense potential market for mobile data services. Unfortunately, however, mobile data services, with the exception of SMS, have largely been a disappointment in Europe. In fact, the mobile data services market has been no stranger to setbacks, WAP was a failure, and GPRS adoption rates have thus far been relatively low. In addition, intensifying competition, over-expansion, write-downs from the exorbitant sums paid for 3G mobile licenses, and diminished access to external financing, have left many incumbents financially constrained with little room for new initiatives (Kallio *et al.*, 2006).

Kallio *et al.* refer to Maitland *et al.* (2003), who contend that another consequence has been the decision by some operators to develop content in-house, a practice that has proven costly and time consuming. Gradually, however, operators are learning to partner. This means allowing content and service providers into the mobile data services value chain, sharing revenues, and focusing more on creating a positive user experience than on selling faster and more advanced technologies. Operators such as Vodafone have begun to copy elements of the i-mode business model by partnering with content providers, sharing revenues and working more closely with handset manufacturers (Salz, 2003).

Kallio *et al.* also refer to Clark-Dickson (2003), who asserts that South Korea, on the other hand, has taken its product development strategy even further than Japan's by creating a range of services catering to different age groups. However, this strategy has proven difficult to transfer as European carriers seeking to emulate the strategy have had to contend with an existing base of predominantly prepaid users. They have also had to face technological constraints owing to incompatible platforms and concerns about cannibalising existing services.

Kallio *et al.* also refer to Briody (2003), who maintains that NTT DoCoMo was careful in managing customer expectations, advertising its mobile data services as a "new kind of wireless service" as opposed to a wireless "Internet" experience, whereas South Korean operators have made concerted efforts to market mobile data services as fun and easy to use, thereby "training" customers to demand their mobile data services. In contrast, European operators have marketed their services by focusing on the technology, at the expense of explaining how the new technology can be used – with lacklustre results.

The findings of the research by Kallio *et al.* (2006) show that a successful transition from mobile voice services to mobile data services represents a significant shift in focus and approach for all industry participants, and in

particular for operators. Instead of focusing purely on increasing bandwidth and complex technologies, successful operators are increasingly focusing on improving the user experience through coordinated handset and service design. They are also focusing on creating effective billing systems, offering services at reasonable prices, and targeted marketing strategies.

3.8 Innovative Pricing

Regardless of its value, however, a product will not be a success (in terms of profit) unless its producer (owner) can make it chargeable in the market (Jonason, 2002).

According to Jonason, the owner of the valuable entity (in this case, the content providers/WASP/SP) and the owner of the chargeable entity (in this case, the network operator) are two separate companies and, therefore, need to agree on a pricing contract, such as for the delivery of the content and applications to the mobile devices. These typically include news, banking and entertainment services. But they rely on the network operator to charge the end user. Operators tend to be myopic towards the content providers in their pricing contracts, and thus reduce their incentive to continue to contribute value.

Pyle also states that bundle services are desired by service providers as a driver of increased average revenue per user (ARPU), and the ability to reduce churn. Mitch Clark, executive vice president of marketing operations for UPC Broadband, believes that successful bundles target lifestyles and give customers choice. At the same time, operators must communicate the benefits and value of the offering in simple terms. Clark suggested that simplicity includes the ability for customers to self-provision services and for customer service representatives to monitor systems that indicate the types of services customers have and might want (Pyle, 2006).

Finally, Pyle concludes that ultimately bundle services will not be enough for an operator to remain competitive. The key to future competitiveness will be the ability to continually add value to the bundle at competitive prices, and communicate that value to the customer.

Bernstein Research gives the following examples to articulate the concept of bundled services. Assume a consumer was shopping around for a new service plan. He/she is currently signed up to receive 1,000 minutes for \$39.99 and is potentially interested in data services. He/she might sign up for a \$34.99 plan that includes 2,500 minutes of voice service. However, if the consumer were offered 200 e-mails plus 2,500 minutes of voice service for \$39.99, then he/she is likely to accept the deal. While the consumer is likely to send fewer than 200 messages, he/she would feel glad to be getting a great \$.025-per message rate. As this example illustrates, bundling of services will prevent a decrease in ARPU.

In South Africa, ICASA, the communications regulator could help reduce the cost of mobile services further. On the supply side, they could create the competitive conditions that would pressure network operators to improve efficiency and keep prices down. Although they may not welcome such conditions, operators in general have an interest in persuading regulators to keep licence and spectrum fees low. Operators could also encourage the regulator to introduce better incentives for targeting low in-come groups. One such incentive could be the use of the universal-service fund.

ICASA could further reduce tariffs by cutting interconnection fees, the charges operators pay for using another operator's network to complete calls. This process has already started but is yet to be completed. However, this could result in greater growth of mobile subscribers, specifically prepaid subscribers, and hence a further decline in ARPU, as competitive and regulatory pressure builds.

3.9 Communication strategies to support product launch

Chen *et al.* refer to Hultink, Hart, Robben, & Griffin (2000), who claim that product launch is perhaps the most expensive, risky, and poorly managed phase of the new product development process, in the sense that firms must commit enormous time, financial and managerial resources, but the average failure rate is as high as 40% for consumer and industrial new products.

Chen *et al.* also refer to Guiltinan (1999), who says that a firm which is proficient in communicating the positioning of its new products and leveraging its affiliated brands may maximize its chances of achieving profitable product acceptance in the target market. They also refer to existing literature by Cooper & Kleinschmidt (1994) and Song & Parry (1994), which clearly supports the positive relationship between effective marketing communications and new product success.

Chen *et al.* further refer to Bridges *et al.* (2000), who says that marketing communications can be also classified as elaborational or relational, distinguished according to how the message contents are linked to the parent brand of a new extension product. They again refer to Aaker & Keller (1990), who point out that elaborational messages mainly address the product attributes of an innovation, and therefore represent a better communication strategy if the innovation is a new brand, or if it exhibits a low perceived fit with the parent brand.

Also, according to Chen *et al.* (Aaker & Keller, 1990; Bridges *et al.*, 2000), relational messages emphasize the relationship between the new product and its parent brand, which, assuming a high perceived fit helps transfer existing brand equity to the focal new product.

Also, as shown in Chen *et al.* (Phelps, Harris, & Johnson, 1996; Zahay, Peltier, Schultz, & Griffin, 2004), the way in which message contents are conveyed by the communications process is as imperative an element in marketing communications as the content. Accordingly, maintaining process quality

becomes a critical issue to ensure the effectiveness of marketing communications.

Chen *et al.* also refer to Schultz, Tannenbaum and Lauterborn (1993), who say that integrated marketing communications (IMC) advocates the alignment of communications to deliver a flow of consistent messages about a product or service. To meet a common set of communication objectives, every communication aspect must be executed in so unified a manner that information is clear and uniform, and thereby achieves the maximum impact on customers.

Research findings by Chen *et al.* show that in high-tech industries, what to say and how to say it are both essential for marketing communications designed to support a product launch. They propose that high-tech customers, who are relatively motivated and able to process new product-related information easily, may be better swayed by informational messages, which increase their awareness of, interest in, and comprehension of new products and lead to their adoption of the product.

The use of informational messages is more effective for launching high-tech products. Moreover, it is beneficial to use relational messages, which emphasize the association of the new product with its parent brand. Marketers can overcome adoption resistance by delivering messages that link products to their parent brands, which, if they possess strong brand equity, can generate customer trust and confidence in the new products.

The messages communicated to facilitate product launch should balance informational and relational elements, and the firm should make its informational and relational messages complementary, not mutually exclusive.

3.10 Integrated Billing Systems

The challenge for operators is to harness the revenue potential of the prepaid users as well as the post-paid ones. Any move towards saturation needs to be offset by the rapid development of payment-agnostic, next-generation offerings, coupled with a focus on optimizing the value of existing customers. To achieve this, “stovepipe” legacy environments must give way to convergent charging systems that can accommodate both pre-paid and post-paid accounts, and offer the flexibility to combine a variety of charging methods (Newcombe, 2004).

While challenging market climates have naturally focused operators' attention on achieving cost reductions and efficiencies, more operators are now looking to capitalize on growth opportunities. In broad terms, mobile operators are looking to drive growth via a two-pronged strategy. First they need to define, package and market services that are cleverly differentiated from those of competitors. Secondly, they are looking to increase average margin per user (AMPU) across the entire subscriber base, and optimise revenues over the long term (Newcombe, 2004). This will require the ability to segment the customer base, identify the highest margin users, and apply sophisticated targeting of services.

Many operators find themselves trying to compete in emerging markets for content, commerce and communication services using the same operational and business support systems. The fit between strategy and support technology, however, is no longer sufficient. Realigning a mobile business around a growth-led, customer-centric strategy requires the support of a fully convergent operational and business support system (Newcombe, 2004).

A fully integrated approach to pre-paid and post-paid accounts, which provides a single view of a customer's accounts, is essential to enable segmentation of the customer base and support next-generation applications and services.

The billing system needs to afford all users access to the full range of 2.5G and 3G services and promote credit management across services. Increasing ARPU

among pre-paid customers relies upon those subscribers having access to the same services, tariffs, marketing offers, incentives, customer care and roaming facilities that are available to post-paid subscribers (Newcombe, 2004:56). This also helps to simplify and to reduce the cost of marketing, operational costs, to manage credit and risk.

Customers accessing on-line services require instant pricing information. When a customer downloads a video clip, for instance, they need to be pre-advised of the total price they will pay, and the amount authorised against their account balance in real time (Newcombe, 2004:56).

Subsequently, if the content fails to download correctly, the customer's account needs to be topped up again in real time. Such functionality also enables operators to better manage their risk of revenue exposure. Operators need to closely monitor activities and the services they offer, not least in relation to high-value, low-margin services, which are potentially risky (Newcombe, 2004:56).

Operators will also need the ability to apply discounts across products and services in order to provide incentives to subscribers and reward particular usage patterns. The freedom to package services and apply discounts across different customer groups represents a chance to add value and help to push up ARPU (Newcombe, 2004: 57).

Services such as billing are proving critical to the success of mobile data services, but may require substantial investment to implement. China's Monternet service did not begin to take off until the operator had completed the painstaking task of upgrading each region's operations to accommodate the system's new billing requirements, and one of the reasons i-mode has not done as well in Europe is its inability to bill prepaid users, a significant proportion of the European subscriber base (Schenker, 2003).

Weiser's research (2007) on trailblazing companies shows that there are five key strategies for achieving success in these markets i.e. mine and translate local market information, adapt the business model to community realities, change internal incentives and challenge cultural assumptions, create partnerships and strategic alliances, and improve the enabling environment.

3.11 Quality of Service

Lim *et al.* (2006) state that to develop an effective loyalty program, it is imperative to understand the process of a consumer's loyalty decisions. Consumers' needs and value propositions vary across different types of products and service, and this must be taken into account.

Lim *et al.* refer to Zeithaml, Groenroos, McDougall & Levesque, who define quality and its dimensions. Quality is defined as the overall excellence or superiority that consumers perceive from a product or service (Zeithaml, 1988). Groenroos (1984) proposed two distinct service dimensions, technical and functional quality. Technical quality is what consumers get as the outcome of an interaction with a service provider, which is equivalent to core service quality – product/service-related offerings (McDougall and Levesque, 2000). In turn, functional quality has to do with how the service is delivered (Groenroos, 1984). In a service industry, where technical quality is difficult to differentiate among competitors, functional attributes of the service are potentially more important in customer satisfaction (Groenroos, 1984).

Technical aspects of mobile services include consumers' perceptions of pricing plans, network quality, and mobile data services; functional attributes comprise carriers' billing systems and customer service quality (Lim *et al.*, 2006:209).

Lim *et al.* also indicate that a positive relationship between service quality and perceived value is supported by a number of studies in service areas; that is, a

high level of perceived service performance leads to a high level of perceived value.

The findings of the study by Lim *et al.* show that each quality dimension has different effects on consumers' perceived value, satisfaction and loyalty intention. The perceived quality of operators' pricing offerings and data services are positively related to consumers' perceived economic value. Perceptions of functional quality (i.e. billing system, customer service quality) appeared to have a positive effect on consumers' perceived emotional value.

The quality of data services also increased perceived emotional value. Although network quality was not related to consumers' value perceptions, it increased the level of satisfaction significantly. Hence, satisfaction is influenced by the extent to which perceived quality exceeds or fails relative to pre-purchase expectations (Anderson and Sullivan, 1993). Therefore, customer service quality and quality of data services had direct impacts on customer satisfaction.

Customer satisfaction is an important factor for a long-term relationship between a firm and a customer (Anderson and Srinivasan, 2003). That is, a consumer's positive affect toward a service provider is likely to motivate the consumer to stay with the provider and also recommend the service to others (Zeithaml *et al.*, 1996).

While perceived value can be generated in any stage of consumption experience, without actual use of a product/service, satisfaction is aroused in a post-consumption stage, after an actual experience of a product or service (Sweeney and Soutar, 2001).

A consumer's feeling of belonging to a certain group may enhance perceived value. An empirical study found perceived social value increases the level of satisfaction in the use of mobile Internet services (Lee *et al.*, 2002).

The findings of the study by Lim *et al.* provide helpful guidelines for mobile service providers and/or operators in understanding key drivers of satisfaction and loyalty. This study identified five distinct service attributes of mobile service operators, and found that each attribute affects consumers' cognitive and affective responses differently. For example, the perceived quality of pricing plans has a positive effect on economic value; network quality on satisfaction; data service quality on economic value, emotional value, and satisfaction; the billing system on emotional value; and customer service quality on satisfaction. This suggests that, strategically, mobile service operators need to put an emphasis on certain service attributes in their promotions, based on targeting consumers' needs, economic value, emotional value, or service satisfaction. The finding also indicates that an enhanced quality of data services can provide mobile service providers and operators with competitive advantages over their competitors.

Thus, in general, the findings of the study by Lim *et al.* suggest that mobile service providers need to develop high quality data services as a powerful marketing tool. They also draw attention to emotional value in the consumption of mobile services. Significantly, it appears that emotional value plays an important role in customer satisfaction, and can affect loyalty.

The important thing is how services are provided, for example, how fast (speed), how cost-efficiently (price), and how well (quality). Operators should be focusing on how much margin they produce per service sold, and not on the amount of revenue they earn from each customer. The total cost of offering fast, cheap quality services must be taken into account, because an agile operator with small costs can actually make more margin than one with the highest ARPU.

3.12 Summary of Strategies

A report by Portio Research Limited (2006) also provides a list of strategies for different services that have been adopted by leading mobile network operators in Asia, Europe and the USA, and recommends best practices.

Strategies to be adopted include:

- Full-control over the Value Chain;
- Alliances with innovative Content Providers;
- Creating Brand Identity;
- Alliances with Handset Vendors, Content Providers and other players;
- A Unique Revenue Model;
- Flat Pricing Structure;
- Generous Revenue-Sharing with Content Providers;
- Reasonable pricing of Handsets;
- Technology Differentiator;
- Open-architecture Model;
- A Packet-Switch Network, providing an 'always-on' Connection;
- Choosing a simplified form of HTML;
- Marketing Initiatives, etc;
- Simplicity of usage;
- Wide availability of compatible handsets;
- Offering personalised content and a high level of interactivity;
- Flexibility of usage on multiple handsets;
- Open-Garden Approach;
- Handset Driven Portal Technology;
- Differentiating Services; and
- Free Service Usage in First Month of Subscription.

3.13 Summary of Best Practice Recommendations

The same report by Portio Research Limited summarizes best practice. It includes (2006; 134):

- Choice, Variety and Flexibility; Segment your market; Offer low cost services and transparent pricing; Focus on the brand; Innovation; Get smart with your services and your marketing; Make things useful, simple, easy and value for money in that order; Handsets; and, Look to Asia and learn.
- New services need to be promoted to different segments of the market in ways that appeal to those demographics, with something for everyone. By opening up the service to the widest possible audience, and segmenting customers with targeted marketing, maximum penetration can be achieved.
- It is essential to understand that prices will have to drop to rock bottom in order to drive many of these data services into widespread mass market use.
- Operators who do not already do this should look at bundling services together in discounted packages. These bundle prices and tariff packages need to be transparent and simple to understand. Consumers will quickly become upset by hidden charges and high download fee, thus pricing must be clear and event-based, not based on download time. A clear and simple price plan should offer the end-user a foolproof understanding of what each item costs, as many subscribers, especially those opting for prepaid tariffs, show greater use of services when pricing is simple, event-based and consistent.
- Operators should build partnerships with appropriate leading brands for each service, in order to offer best of breed content from well established, reputable sources. Partnering with top quality brands is most important in music, videos, ringtones, games, entertainment services, banking, retailing and any other services that are either fashion-related or involve handling consumers' own money.

- Operators can foster greater brand strength themselves through building the right alliances with content partners. Operators need to differentiate themselves through their services and content offerings, and here is one area where being first to market does seem to be a real advantage. Operators and brand/content owners should look for exclusive deals together, to create market strength through unique promotions and offerings; in the process, operators may see their brand strengthen in those segments of the market. Being first to market with an innovative new service, and backing it up with some clever marketing, can drive excellent results.
- As well as encouraging users to try a new service, remove any reason for them not to try that new service. MMS uptake was hampered by confusion over pricing, poor handset compatibility, lack of network inter-operability, and a complex user interface. Technical hurdles of this nature are almost guaranteed to stifle growth, and having learned these lessons already, there is no excuse for such mistakes to be replicated in the future.
- The key to the success of SMS is that it is, quite unequivocally, incredibly useful. It is also simple, cheap, easy, quick and discreet; but mostly, it serves a purpose that nothing else can perform in quite the same way. SMS is still the benchmark that other data services should strive to emulate.
- Mobility is all about convenience and lifestyle enhancement, and services which follow that profile – useful, simple, easy and value-for-money – cannot fail to attract hundreds of millions of users. Services must be designed to enhance and complement the user’s lifestyle, and not simply be offered because the technology is available to make it happen. In fact, the technology should be invisible to the end user, who invariably cares little for how or why something works, but just that it does.
- Extending the principle of simplicity, encourage the end-users themselves to contribute to creating the content they want. As new trends in the online world

see user-generated content proliferate, service providers should embrace this development and include new channels of user-generated content in their service portfolios. It is essentially a simple business model: let certain users create the content, and let other users download it. Add value in the middle by providing the service.

- Handset vendors must work in close partnership with network operators, with all parties working together for their common good and to ensure that the right handsets are available to the right people at the right time. When new mobile data services are launched, they must be supported by a wide choice of fully compatible new handsets, at affordable prices.

4 Chapter 4: Research Methodology

This chapter describes the methods that will be used in this research. The aim is to present the methods that will be used, and why they were chosen. The chapter also helps to give the reader an idea of how the research will proceed and be realised. In that respect, the methods and sources to be used for data collection are revealed.

The research strategy will be a combination of qualitative (secondary) research and quantitative (primary) research. Existing surveys, published journals, newspaper articles, online information, previously written reports about the industry and information generated by companies within it have been used to discuss the industry's background and general outlook.

Two survey questionnaires and interviews will be used to gather the primary data relating to the specific research, see appendix 9.1 and 9.2. Primary data collection is therefore structured into two phases which include structured interviews with different stakeholders from the industry and survey questionnaires to gather raw data which will be analysed to provide a better understanding of the problem and to form a firm basis out of which the conclusions will be drawn.

The first phase seeks to obtain information on the complementary relationship between network operators, content providers and WASP's, whereas the second phase seeks to gather the quantitative data about what subscribers and or customers think of the broadband data services on offer.

Theory will be used to understand the value net framework and revenue sharing issues associated with the critical role that complementors can play in influencing business success or failure. According to (Grant R. M, 2005: 103) the suppliers of complementary products play an important role in most firms' competitive

environment. This will be contextualised to the South African environment to establish what business models and strategies are relevant.

A survey will be used to gather data or acquire information about the groups characteristics, opinions, attitudes or previous experience (Leedy P.D and Ormrod J.E, 2005: 183) of the broadband multimedia services provided and whether it is what they want and if not which of their specific needs are not being addressed. The ultimate goal is to learn about a large population by surveying a sample of that population (Leedy P.D and Ormrod J.E, 2005: 183).

Structured Interviews will be used to determine why subscribers are not readily adopting the usage of data services as envisioned. The interview questions will be carefully planned and precisely worded to yield the kinds of data the researcher needs to answer the research question (Leedy P.D and Ormrod J.E, 2005).

The questionnaire with checklists and rating scales (Likert scales) will be specifically evaluated in terms of the reliability, validity, sensitivity and generalisability dimension to ensure that the researcher is getting consistent results from his measures, that he is indeed measuring what he thinks he is measuring, that his measure is able to capture the variability in responses and lastly that the scale used is applicable and interpretable in different research settings (Leedy P.D and Ormrod J.E, 2005). This will be done to ensure that the questions are simple and easy to understand so that good quality answers can be obtained.

The structured questionnaires will be a combination of both open ended and closed questions to identify the shortcomings of the present broadband data services and identify why besides all the hype the services have not met with expectation. Interviews with stakeholders specifically key executives from the three mobile network operators, WASPs, content providers and handset suppliers will be used to determine the strategies used to drive the demand for

their data services and their shortcomings thereof. A list of some of the people that will be interviewed is given in table 4.1.

Questionnaires will be e-mailed to the following:

- The Engineering Group, Product and Services, and Customer Care/Call Centre colleagues at Vodacom, who will also be asked to forward the questionnaire to their colleagues and friends (snowball effect).
- Friends at MTN and Cell-C, who will be asked to forward it to their companies' Call Centre Divisions (snowball effect).
- Most of the people for whom I have e-mail addresses; I will also ask them to forward it to colleagues and friends (snowball effect).
- My wife, who will be requested to forward the questionnaire to her colleagues at the Industrial Development Corporation (snowball effect).
- My former colleagues at ICASA; I will also ask them to forward the questionnaire to their colleagues and friends (snowball effect).

About one hundred and fifty copies will be printed and given to four students who will distribute them at Tshwane University Technikon, WITS University, University of Pretoria and PC Training and Business College

Another fifty copies will be given to the Vodacom security staff and to some cafeteria staff at Vodacom to complete and to distribute in Rabie Ridge and other townships.

The other questionnaires will be e-mailed to more than fifty service providers/WASPs through a distribution list obtained from a colleague at Vodacom.

The sample size will be between 200 to 250, comprising a random number of current and potential users of cellular phones, network operators, service providers and WASPs in Gauteng.

The scientific research methods outlined above were chosen because they are a means of gaining insight into the unknown by identifying a problem that defines one's quest and positing a hypothesis that, if confirmed, resolves the problem. After gathering data relevant to the hypothesis, it is analyzed and interpreted to see whether or not it supports the hypothesis and resolves the question that initiated the research (Leedy P.D and Ormrod J.E, 2005: 33).

Permission for doing research will be sought in advance through the submission of a letter of introduction from the Graduate School of Business Leadership to companies, organisations and/or people in the Gauteng Province. This letter will describe how the research will be conducted, and outline in precise detail the resources which the researcher will use in order to gain active and maximum participation from staff – without any fears of victimisation – in the hope of achieving the desired results.

In general, the aim of the quantitative and qualitative research is to gather information that will provide a better understanding of the problem, and to form a firm basis out of which the conclusions will be drawn.

5 Chapter 5: Research results

5.1 Sample Description

The findings of the questionnaire are shown in this section. Two different types of questionnaires were e-mailed and faxed to individuals and to Content Providers, Wireless Application Service Providers (WASPs) and the three Mobile Network Operators (Cell-C, MTN and Vodacom). In all, 245 people and 9 companies responded to the questionnaire.

The first questionnaire was divided into three sections, covering the following:

1. The profile of the respondent.
2. The demand and awareness of mobile data services.
3. The reliability, affordability and ease of use of mobile data services.

The second question covered the strategic partnership between Mobile Network Operators, Content Providers and Wireless Application Service Providers.

5.1.1 The Profile of Respondents

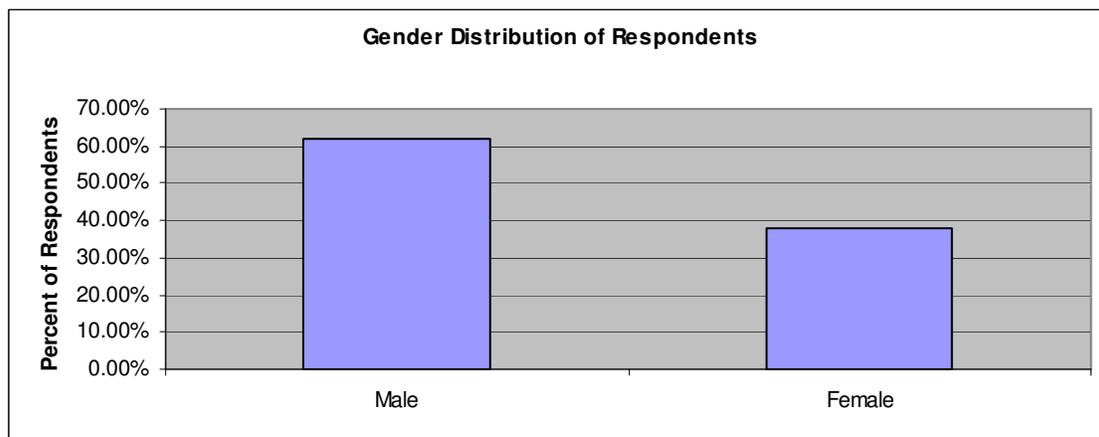


Figure 5.1: Gender distribution of respondents

Sixty two percent of the total respondents were male and thirty eight percent were female. This means that conclusions made on male respondents will tend to be more precise than those made on female respondents.

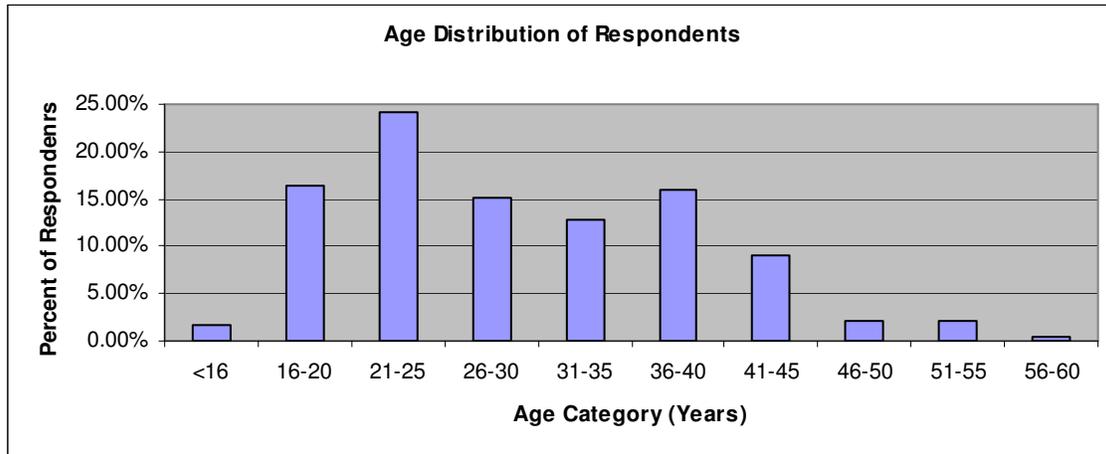


Figure 5.2: Age distribution of respondents

Ninety four percent of the respondents were between the ages of sixteen and forty-five. When investigating associations of age group with other variables, respondents below the age of 16 years and those above the age of 45 years will not be considered, as these together constitute only about six percent of the total sample.

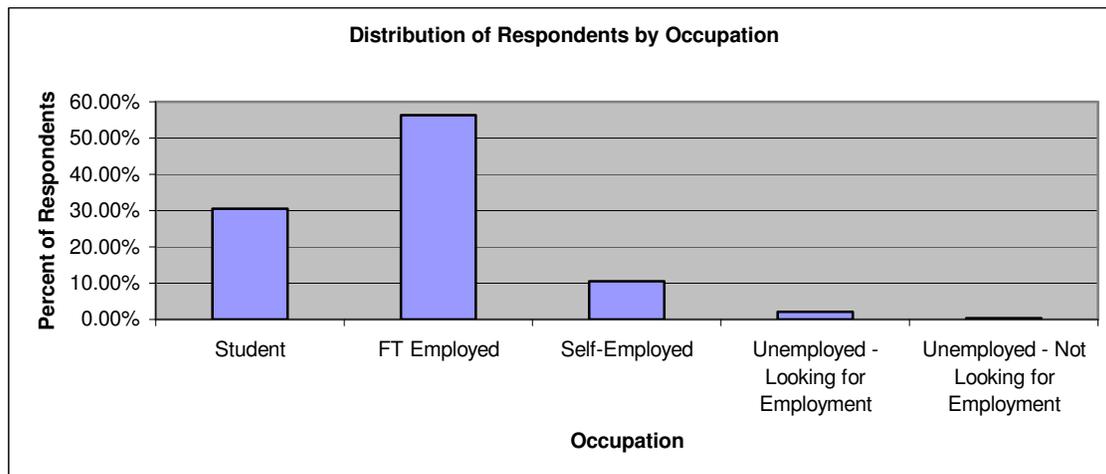


Figure 5.3: Distribution of respondents by occupation

Eighty-six percent of the respondents were either students, who constituted thirty percent or full-time employees, who constituted fifty-six percent of the sample. Joint distributions involving the respondents' occupation will be performed, using only these two groups (full-time employed and student).

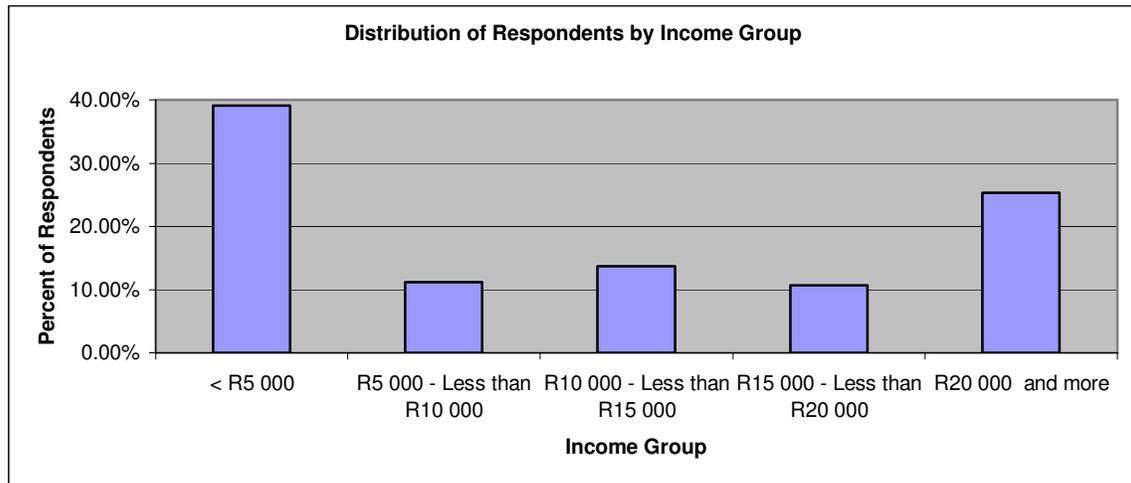


Figure 5.4: Distribution of respondents by income group

Thirty-nine percent of those who responded earned below R5 000 per month, followed by those earning R20 000 and more, who constituted twenty-five percent. There are an approximately equal number of respondents in each of the income brackets: “R5 000 to less than R10 000”, “R10 000 to less than R15 000”, and “R15 000 to less than R20 000”.

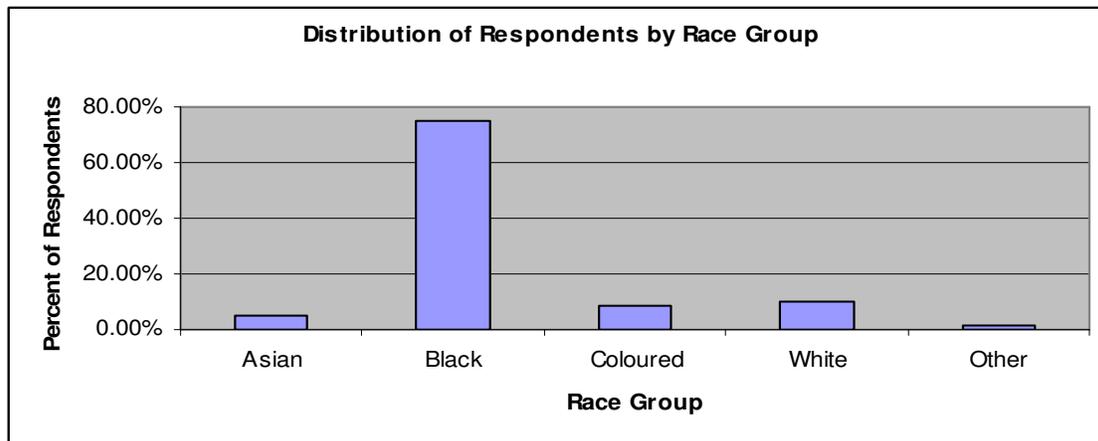


Figure 5.5: Distribution of respondents by race group

Seventy five percent of the respondents were Blacks, four percent were Asians, eight percent were Coloureds, ten percent were Whites, and Other constituted one percent. A joint distribution involving race group will therefore not be performed because there is little information on race groups other than Blacks.

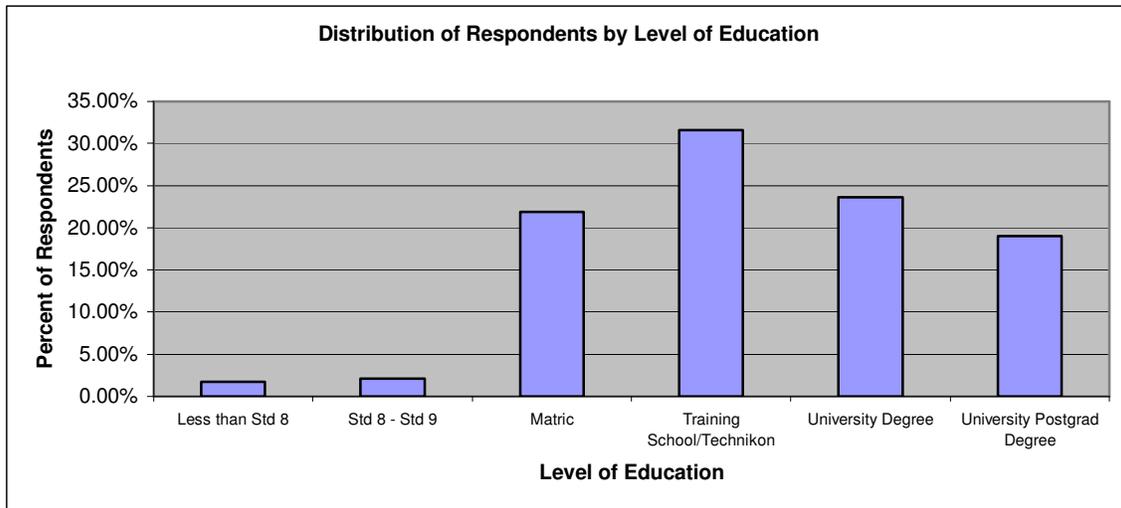


Figure 5.6: Distribution of respondents by level of education

Ninety-six percent of the respondents had educational qualifications ranging from matric to university postgraduate diploma. Only four percent had educational qualifications below matric. When looking at joint distributions with level of education, therefore, only those with matric and above will be considered.

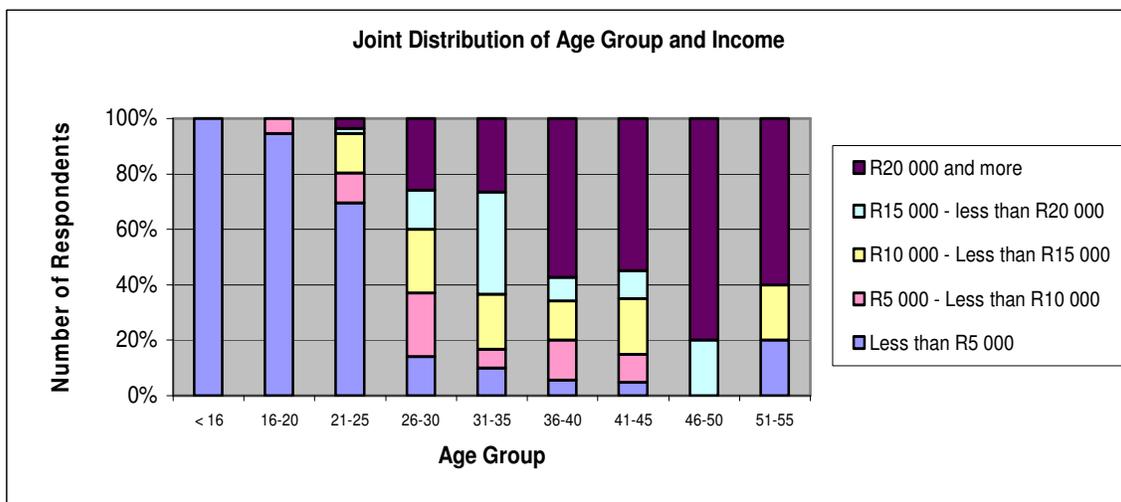


Figure 5.7: Joint distribution of age group and income

Table 5.1: Chi-squared of association between age group and income

Chi-squared	df	Probability
183.3131	40	0.0000

The small p-value (0.0000) for the Chi-squared test of association shows that there is a high association between age group and level of income.

This is because those with lower income tend to be in the lower age groups and those with higher income tend to be in the higher age groups. Therefore, it will not be necessary to use both age group and income group in the analysis of the responses. One of the two will suffice.

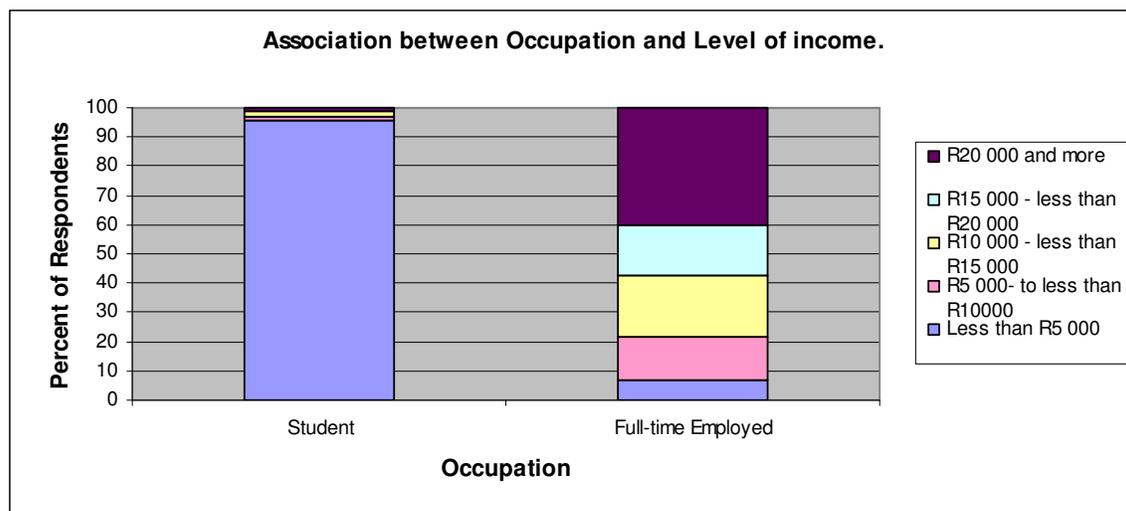


Figure 5.8: Association between occupation and level of income

Table 5.2: Chi-squared of association between occupation and income

Chi-squared	df	Probability
153.5366	4	0.0000

The small p-value (0.0000) for the Chi-square test of association shows a high association between occupation and income level.

Most of the students fall in the income level less than R5 000 while most of the full-time employed earn an income above R5 000 per month. This means, therefore, that it will not be necessary to investigate the joint distributions of both occupation and income level. One of the two will suffice.

5.1.2 The Demand and Awareness of Mobile Data Services

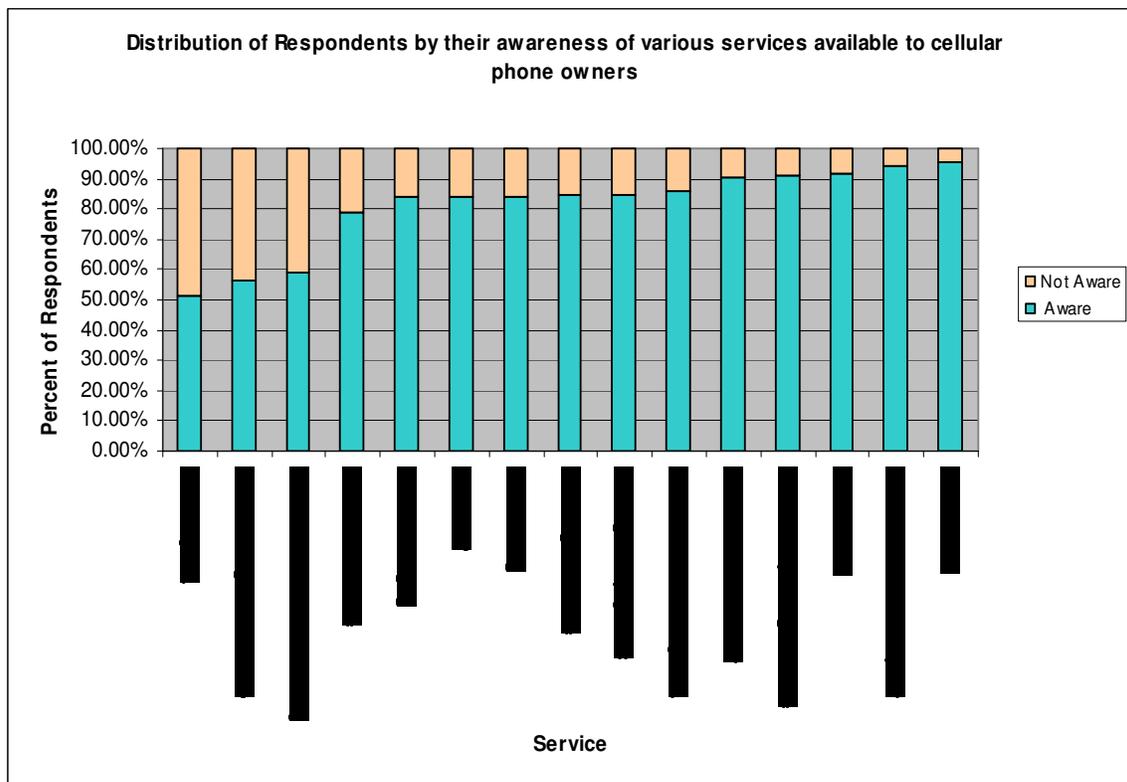


Figure 5.9: Distribution of respondents by their awareness of various services available to cellular phone users

Forty-eight percent of the respondents were not aware of telematics and telemetry as services whereas fifty one percent of the respondents were aware of these services.

Forty-four percent of the respondents were not aware that one can use a cellular phone for stock trading and m-Commerce, whereas fifty-seven percent of the respondents were aware of this service.

Forty-one percent of the respondents were not aware that one can use a cellular phone for credit card authorisation and to play the lottery, whereas fifty-nine percent of the respondents were aware of these services.

Seventy-nine percent of the respondents were aware of chat services like Mxit, Facebook etc. whereas twenty-one percent of the respondents were not aware of these services.

Eighty-four percent of the respondents were aware of services such as video messaging, video calling, mobile television, mobile gambling, downloading jokes, mobile banking, accounts payment and accessing information and directory services, whereas sixteen percent were not aware of these services.

Ninety-one percent of the respondents were aware that one could do balance inquiry, airtime transfer, send/receive and download pictures, clips, ringtones, access the Internet, and send and receive e-mail with a cellular phone, whereas nine percent were not aware of these services.

Ninety-six percent were aware of SMS & MMS, whereas four percent were not aware of these services. (Note: I am assuming that it is MMS and not SMS that the respondents are not aware of; but because the two were grouped together they could not indicate that it is in fact MMS that they were referring to).

Ninety-four percent of the respondents were aware that one could access the Internet using a laptop mobile Internet on computer, whereas six percent were not aware. Here again it is possible that respondents might have thought that a computer refers to a fixed terminal/desktop and not a mobile terminal/laptop.

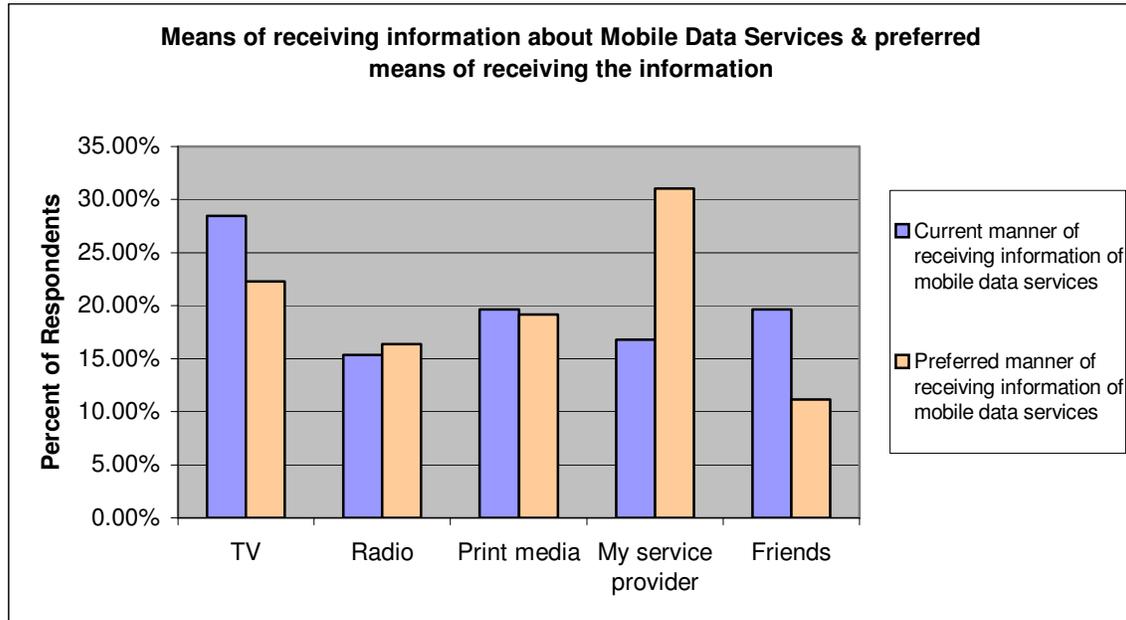


Figure 5.10: Current and preferred means of receiving the information about mobile data services

The graph above shows that thirty-four percent of respondents would prefer to receive information about mobile data services through their service providers.

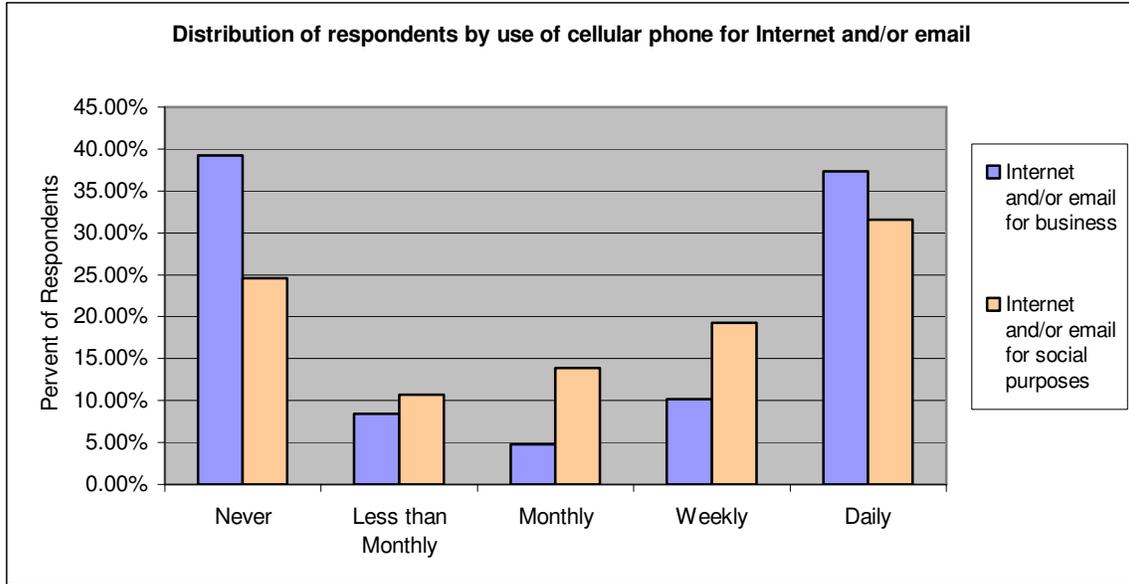


Figure 5.11: Distribution of respondents by how they use the cellular phone for Internet and/or e-mail

The graph above shows that about forty percent of the respondents have never used the cellular phone to access the Internet or send and receive e-mail for business purposes. About twenty-five percent have never used the cellular phone to access the Internet or send and receive e-mail for social purposes. However, between thirty and forty percent of the respondents said they access the Internet or send and receive e-mail for both business and social purposes.

Table 5.3: 95% confidence limits for business and social use

	95% Conf Limits			95% Conf Limits	
Never	31.70%	47.00%	Never	18.60%	31.40%
< Monthly	4.70%	13.70%	< Monthly	6.70%	16.00%
Monthly	2.10%	9.30%	Monthly	9.30%	19.70%
Weekly	6.10%	15.90%	Weekly	13.90%	25.60%
Daily	30.00%	45.20%	Daily	25.00%	38.70%

The table above shows that there was no difference among respondents (at the 0.05 level of significance) between business use and social purposes in the daily use of the cellular phone for Internet and/or e-mail (See the 95% confidence limits).

Table 5.4: Chi-squared of association between Internet/e-mail and income

Chi-squared	df	Probability
26.9659	16	0.0419

The table above, depicted graphically below, shows that there is association (p-value = 0.05 or at the 0.05 level of significance) between level of income and frequency of use of the cellular phone for Internet and/or e-mail.

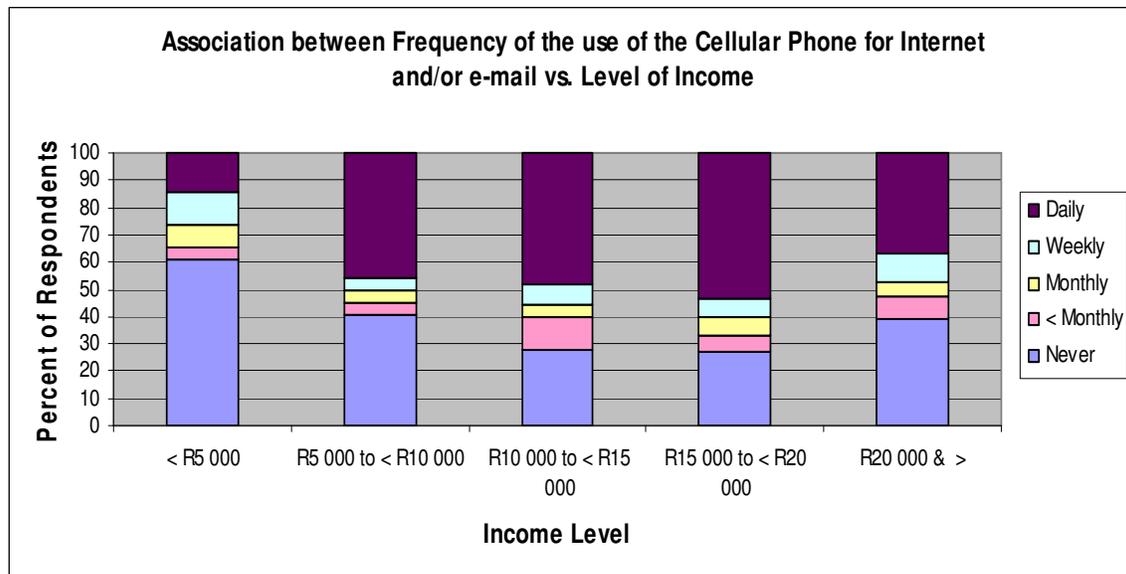


Figure 5.12: Association between frequency of use of the cellular phone for Internet and /or e-mail versus the income level

For income levels less than R20 000, the overall use, and in particular the daily use, of the cellular phone to access the Internet and/or e-mail tends to increase with an increase in the level of income. On the other hand, the proportion of those who never use the cellular phone to access the Internet and/or e-mail tends to decrease with an increase in the level of income. However, this trend does not continue for income levels above R20 000.

This could be because those that get high incomes tend to be senior in their organisations and would most likely have access to other means of accessing the Internet and or e-mail e.g. by using laptops and data cards.

Table 5.5: Chi-squared of association between Internet/e-mail and income

Chi-squared	df	Probability
26.7144	16	0.0448

The table above, depicted graphically in the table below, shows that there is association (p-value = 0.05 or 0.05 level of significance) between level of income and daily use of the cellular phone for Internet and/or e-mail for social purposes.

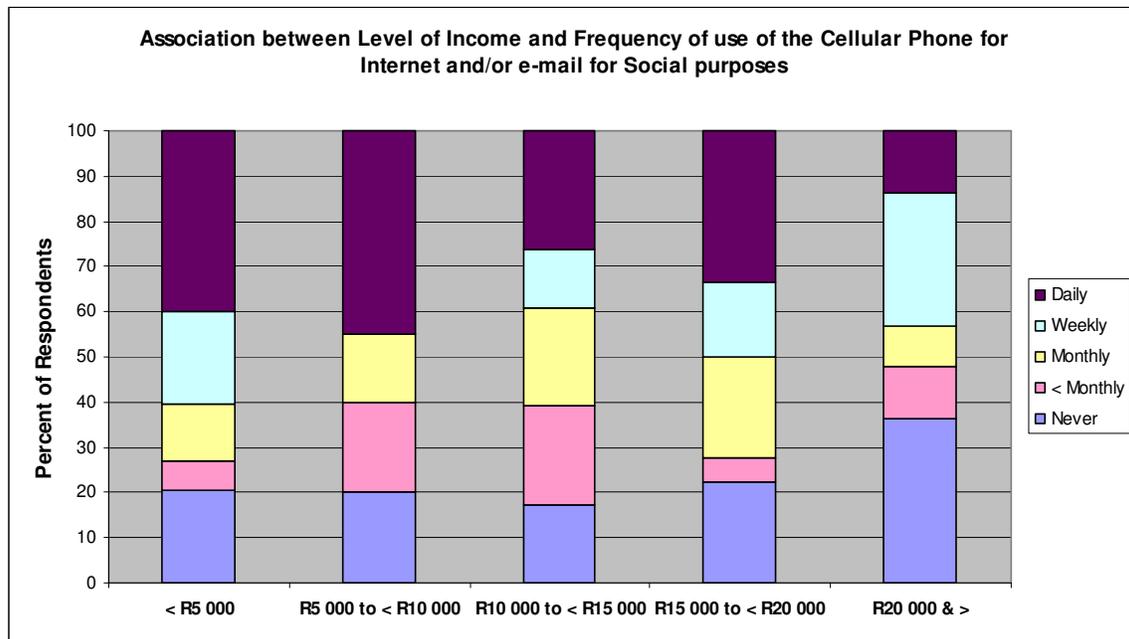


Figure 5.13: Association between level of income and frequency of use of the cellular phone for Internet and/or e-mail for social purposes

Generally, the daily usage of a cellular phone to access the Internet and/or e-mail for social purposes tends to decrease with the increase in level of income.

Again, this could be because those who receive high incomes tend to be senior in their organisations and would most likely have access to other means of accessing the Internet and or e-mail e.g. by using laptops and data cards or desk tops.

The other reason could be because the majority of the respondents are students and hence for them the easiest way of accessing the Internet is through their

cellular phones, as opposed to people in formal employment, who have the option of using their laptops or desktops.

The following graph gives a distribution of reasons why those who use mobile broadband Internet services signed up.

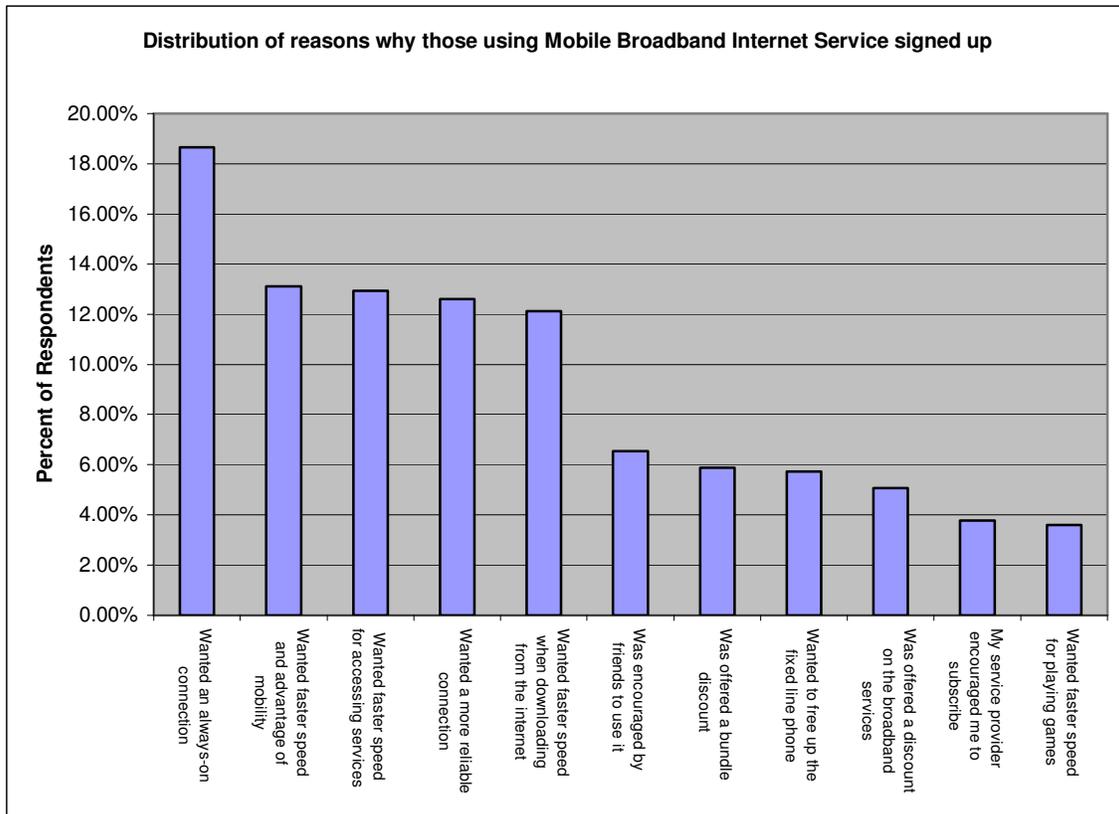


Figure 5.14: Distribution of reasons why those that use mobile broadband Internet service signed up

In general, the major reasons why respondents signed up for mobile broadband Internet services were that they wanted an always-on connection anytime anywhere, as well as faster speed when accessing e-mail or other services and when downloading data from the Internet. Lastly, they value the advantage of mobility.

The following graph represents the distribution of respondents by reasons for which they would use mobile Internet and/or email on a cellular phone.

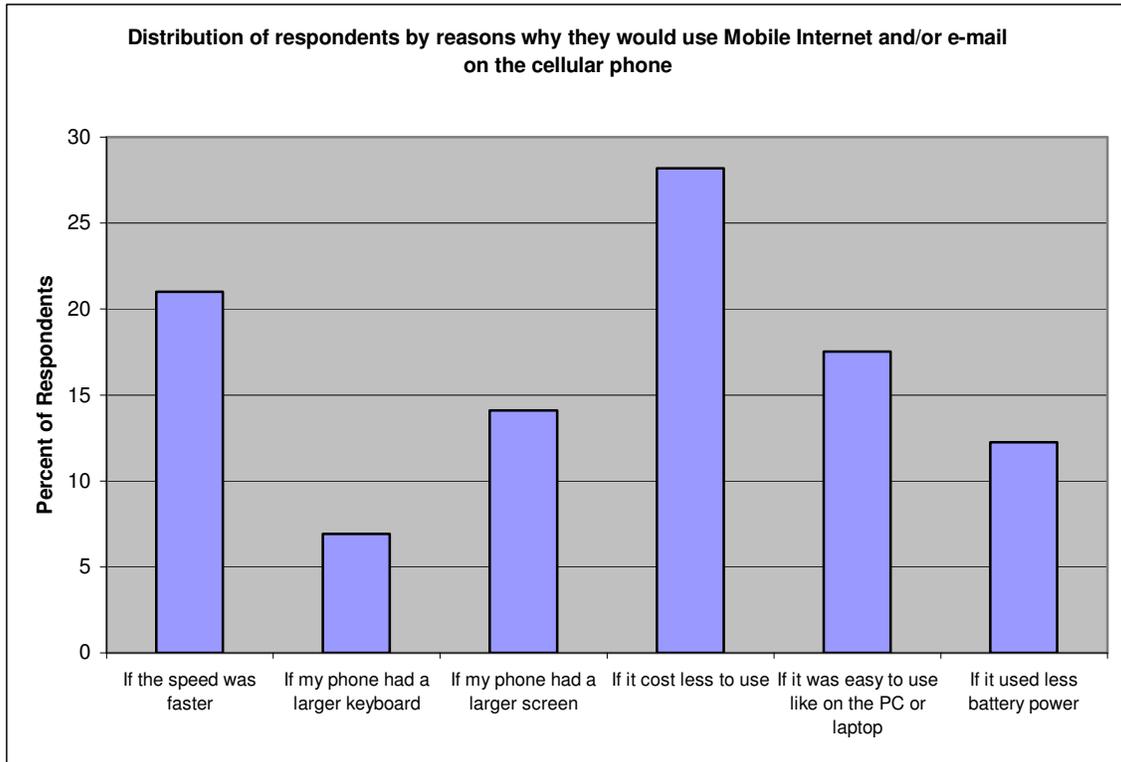


Figure 5.15: Distribution why respondents would use mobile Internet and/or e-mail on a cellular phone

Twenty-eight percent of respondents said they would use the service if it cost less to use.

Twenty-one percent said they would use the service if the speed were faster. Eighteen percent said they would use the service if it were easy to use, as on the PC or a laptop.

Fourteen percent said they would use the service if the cellular phone had a larger screen.

Twelve percent cited battery power and seven percent wanted a larger keyboard.

In general, aesthetics and battery power are not important to most respondents; most of them are more concerned about cost, speed and ease of use.

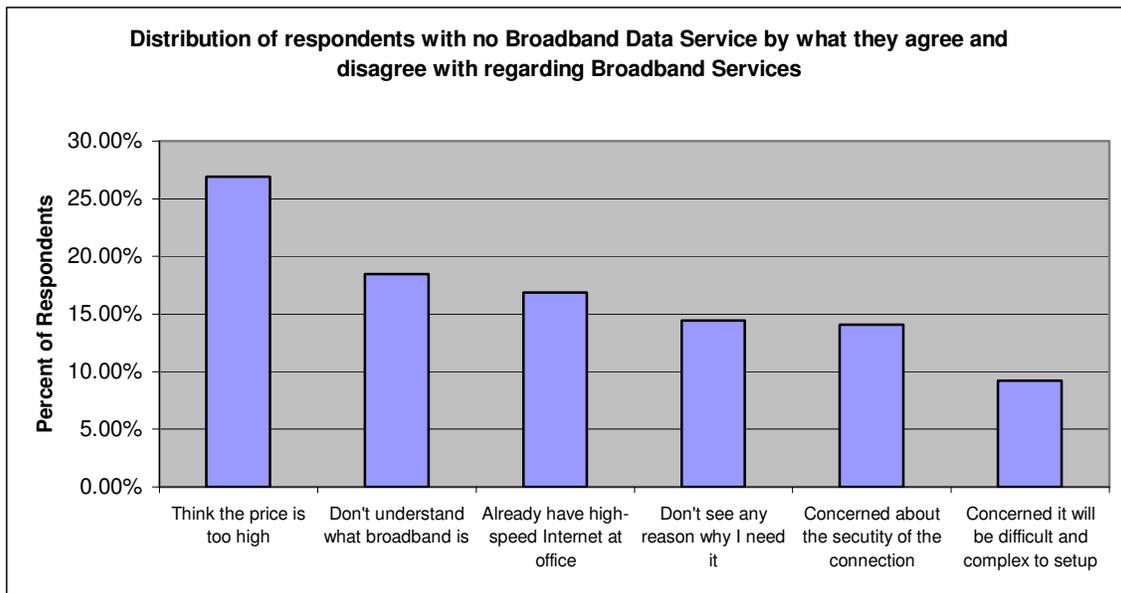


Figure 5.16: Distribution of respondents with no broadband data service by what they agree and disagree with regarding broadband services

Twenty-seven percent of respondents thought that the price of mobile broadband services was too high.

Nineteen percent did not understand what broadband is.

Fourteen percent were concerned about the security of the connection, while nine percent were concerned that it would be difficult and complex to set up a cellular phone to access broadband services.

Here again, price emerges as a major concern. This shows that there is a need for educational campaigns about mobile data services and their benefits, and a need to address concerns about security and the difficulty and/or complexities of setting up cellular phones for these services.

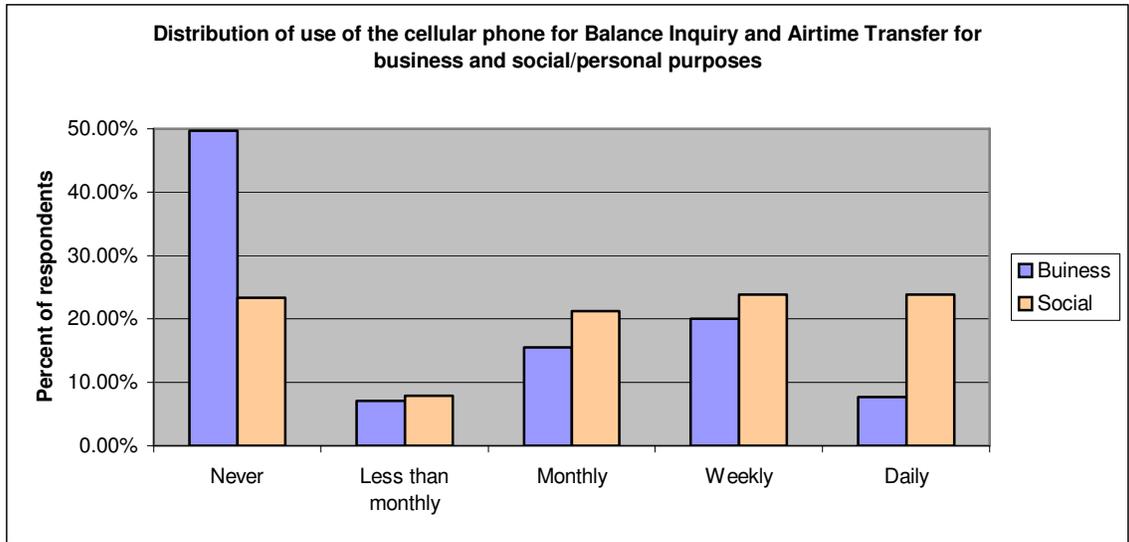


Figure 5.17: Distribution of use of the cellular phone for balance inquiry and airtime transfer for business and social/personal purposes

Fifty percent of the respondents use the cellular phone for balance inquiry and airtime transfer for business purposes, whereas twenty-three percent use it for social purposes.

The assumption here is that this large percentage of people who use the balance inquiry and airtime transfer for business purposes are those that use the cellular phone to pay their bills or make purchases, and that most of the time they check their balance before they transact.

There is no association between those using the service for business purposes and income level.

Table 5.6: Chi-squared of association for balance inquiry and airtime transfer

Chi-squared	df	Probability
63.2577	16	0.0000

The table above shows that there is a high association between level of income and daily use of the cellular phone for balance inquiry and airtime balance (p-value = 0.0000). This is depicted graphically below:

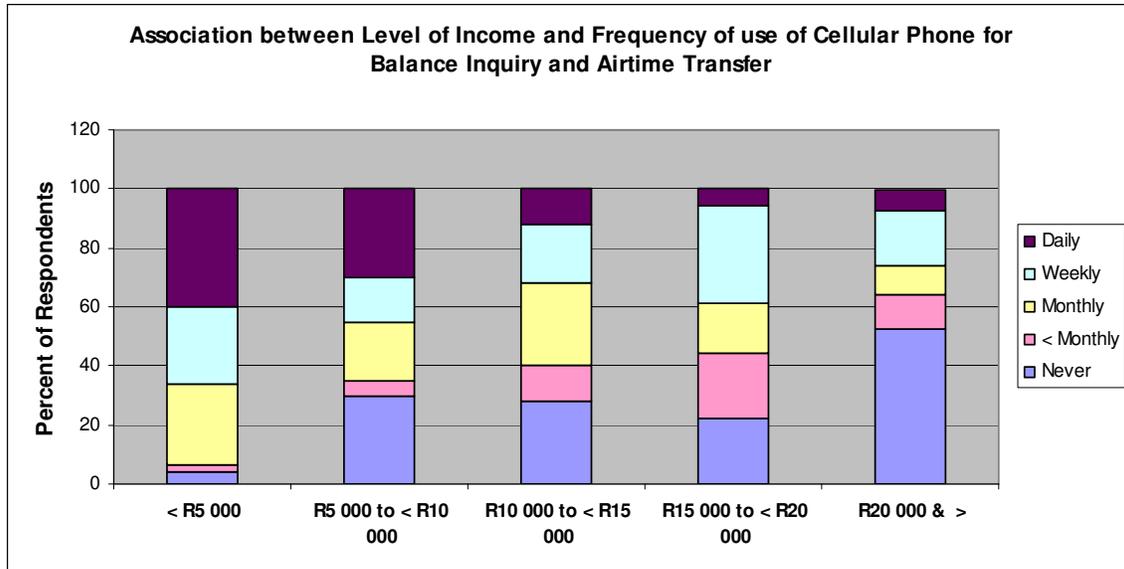


Figure 5.18: Association between level of income and frequency of use of the cellular phone for balance inquiry and airtime transfer

The graph above shows that the daily use of a cellular phone for balance inquiry and airtime transfer tends to decrease with an increase in the level of income. This is most probably due to the fact that those in the lower income level are cost sensitive, and they tend to check their balance fairly frequently; they also tend to load up small amounts of airtime, thus increasing the frequencies of balance inquiries and airtime transfers.

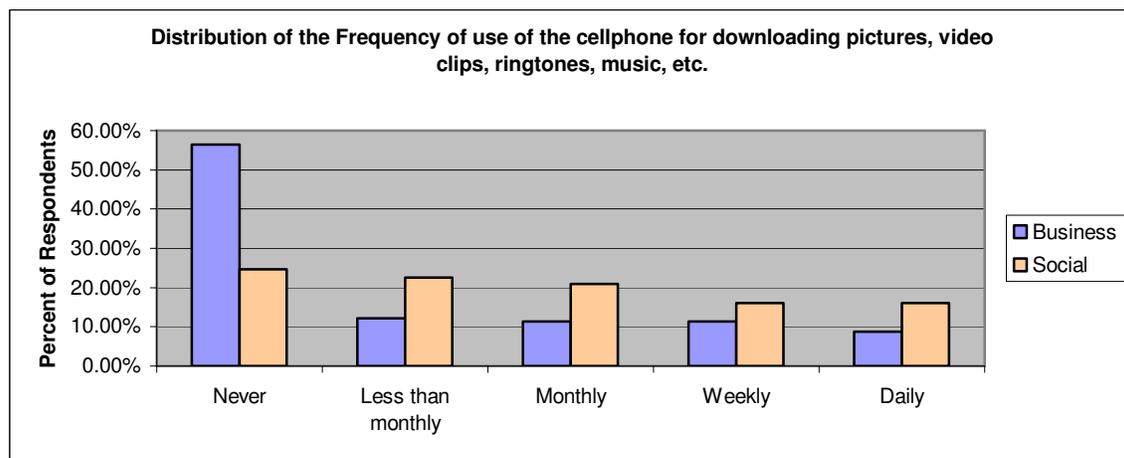


Figure 5.19: Distribution of the frequency of use of the cellular phone for downloading pictures, video clips, ringtones, music, etc.

The graph above shows that the use of the cellular phone for downloading pictures, video clips, ringtones, music, etc. is higher for social purposes than for business purposes.

This could be because downloading most of these services would very seldom have anything to do with work; most of the time downloading them would have to do with a social and/or personal matter, and would therefore not be work-related.

There is no association between those using the service for business purposes and income level.

Table 5.7: Chi-squared of association between ringtones etc and income

Chi-squared	df	Probability
71.0293	16	0.0000

The table above shows that there is a high association between level of income and daily use of the cellular phone for downloading pictures, video clips, ringtones, music, etc (p-value = 0.0000). This is depicted graphically below:

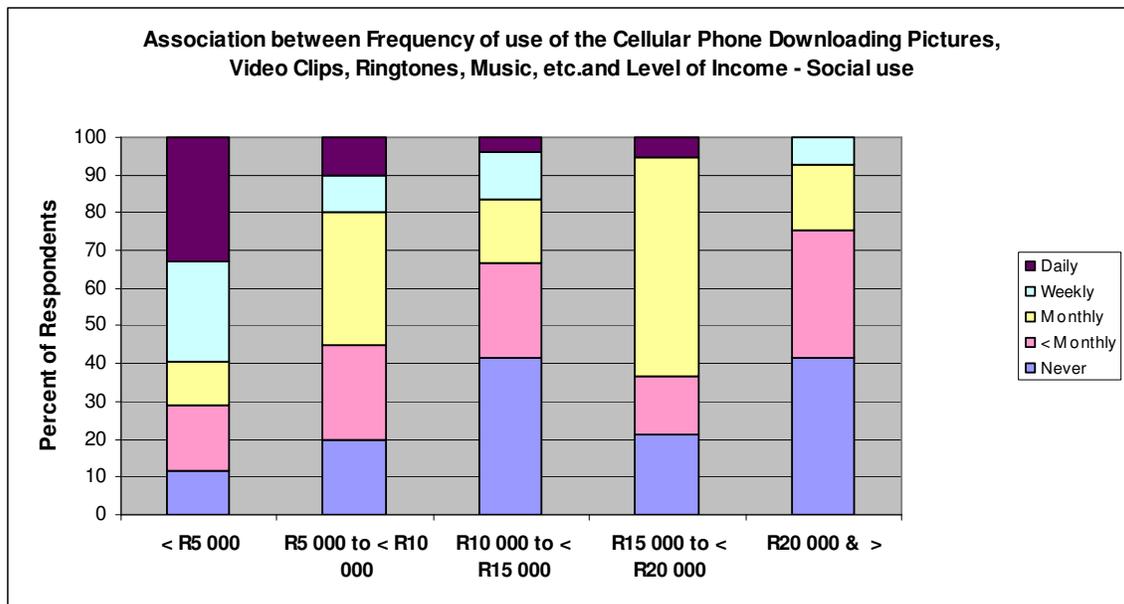


Figure 5.20: Association between frequency of use of cellular phone for downloading pictures, video clips, ringtones music etc for social use and income level

The graph above shows that the daily use of the cellular phone for downloading pictures, video clips, ringtones, music, etc. tends to decrease with an increase in the level of income.

This could be because those in the high income group are more pre-occupied or busy with work related issues during the day and/or week, and therefore do not have the time to be downloading pictures, video clips, ringtones and music.

These services are, however, used by all income groups. Those that have never used the service could be the laggards who are always late in adopting any new technology and or services and therefore with the right marketing and communication strategies they could represent a potential for growth in all the income groups.

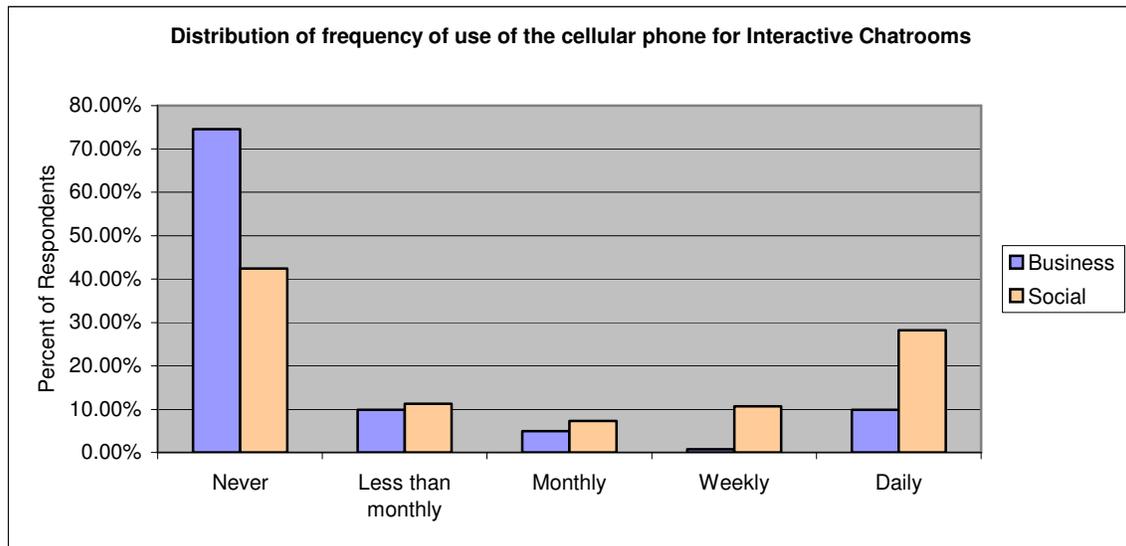


Figure 5.21: Distribution of frequency of use of the cellular phone for interactive chat rooms (Mxit, Facebook etc)

There is no association between those using the interactive chat service for business purposes and income level.

Table 5.8: Chi-squared of association between chat rooms and income

Chi-squared	df	Probability
68.9695	16	0.0000

The table above shows that there is high association between the frequency of use of the cellular phone for interactive chat rooms and level of income (p-value = 0.0000). This is depicted graphically below:

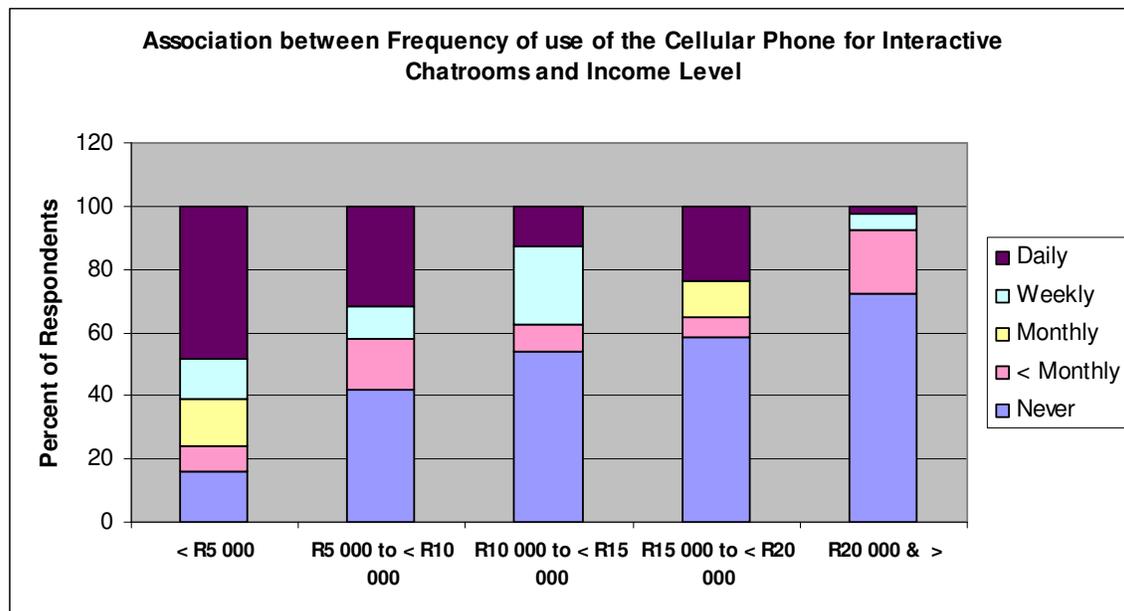


Figure 5.22: Association between frequency of use of cellular phone for interactive chat rooms and income level

The graph above shows that the overall use of chat rooms tends to decrease with an increase in the level of income.

Again, this could be because those in the high income group are more pre-occupied or busy with work-related issues during the day and/or week and therefore do not have the time for chat rooms. Also, because they earn a lot of money they are likely to call their friends, colleagues, relatives and other people than communicate with them via SMS or chat rooms.

These services are however used by all income groups. Those that have never used the service could be the laggards who are always late in adopting any new technology and/or services, and therefore with the right marketing techniques they could represent a potential for growth in all the income groups.

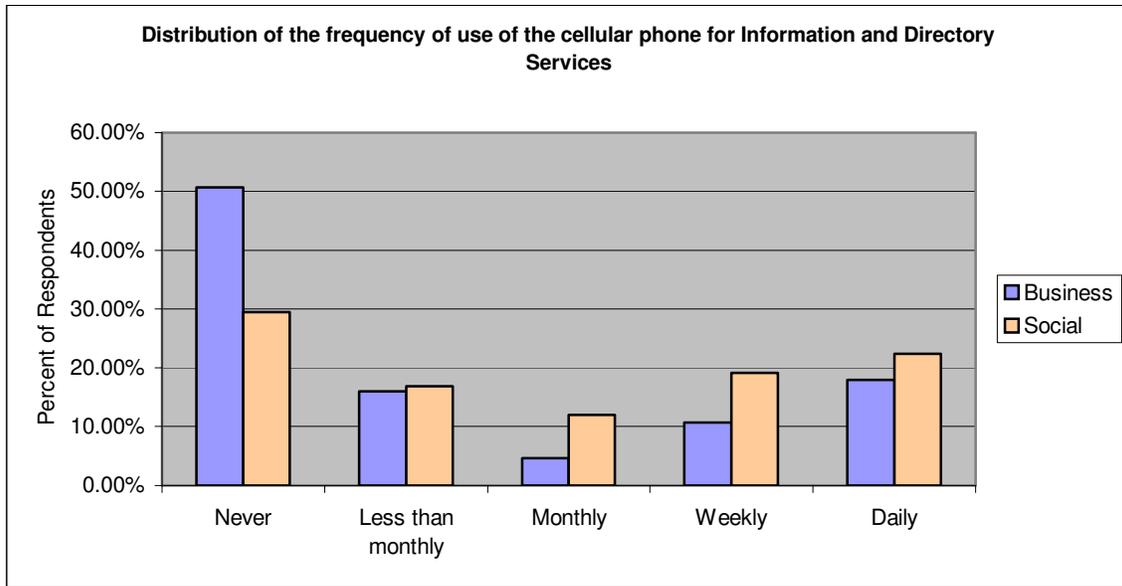


Figure 5.23: Distribution of the frequency of use of the cellular phone for information and directory services

This graph shows that most respondents use the cellular phone for information and directory services more for social purposes category than for business purposes.

There is no association between those using the service for business purposes and income level.

Table 5.9: Chi-squared of association between directory services and income

Chi-squared	df	Probability
28.3615	16	0.0286

There is a high association between the daily use of the cellular phone for information and directory services and income level (p-value = 0.0286). This is depicted graphically below:

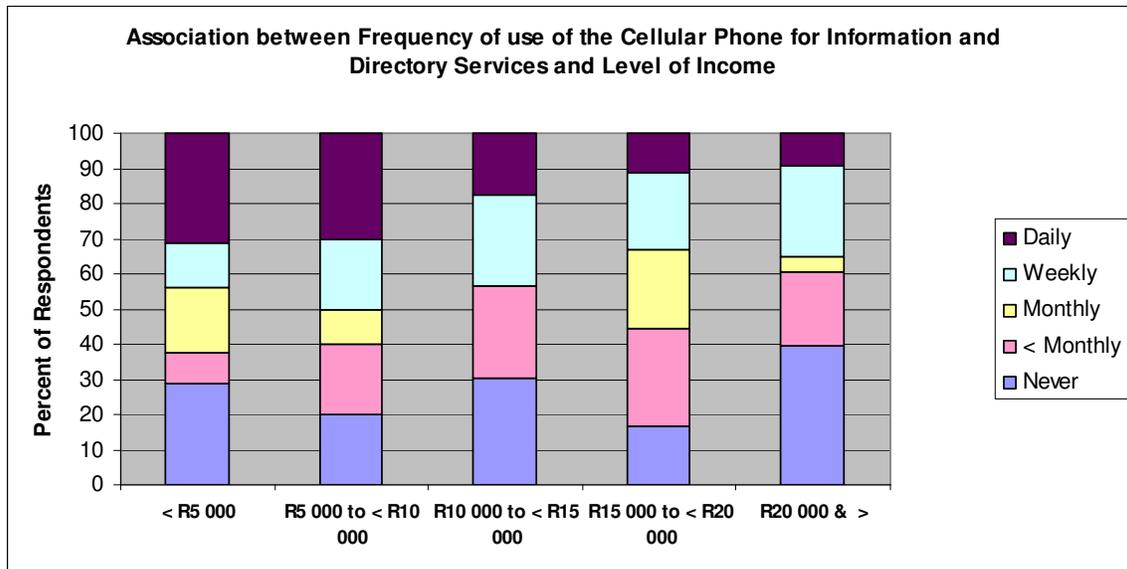


Figure 5.24: Association between frequency of use of the cellular phone for information and directory services and level of income

The graph above shows that the daily use of the cellular phone for information and directory services tends to decrease with level of income. However, there does not seem to be any association between level of income and the proportion of those who utilize the service.

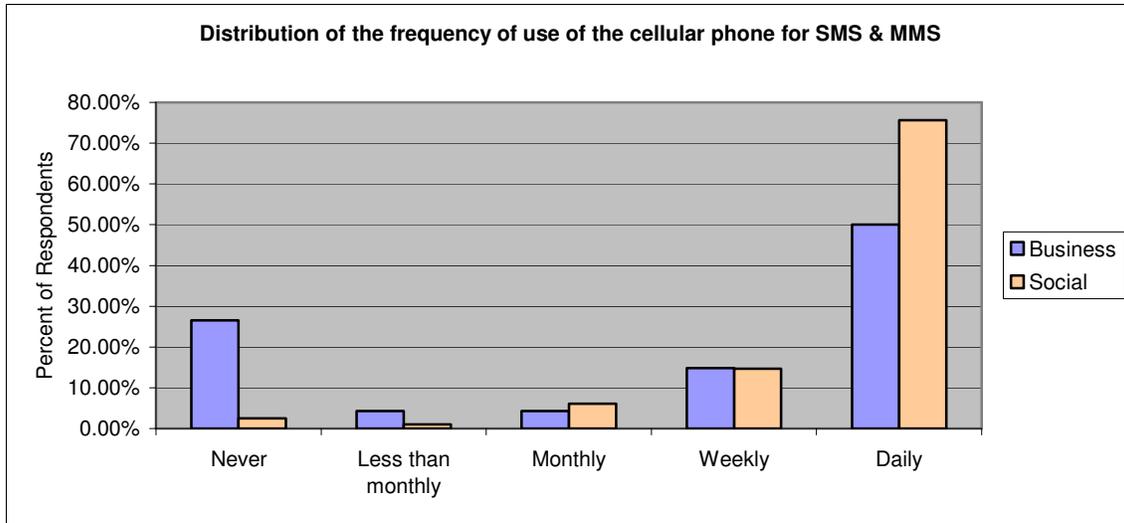


Figure 5.25: Distribution of the frequency of use of the cellular phone for SMS & MMS

The graph above shows that almost everybody interviewed used SMS and MMS for social purposes. The service was also used by a significant proportion of respondents for business purposes.

The table below shows the distributions of the respondents who are aware of the use of the cellular phone for video messaging and video calling for business use.

Table 5.10: 95% confidence limits for video messaging etc - business use

Video Messaging (Business use)	Frequency	Percent	Cum Percent	Video calling	Frequency	Percent	Cum Percent
Never	89	69.00%	69.00%	Never	95	73.60%	73.60%
< monthly	17	13.20%	82.20%	< monthly	8	6.20%	79.80%
Monthly	8	6.20%	88.40%	Monthly	11	8.50%	88.40%
Weekly	10	7.80%	96.10%	Weekly	10	7.80%	96.10%
Daily	5	3.90%	100.00%	Daily	5	3.90%	100.00%
Total	129	100.00%	100.00%	Total	129	100.00%	100.00%

	Frequency	Percent
1	60.30%	76.80%
2	7.90%	20.30%
3	2.70%	11.90%
4	3.80%	13.80%
5	1.30%	8.80%

	Frequency	Percent
1	65.20%	81.00%
2	2.70%	11.90%
3	4.30%	14.70%
4	3.80%	13.80%
5	1.30%	8.80%

At the 0.05 level of significance, the distributions are similar except for the category of those who use the service less than monthly (see the 95%

confidence limits). These distributions are depicted pictorially in the diagram below.

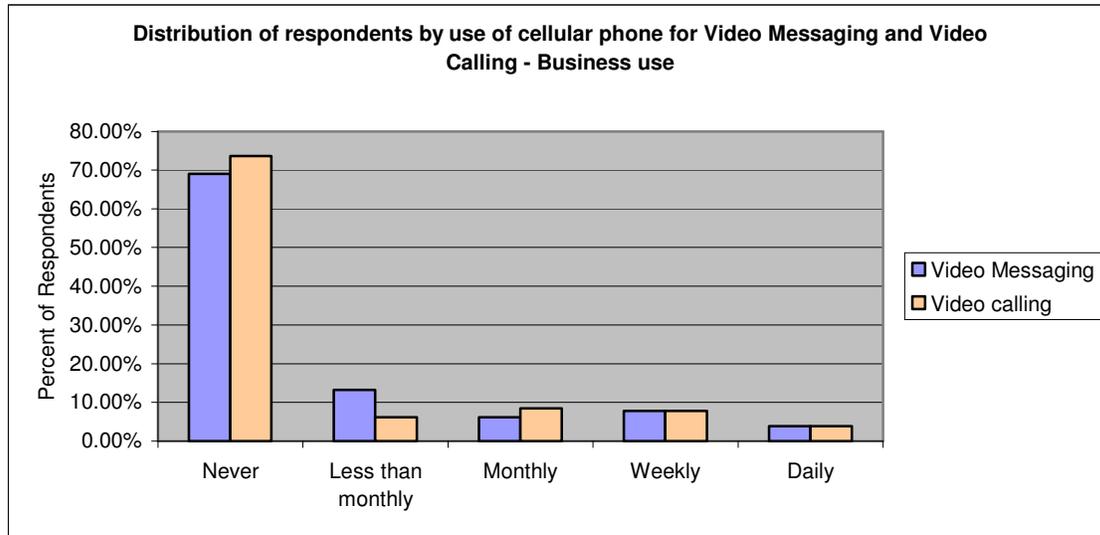


Figure 5.26: Distribution of respondents by use of cellular phone for video messaging and video calling

Most of the respondents were aware of video messaging and video calling but they never use this service.

Joint distributions are not possible because there are not enough observations for cell counts among those who use the services for business purposes.

Table 5.11: 95% confidence limits for video messaging etc – social use

MMS (Social use)	Frequency	Percent	Cum Percent
Never	68	41.00%	41.00%
< monthly	33	19.90%	60.80%
Monthly	20	12.00%	72.90%
Weekly	17	10.20%	83.10%
Daily	28	16.90%	100.00%
Total	166	100.00%	100.00%

MMS (Social use)	Frequency	Percent	Cum Percent
Never	82	49.40%	49.40%
< monthly	28	16.90%	66.30%
Monthly	18	10.80%	77.10%
Weekly	7	4.20%	81.30%
Daily	31	18.70%	100.00%
Total	166	100.00%	100.00%

95% Conf Limits

1	33.40%	48.90%
2	14.10%	26.80%
3	7.50%	18.00%
4	6.10%	15.90%
5	11.50%	23.40%

95% Conf Limits

1	41.60%	57.30%
2	11.50%	23.40%
3	6.60%	16.60%
4	1.70%	8.50%
5	13.10%	25.40%

The table above shows that at the 0.05 level of significance, the distributions are similar except for the category of those who never use the service and those who use the service weekly (see the 95% confidence limits). This is depicted graphically below.

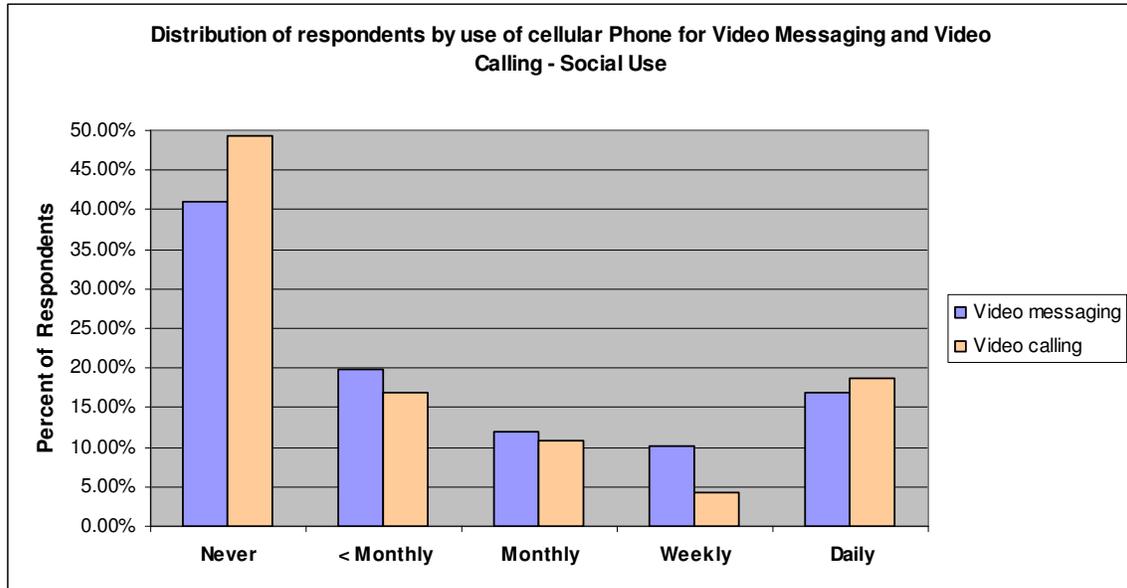


Figure 5.27: Distribution of respondents by use cellular phone for video messaging and video calling for social purposes

Note: There is no apparent association with income level.

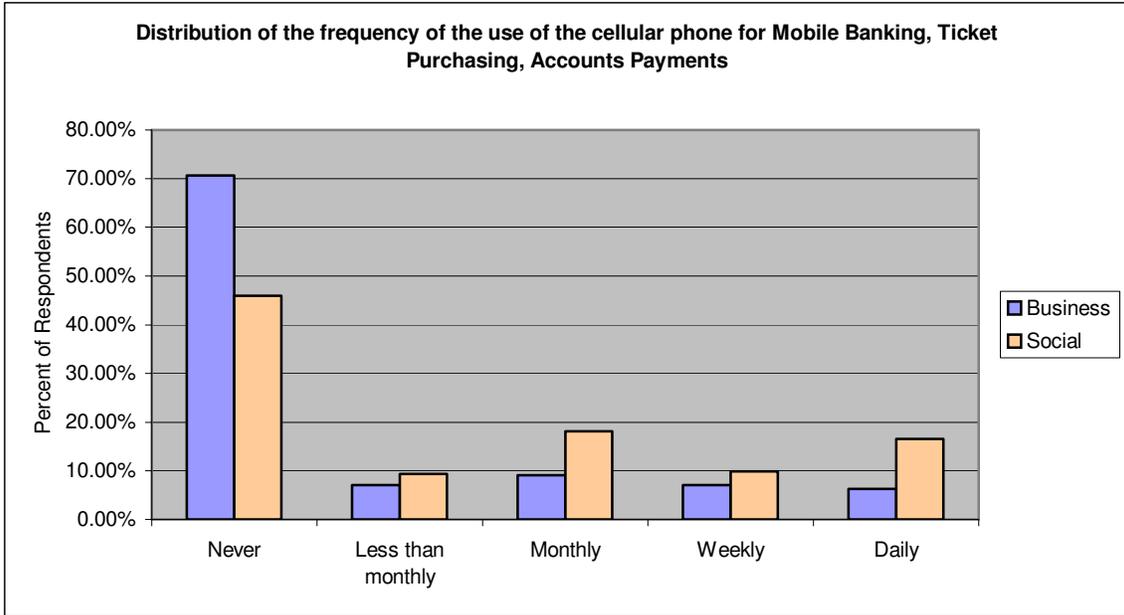


Figure 5.28: Distribution of the frequency of the use of the cellular phone for mobile banking, ticket purchasing and accounts payments

Note: There is no apparent association with income level.

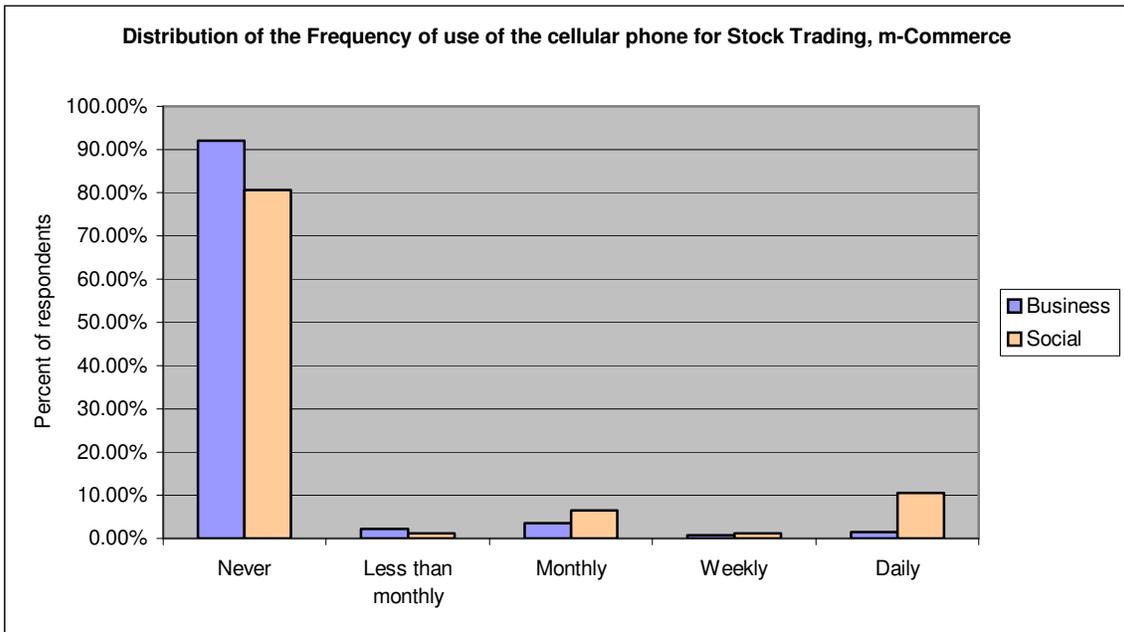


Figure 5.29: Distribution of the frequency of use of the cellular phone for stock trading and m-Commerce

The graph above shows that most of the respondents do not use the cellular phone for stock trading and m-commerce; however the service is used more for social purposes than for business purposes.

There is no association between those using the service for business purposes and level of income.

Table 5.12: Chi-squared of association phone use and m-commerce

Chi-squared	df	Probability
26.7035	16	0.0449

The table above shows that there is association (p-value = 0.05 or at the 0.05 level of significance) between frequency of use of the cellular phone for stock trading and m-commerce and level of income. This is depicted graphically below.

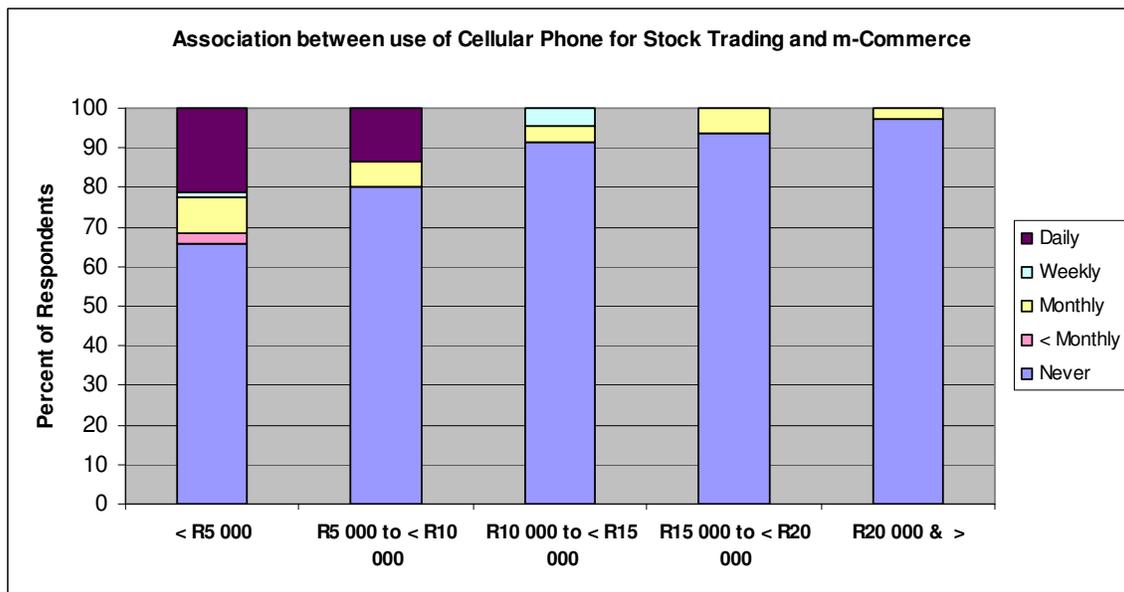


Figure 5.30: Association between the use of cellular phone for stock trading and m-commerce

The graph above shows that the use of the cellular phone for stock trading and m-commerce tends to decrease with an increase in level of income.

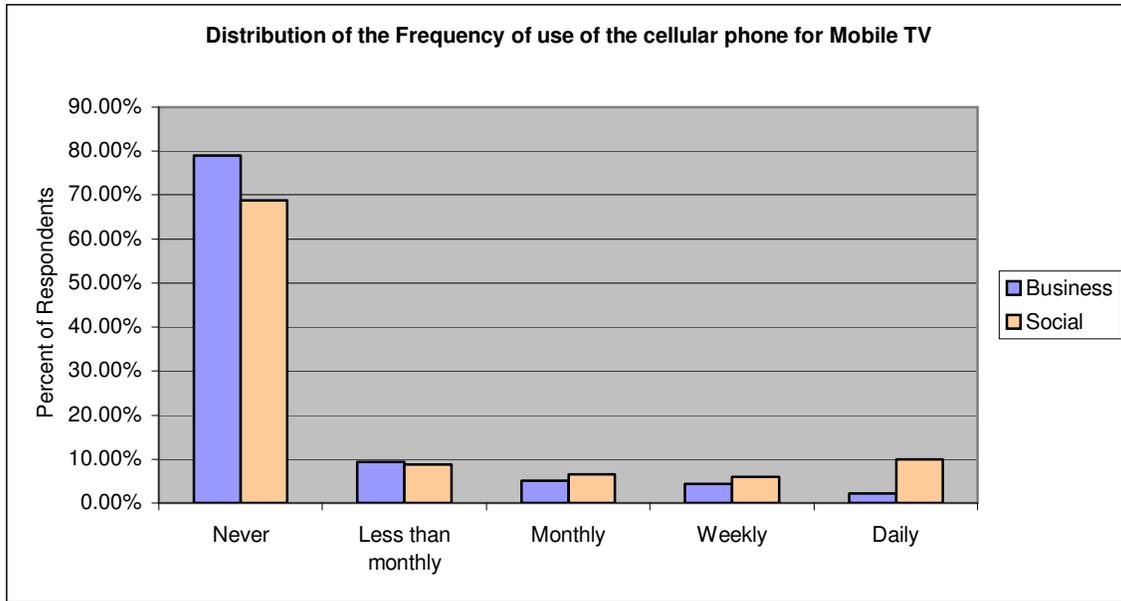


Figure 5.31: Distribution of the frequency of use of the cellular phone for mobile TV

The graph above shows that most of the respondents have never used the cellular phone to watch mobile TV. This might be because this is a new service and most people do not have the right cellular phones (DVBH compatible phones) because they are not readily available. Those who have used the service used it more for social purposes than for business purposes on a daily basis.

Table 5.13: Chi-squared of association mobile TV and income

Chi-squared	df	Probability
27.1332	16	0.04

There is association (at the 0.05 level of significance) between the use of the cellular phone for mobile TV and level of income (p-value = 0.04). This is depicted graphically below.

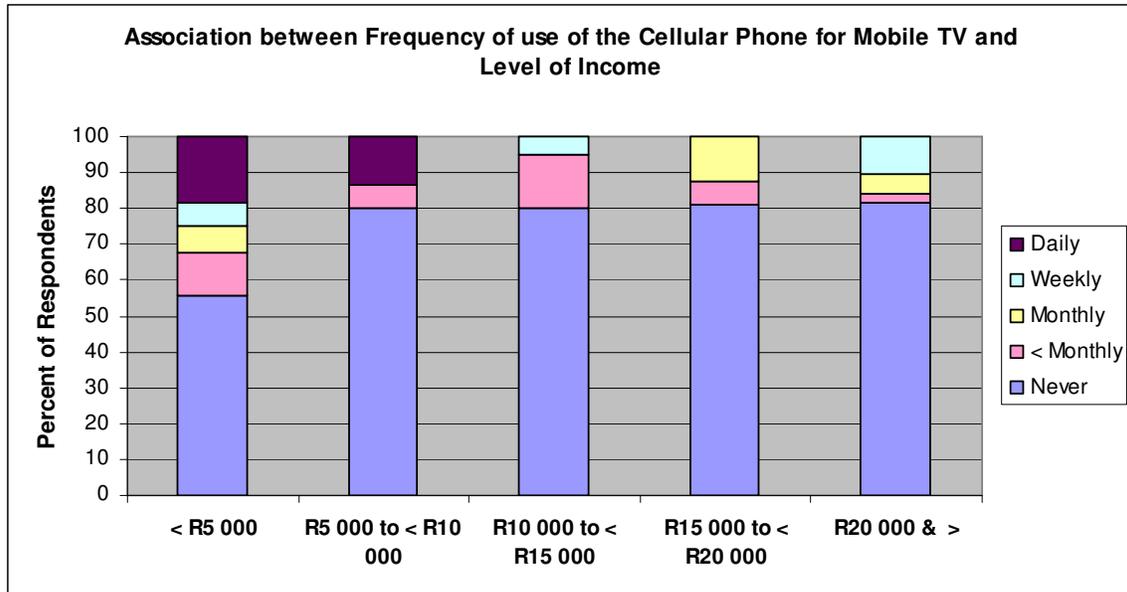


Figure 5.32: Distribution of the frequency of use of the cellular phone for mobile TV and level of income

The graph above shows that the daily use of the cellular phone for mobile TV decreases with an increase in level of income. Moreover, the majority of those who use the service earn less than R5 000 per month.

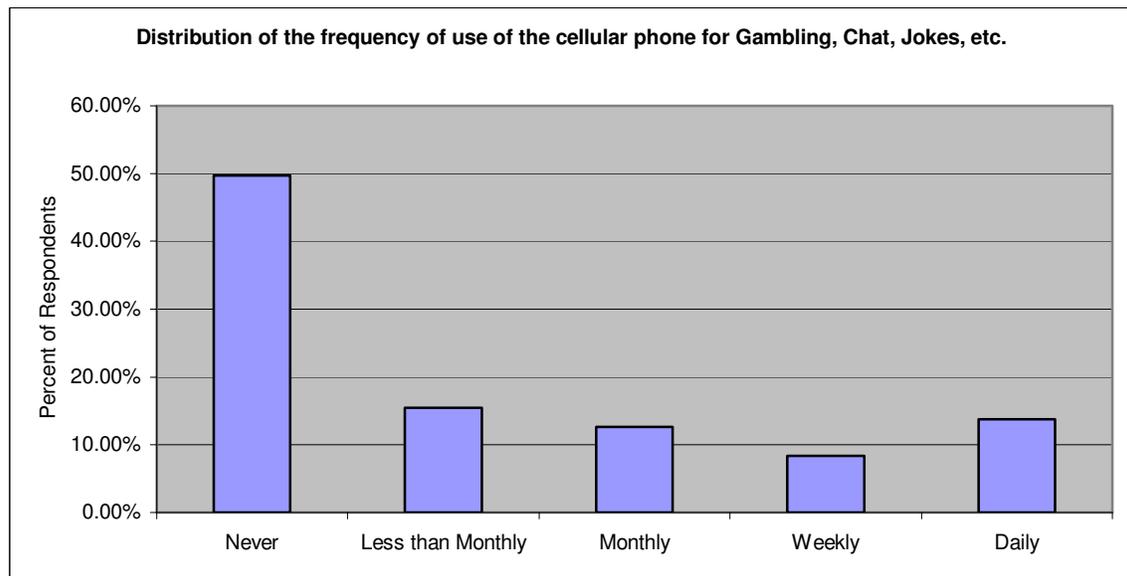


Figure 5.33: Distribution of the frequency of use of the cellular phone for Gambling, Chat rooms, Jokes, etc.

Table 5.14: Chi-squared of association phone use and m-commerce

Chi-squared	df	Probability
11.1452	4	0.025

The table above shows that there is association (p-value = 0.025) between frequency of use of the cellular phone for gambling, chat, jokes, etc. and occupation. This distribution is depicted pictorially below:

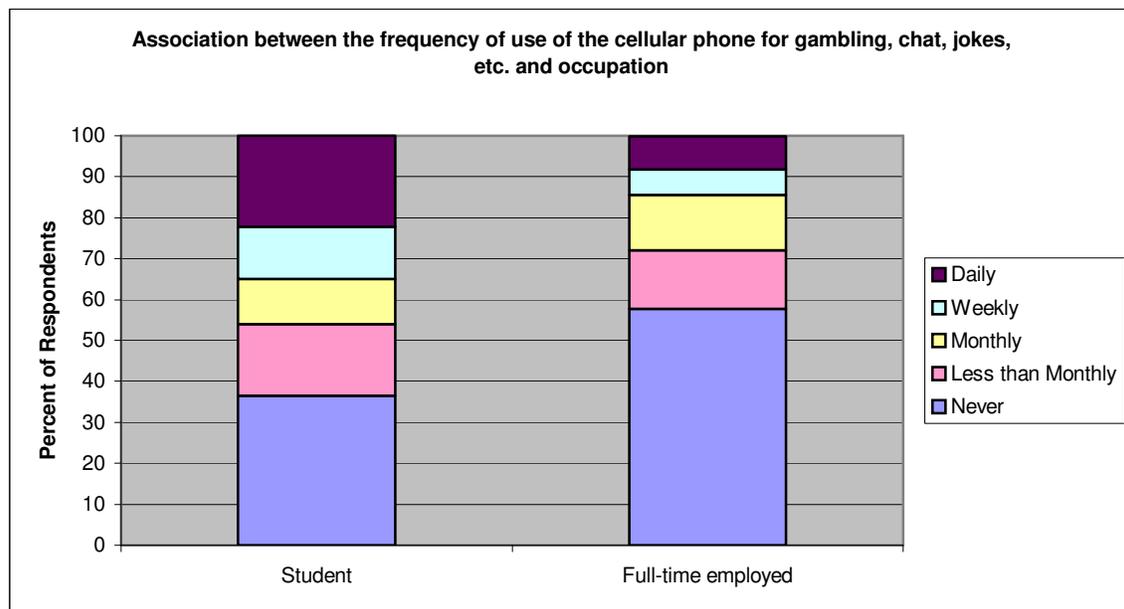


Figure 5.34: Association between the frequency of use of the cellular phone for gambling, chat rooms, jokes, etc. and occupation

The graph above shows that the service is used more by students (those earning less than R5 000 per month) than by the full-time employed (those earning R5 000 and more).

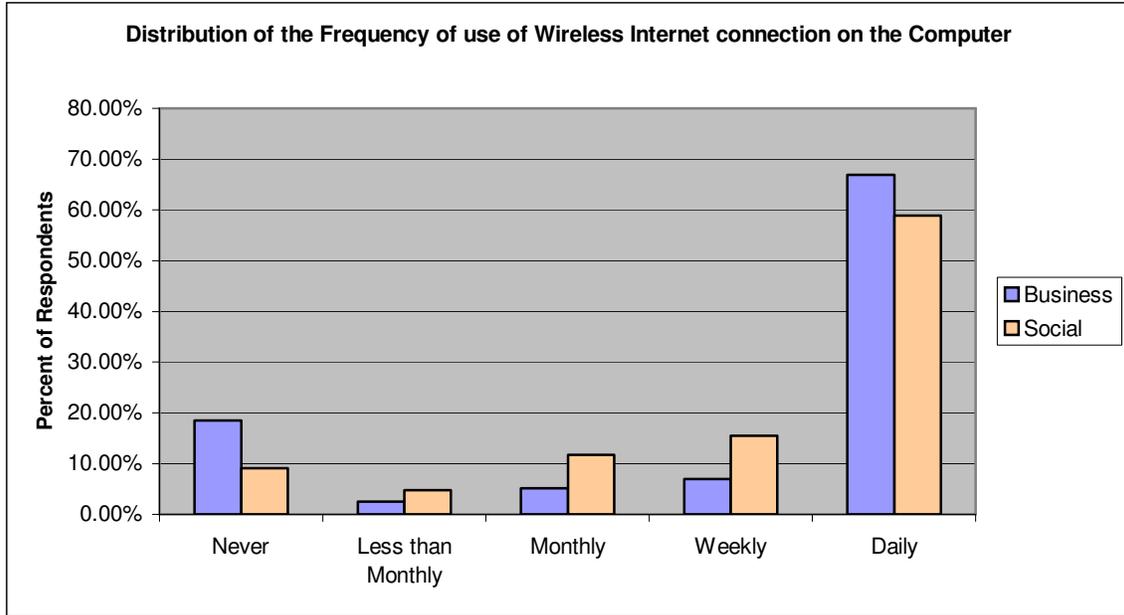


Figure 5.35: Distribution of the frequency of use of wireless Internet connection on the computer (laptop)

The graph above shows that a lot of respondents use wireless Internet connection, i.e. mobile data cards on their computers (laptops), to connect to the Internet on a daily basis, for business rather than for social purposes.

Table 5.15: Chi-squared of association Internet use and income

Chi-squared	df	Probability
58.0616	16	0.0000

The table above shows that there is high association between the use of wireless Internet on computer and level of income (p-value = 0.0000). This is depicted graphically below:

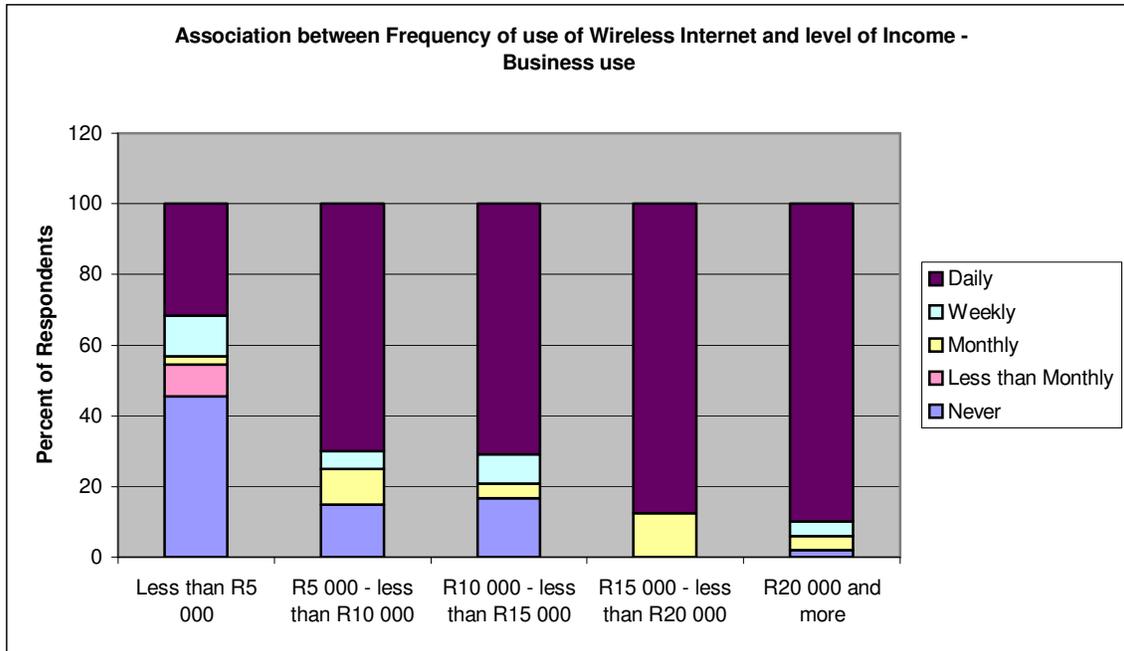


Figure 5.36: Association between frequency of use of wireless Internet and level of income

The graph above shows that the use of mobile wireless Internet increases with an increase in level of income. This could be because there are a lot of respondents who earn above R20 000 and the likelihood is that they are senior at their work and therefore probably have laptops and data cards which they use to access the Internet.

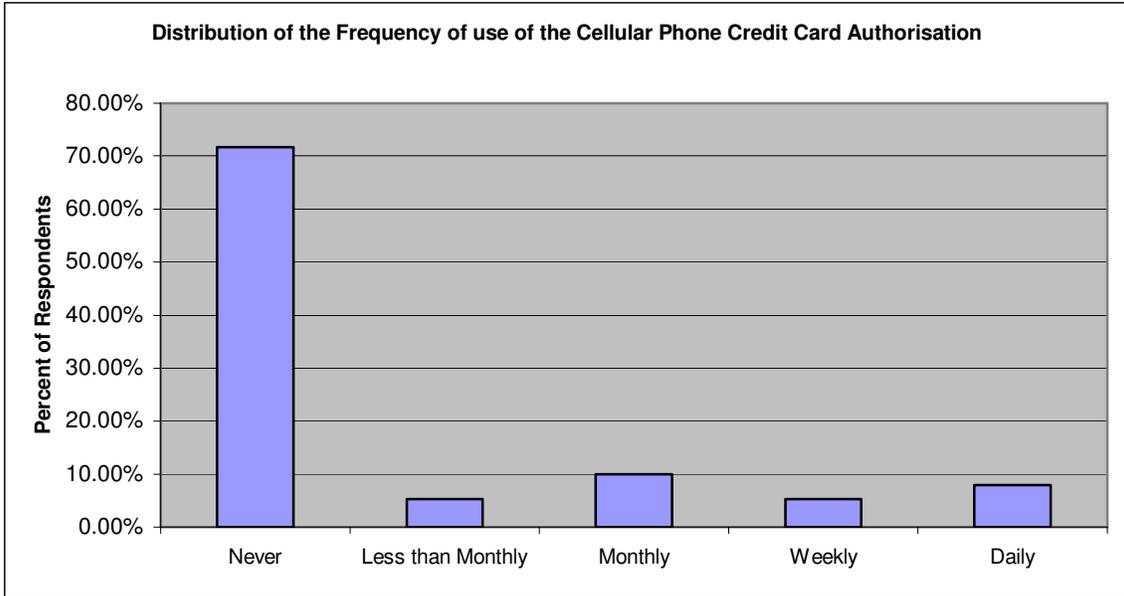


Figure 5.37: Distribution of the frequency of use of the cellular phone credit card authorisation

Seventy-two percent of the respondents have never used the cellular phone for credit card authorisation. Most of the respondents were also not aware of the service.

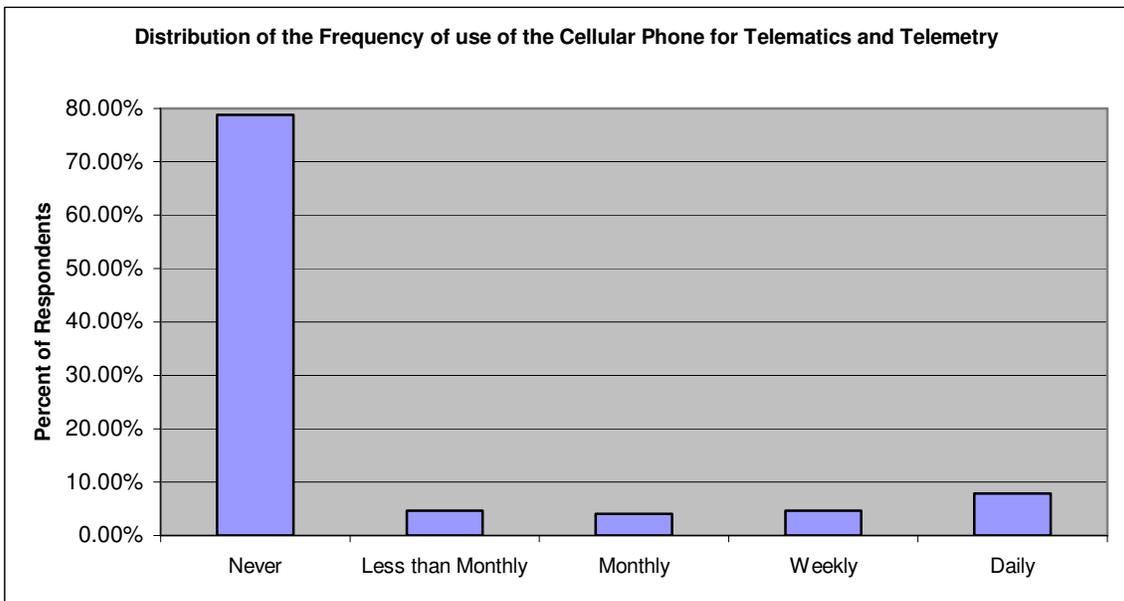


Figure 5.38: Distribution of the frequency of use of the cellular phone for telematics and telemetry

Seventy nine percent of the respondents have never used the cellular phone for telematics or telemetry services. Most of the respondents were also not aware of these services.

The graph below gives the distribution of expression by respondents on where and how they would spend extra money on broadband services.

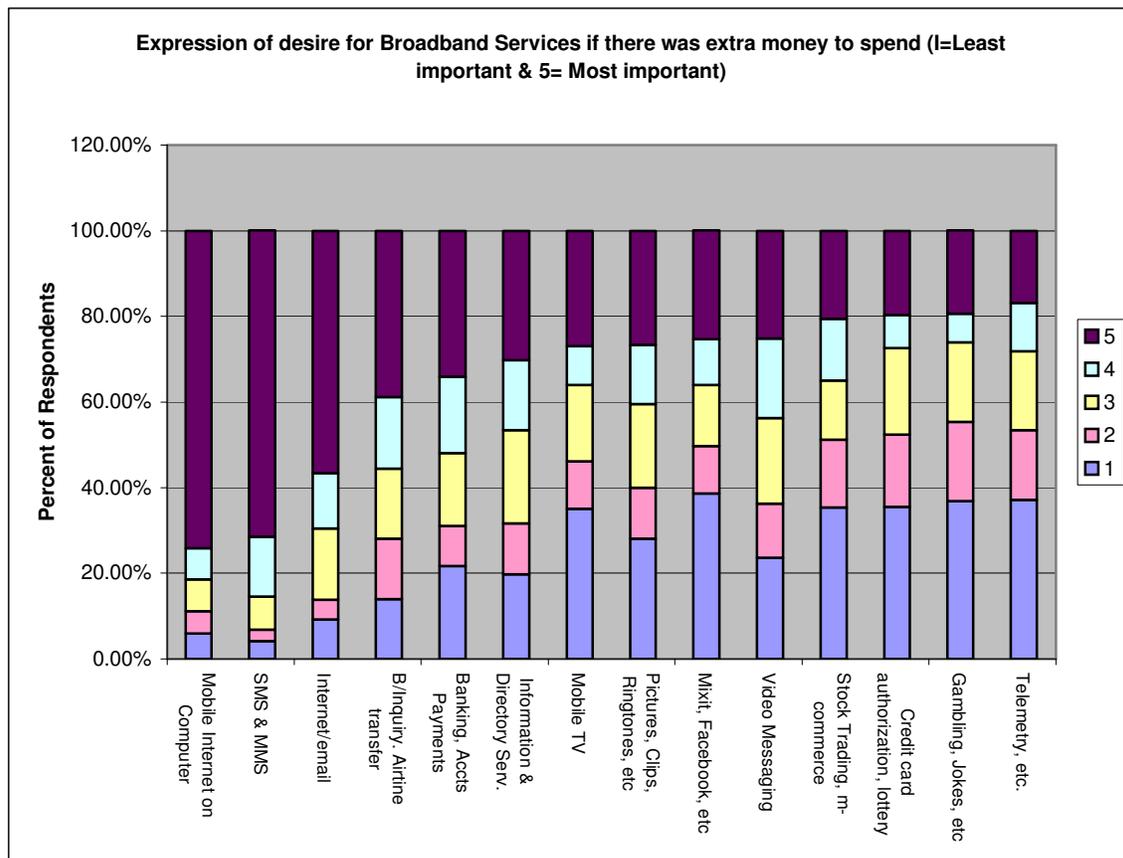


Figure 5.39: Expression of desire for broadband services if one had extra money to spend

Most of the respondents mentioned that if they had extra money to spend on broadband services, they would spend it on mobile Internet on computer, SMS and MMS, and Internet and/or email on the cellular phone. These were followed by those who said that they would spend the money on airtime transfer, banking services, information and directory services, downloads, video messaging, etc.

Not many people were forthcoming with suggestions of mobile data services not currently available that they would like to see. The following are the suggestions that were made:

Table 5.16: Services not currently available that respondents would like

Business Services	Entertainment Services	Social Service
Incoming Call ID with location info	Sports live	Notification of all social events
Mobile e-mail notification	Gig guide for parties	Order alcoholic beverages
Paying traffic fines	Movie updates	Play the lotto
Paying TV licences		Movie guide
Notification of commodities market prices (vegetables, meat, etc)		Requesting prostitutes for sexual pleasure

5.1.3 The Reliability, Affordability and Ease of Use of Services

The graph below shows the distribution of respondents according to what they think about the reliability of mobile data services (where, Rating 1 = works very poorly and 5 = works all the time).

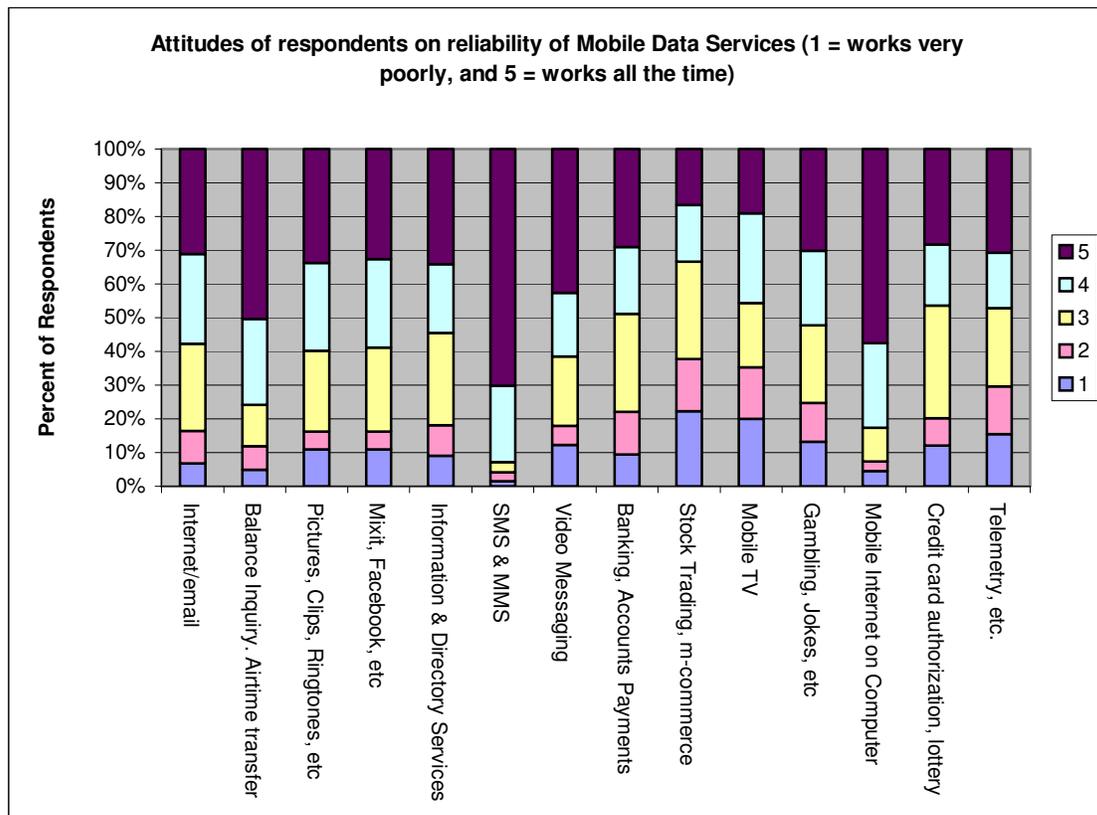


Figure 5.40: Perception of respondents on reliability of mobile data services

The results show that most of the respondents think that SMS & MMS are highly reliable, followed (in descending order) by mobile Internet on computer (laptop); balance inquiry and airtime transfer services; Internet and e-mail; downloading pictures, video clips, ringtones, etc.; interactive chat rooms such as Mxit, Facebook, etc.; and then information and directory services, video messaging, and jokes, chats, and similar.

There are, however, other factors influencing these results. These factors are the reliability and suitability of the equipment used, user-friendliness of the service, and network availability. For instance, the following results give the distribution of respondents according to their attitudes on how easy it is to access mobile data services on the cellular phone (Rating 1 = not easy to use and rating 5 = very easy to use).

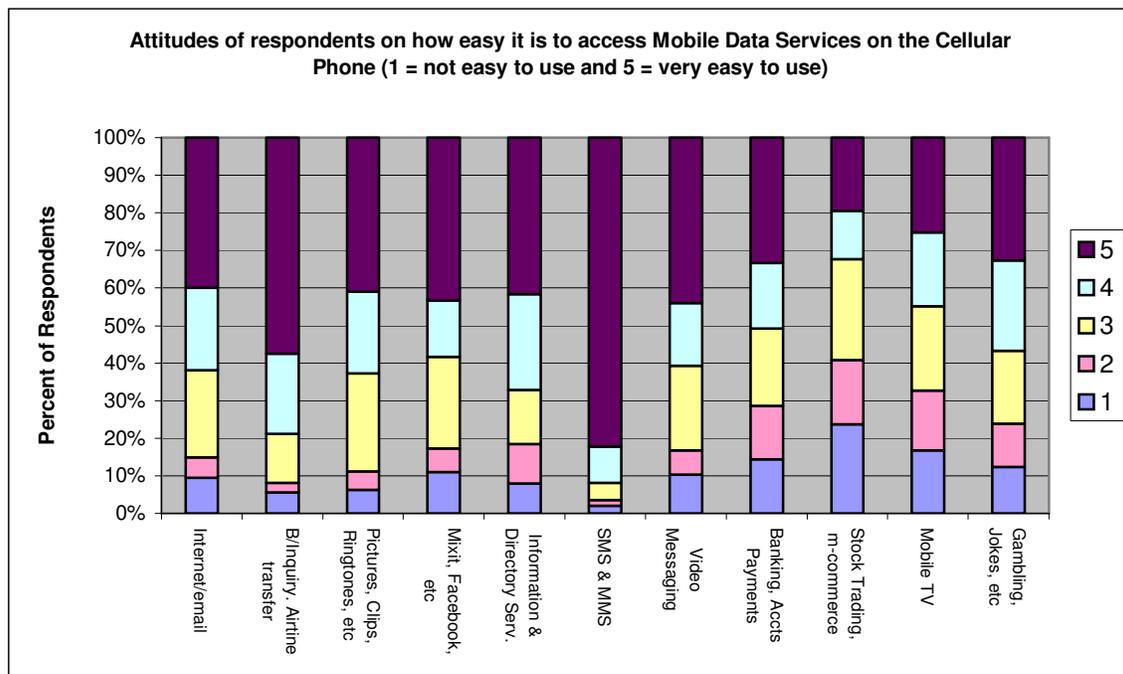


Figure 5.41: Perception of respondents on how easy it is to access mobile data services

The graph above shows that most of the respondents think that SMS & MMS are very easy to use, followed by balance inquiry and airtime transfer services; then video messaging; Internet and email; downloading pictures, video clips, ringtones, etc.; interactive chat rooms such as Mxit, Facebook, etc.; information and directory services; and then video messaging. These results are similar to those for reliability rating.

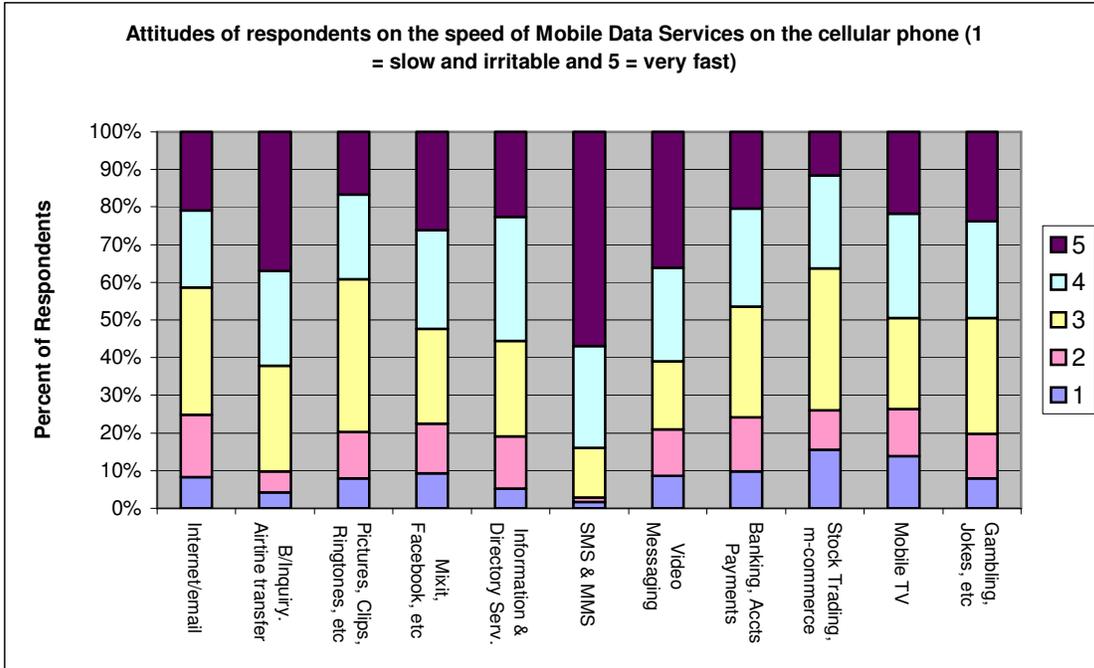


Figure 5.42: Perception of respondents on the speed of mobile data services

The graph above shows that most of the respondents think that SMS & MMS are very fast; followed by balance inquiry and airtime transfer services, etc. These results are similar to the ones for reliability and user friendliness.

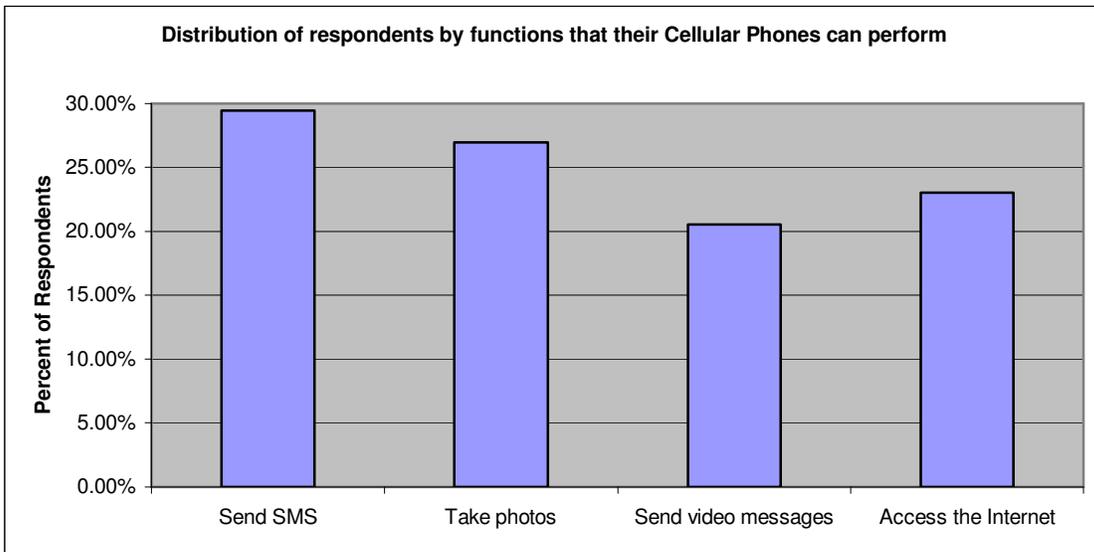


Figure 5.43: Distribution of respondents by functions that their cellular phones can perform

Thirty percent of the respondents indicated that their cellular phones could send and receive SMS and MMS, while only twenty-three percent indicated that they could access the Internet via the cellular phones, and twenty-one percent indicated that they could send video messages.

Overall, these results indicate that there is still potential for growth for mobile data services.

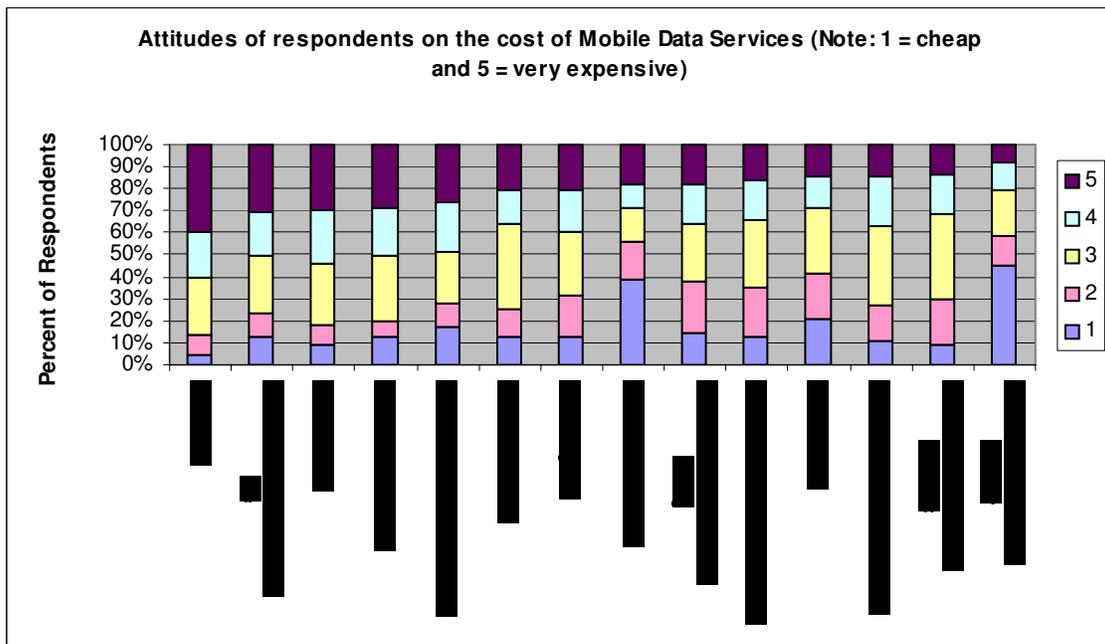


Figure 5.44: Perception of respondents on the cost of mobile data services

The graph above shows that respondents thought mobile TV was the most expensive service; followed by downloading of pictures, video clips, ringtones; then by accessing the Internet or sending or receiving e-mail etc. Balance inquiry and airtime transfer were the cheapest, followed by information and directory services, chat rooms, SMS, etc.

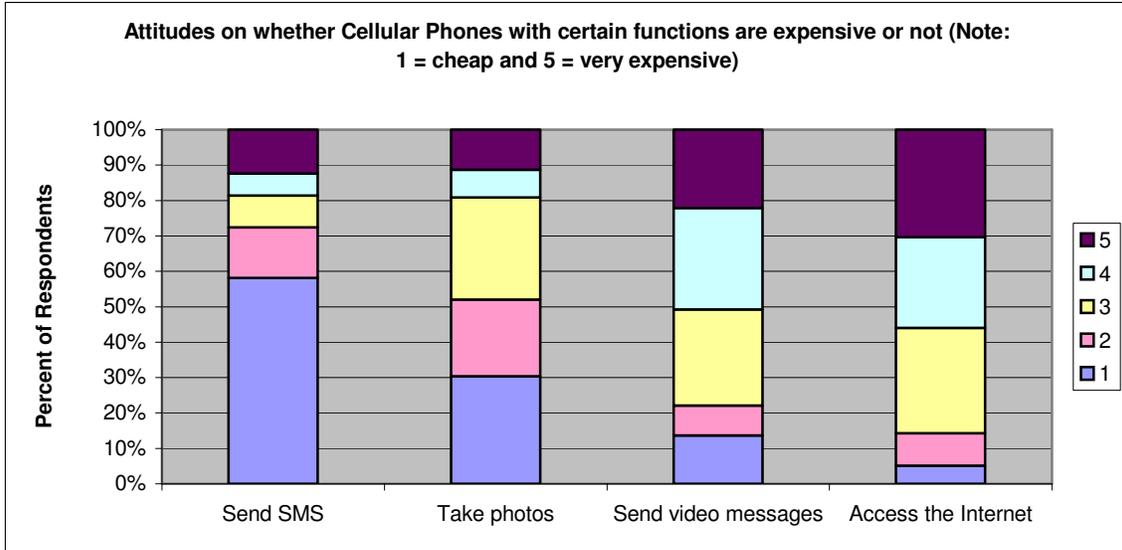


Figure 5.45: Perception on whether Cellular Phones with certain functions are expensive or not

The graph above shows that most of the respondents thought that cellular phones which have the ability to send and receive e-mail and access the Internet are expensive, as opposed to the phones that can just send and receive SMS.

This, therefore, shows that with the right marketing strategies and pricing there is potential for growth for broadband services uptake.

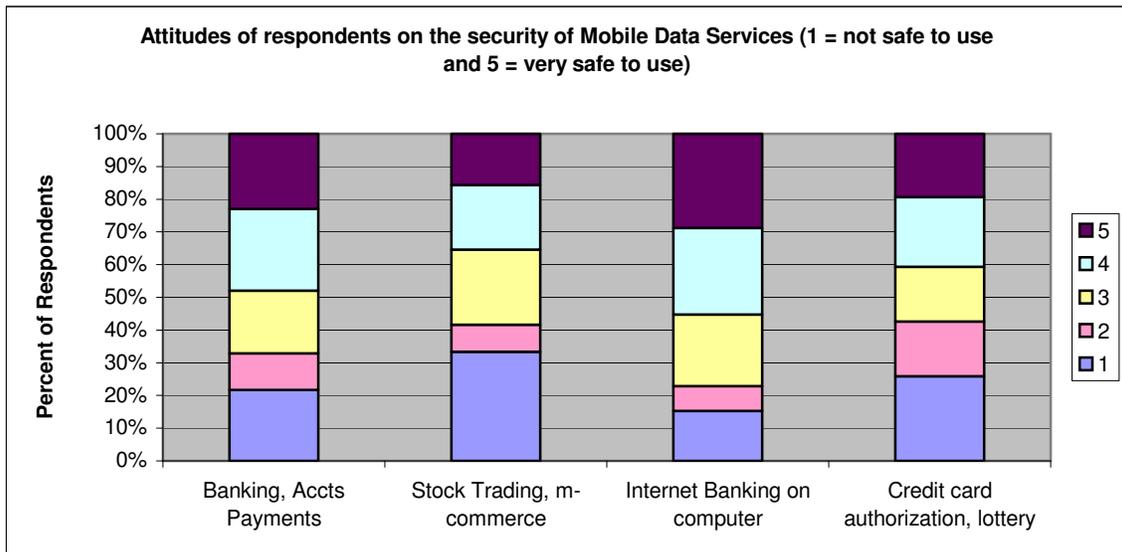


Figure 5.46: Perception of respondents on the security of mobile data services

The graph above shows that most respondents thought that stock trading, m-commerce, credit authorisation, mobile banking and accounts payment using the cellular phone were not secure, whereas they considered mobile Internet banking to be safe.

Again this shows that, with the right marketing and communications strategies, there is potential for growth in broadband services uptake.

5.1.4 The Partnership between Network Operators and WASPs

5.1.4.1 Sample Description of Service Providers

Only six service providers and the three mobile network operators responded. These companies provide the following services targeted at the low, medium, and high income markets:

Table 5.16: Services offered and the target market they are intended for

Service	Target market		
	Low income	Middle income	High income
Ringtones		2	
News and Weather	1	1	
Music		2	
Mobile TV	1	1	
Mobile games		2	
Wallpapers		2	
Adult content	1	1	1
Soccer alerts		1	1
Sport	1	1	1
Dating service		2	
Welcome tones		2	
Backgrounds		2	
Business products			1
Field force products		1	
MMS	1	1	1
SMS	1	1	1
Data contracts		1	1
Prepaid data bundles	1	1	
Mobile portal	1	1	1

Service	Target market		
	Low income	Middle income	High income
Loading (Content Club)	1	1	1

The spectrum of services in the sample is a good representation of services in the industry, and also covers the different income markets well. The small number of respondents is not a problem since it does not introduce bias into the results; it is mostly the business environment (industry) that we are interested in, and not the individual opinions.

5.1. 4.2 Services and Target Market

All the companies that responded to the survey indicated that some of the services they provided are not originally from South Africa, i.e. that they were copied from elsewhere (abroad) and adopted for the South African market.

Most of the companies target the middle income bracket, with less emphasis on the low income market. Very few of their services are targeted exclusively at the high income market.

Two network operators indicated that they do not know the content consumption patterns in the low income market, and that group surveys conducted show that their content is too expensive. Generally the cost to access, i.e. purchasing the right equipment (cellular phone or data card and laptop) services, is seen as a limitation to both the low and middle income bracket groups; hence, they do not specifically target this market. However, these operators conceded that once the necessary equipment has been purchased the cost of utilising the service is not considered as a limiting factor.

Four out of the nine companies thought that their services were suited for the low and middle income bracket groups, whilst three thought that their services were suited for all the three markets i.e. low, middle and high income bracket groups.

Five companies stated that they involved or sought input from the subscribers and or potential subscribers when planning, developing, or introducing new services. They involved subscribers and or potential subscribers through focus groups, concept testing, blind discussion groups, telephone interviews, usability groups and market research; whereas one network operator indicated that they carried out market research only for services that require significant capital investment. Otherwise, they made predictions based on their knowledge of the consumer segments and matched these to global trends or assumed behaviour.

Some service providers indicated that they shared market information with network operators and other WASPs, whilst others stated that they did not. Some also indicated that they collaborated with other WASPs on market research, whilst they do not collaborate with network operators on market research.

Seven companies believed that the cost of services is expensive and five believed that this was a barrier for exploiting opportunities in the lower and medium income bracket groups. However, they felt that with time the cost would come down sufficiently for them to exploit the huge opportunities in these markets. However, seven thought that it was the price of the appropriate equipment cellular phones, data cards and laptops that was a barrier to exploiting the huge opportunities in these markets.

Seven companies believed that the speed of accessing services was slow, whereas eight believed that network performance and coverage was a barrier in exploiting business opportunities brought about by the mobile broadband technology.

In general, most companies felt that the relationship between network operators and WASPs is good, even though at times it can be strained due to the increased competition between them. Others also indicated that the competition forces them not to liaise on a lot of issues for fear of compromising their competitive advantage.

Some service providers indicated that they specialise in content creation and service development and how best to market it; therefore network operators should focus on selling airtime and be open to ideas that will increase ARPU and hence revenue, and stop acting like gatekeepers by dictating to the market what should or should not be launched. They felt that the network operators should do away with the content aggregator model as well as the WASP model.

Seven out of the nine companies felt that the strategic partnership between network operators and WASPs could work to their benefit and stimulate the usage of mobile data services in the low and medium income bracket if:

- There was a focussed effort to ensure that network performance is improved and coverage increased;
- The cost of the necessary equipment (cellular phones, data cards and laptops) is reduced;
- The networks operators reduced the charges on online billing systems and introduced incentives that would allow the WASPs to offer price competitive services targeted for these markets;
- The relevant content and services focused for these markets were developed and launched at the right price;
- These segments were encouraged and assisted to develop their own relevant content and services;
- The right marketing and communications strategies focused for these markets were devised and implemented;
- The service providers could stretch the boundaries and be more creative when developing services, go beyond pure SMS and ringtones, and stop being too reliant on network operators;
- The networks could stop channelling subscribers to pre-defined portals such as “Vodafone live” and could grant them access to the whole world wide web; and
- If more distribution channels targeting the low and middle income segments were introduced.

5.1.4.3 Revenue and Risk Sharing

In general, most companies felt that the bulk of the money should go to whoever takes the most risk. The difference emerged in agreeing on whether it is the network operators, the content providers or the WASPs that carry the most risk.

Eight companies indicated that the content provider should get at least fifty to sixty percent of the revenue, whilst the other forty to fifty percent should be shared between WASP and the Network operator or, in short, be shared by the rest of the distribution value chain. The reasoning expressed was that the content provider is the owner of the product and without the product there is no business.

One network operator felt that the revenue model is fine as it is. Since they own the customers, the network, the distribution network, the billing systems and the support infrastructure, they must get the bulk of the revenue.

Three models of sharing the revenue were suggested:

- The network operator takes fifty percent and the content provider and/or WASP take the other fifty percent;
- The content provider takes sixty percent, the network operator takes thirty percent and the WASP takes ten percent, where they act only as facilitators; and
- Where there is no risk shared, a fixed fee is more appropriate e.g. R1.50 per ringtone and not fifty percent of the amount charged, say R10.00.

Currently, the model which is generally used for revenue is that the service providers gets about twenty-five percent of the revenue, the network operator gets fifty cents on every service received via SMS and twenty cents for a service involving an unstructured supplementary services data (USSD) transaction, and the rest of the money goes to the WASP.

6 Chapter 6: Discussion, Conclusions and Recommendations

6.1 The Profile of Respondents

In general, the sample constituted mainly students and fulltime employed young black males between the age group sixteen and forty five years, who are reasonably educated people and earn below R10 000 per month.

As indicated by Spero & Stone (2004) students and/or teenagers are a very discerning and highly cynical audience; hence, companies have to combine the best creative ideas and strategies with a transformed approach to marketing sales and service, embodying the best of information and communications technology, reliably and securely implemented.

Spero & Stone further affirm that patterns of adaptation mushroom and then wither away quickly, at a pace which is hard to understand, while new technologies are picked up quickly, provided that they observe the basic rules of economy (not too expensive), adaptability (quick, easy and cheap to adapt to user needs), technical pervasiveness (you can use them anywhere) and market pervasiveness (lots of people use them and therefore it is easy to establish one's own network of connection).

Network operators and content providers, therefore, need to realise that new technologies and services can be picked up quickly, as long as they are not expensive, and are adaptable, technically pervasive, and market pervasive. Lastly, they need to realise that most teenagers will not buy any product that does not fit into or enhance their lifestyle.

6.2 The Demand and Awareness of Mobile Data Services

In general, most of the respondents were aware of many of the mobile data services offered by the mobile network operators. Between ninety and ninety-six percent of the respondents were aware that one could do a balance inquiry and airtime transfer; send/receive and download pictures, clips, ringtones, etc; access the Internet and download information from the Internet; send and receive e-mail; and send and receive SMS and MMS with a cellular phone.

Between eighty and eighty-four percent of the respondents were aware of the availability of services such as video messaging; video calling; mobile television; mobile gambling; downloading of jokes; mobile banking; accounts payments and directory services on a cellular phone.

Seventy-nine percent of the respondents were aware of chat services, including Mxit and Facebook. These services are used more extensively by students who earn less than R5 000 per month than by the full-time employed, who earn R5 000 and more.

On the other hand, only between fifty and sixty percent of the respondents were aware of telemetry and that one can use a cellular phone for stock trading and credit card authorisation i.e. mobile commerce.

These findings are in line with a survey conducted by in 2006 Hamilton *et al.* of the BMI-T group which showed that South Africa is already edging into the early majority phase of emerging digital media adoption – at least for those citizens who have access to PCs and the Internet. Storing and sharing digital content has become a national pastime as nearly everyone is comfortable with electronic messaging, digital pictures and music. South Africans of all ages, but particularly the younger generation, love their PC and cellular devices, not only for work purposes but for all types of entertainment.

Since seventy-five percent of the respondents were blacks, these findings further confirm the findings of a survey by Hamilton *et al.* that black South Africans are rapidly closing the technology adoption rates between them and whites, Indians and coloureds in respect of access to services.

Most respondents would actually prefer to receive information about these services through their service providers, as opposed to the current method of receiving information via the television. Their order of preference for this follows the pattern: service provider, television, print media, radio and friends.

The reason that most respondents prefer to receive information about mobile data services through service providers could be that the service provider is likely to explain and provide more information about the service than other media. Where applicable, the service provider could even help load the service and/or ensure that it does indeed work as it is supposed to.

As Sharma & Mehrotta (2006) stated, customers seek specific channels, as each channel has unique offerings that fulfil their particular needs. Also, each channel attracts a specific type of customer, and so some customers may not approach the firm if that type of channel is not available.

Sharma & Mehrotta further indicated that extensive multichannel strategies increase coverage and allow firms to reach a higher proportion of customers by matching the needs of the customers. Some distribution channels are better at reaching certain types of customers, and multichannel strategies enable a firm to reach each type of customer. In addition, multichannel strategies allow customers to interact through the channel of their choice.

Amongst the respondents who were aware of the Internet and e-mail service, the number of those who had never used the service for business purposes was greater than the number who reported using it for social purposes alone. This could be because there are a lot of respondents who earn above R20 000 and

the likelihood is that they are senior at their work and therefore probably have laptops or desktops which they use to access the Internet or to send and receive e-mails. The other reason could be because a lot of respondents are students. Since they do not work, they would not use the Internet and/or e-mail for business purposes.

For income levels less than R20 000, the overall use and in particular the daily use of the cellular phone to access the Internet and/or e-mail tends to increase with an increase in the level of income. On the other hand, the proportion of those who never use the cellular phone to access the Internet and/or e-mail tends to decrease with an increase in the level of income. However, this trend does not continue for income levels above R20 000.

As stated above, this could be because those who receive high incomes tend to be senior in their organisations and would most likely have access to other means of accessing the Internet and or e-mail e.g. by using laptops and data cards.

The results also show that the daily usage of a cellular phone to access the Internet and/or e-mail for social purposes tends to decrease with level of income.

Again, this could be because those that get high incomes tend to be senior in their organisations and would most likely have access to other means of accessing the Internet and or e-mail e.g. by using laptops and data cards or desktops.

The other reason could be because the majority of the respondents are students and hence for them the easiest way of accessing the Internet is through their cellular phones, as opposed to people at work who have the option of using their laptops or desktops.

Most of the respondents indicated that if they had extra money to spend on mobile broadband services they would spend it on the following, in order of

priority: mobile Internet and or e-mail using a laptop, SMS and MMS, and mobile Internet and/or email using a cellular phone. These were followed by those who said that they would spend the money on airtime transfer, banking services, information and directory services, downloads, video messaging, etc.

The findings here are in line with the studies conducted by Lu *et al.* (2003) and Chen *et al.* (2006), who showed that perceived usefulness – which is defined in terms of a belief about how the technology would enhance job or work performance – is always a determinant of technology, product or service adoption.

These findings are also in line with a study designed by the Consultative Group to Assist the Poor (CGAP), produced through a partnership between CGAP, the United Nations Foundation and the Vodafone Group Foundation, with important contributions from South Africa's FinMark Trust, which showed that poor people in South Africa are using mobile banking services and value them highly. The study also identified the challenges of bringing mobile banking to more poor consumers, including the need to develop a better understanding of poor people's perceptions of banking, technology and mobile-banking.

The GCAP study concluded that, in order to be successful, mobile operators must listen to their customers and adapt their services to suit their customers' needs. Those that were previously silent and ignored can now be heard, and the industry must take account of this. This means challenging traditions and adapting existing business models in order to provide real, relevant benefits to people.

The research by Weiser's (2007) on trailblazing companies also showed that there are five key strategies for achieving success in these markets. These include mining and translating local market information; adapting the business model to community realities; changing internal incentives and challenging cultural assumptions; creating partnerships and strategic alliances; and improving the enabling environment.

Mobile operators have started doing some of these things, for example in the buying of strategic Internet service providers (ISP's) and the formation of strategic alliances with big brands such as Multichoice, First National Bank, Vodafone, Standard Bank, ABSA, Omnifone etc.

The GCAP study further showed that banking through mobile phones has been common in developed countries for years. But the real potential of mobile banking may be to help give millions of poor people access to financial services for the first time. As mobile phone usage expands, so may opportunities to bank the un-banked.

The study also suggests that mobile banking providers may discover better results in branding their service as a safer, more convenient payment mechanism rather than marketing it as a better bank account. This is a factor which is also acknowledged by respondents in these findings.

The findings are also in line with the results of a study conducted by Goodman & Walia (2006), which pointed out that low-income customers often have sporadic cash flow and are usually on daily or weekly wages. The ability to top-up airtime in small increments enables them to manage their airtime consumption in line with their restricted and unpredictable cash flow. Many users purchase airtime using balance transfer from resellers and dealers, although some users will purchase airtime from friends and family in exchange for cash.

The fact that respondents made suggestions about services that are not offered presently but which they would like to see being offered in the future, and that they indicated they would use the mobile data services if certain needs were met and if they had extra money, indicates that there is an unmet demand for mobile data services.

Most of the respondents have never used the cellular phone to watch mobile television. This could be because this is a new service and most people do not

have the right cellular phones (DVBH compatible phones) because they are not readily available. Those who have used the service used it more frequently for social purposes than for business purposes, on a daily basis.

6.3 The Reliability, Affordability and Ease of Use of Services

The major reasons for which respondents signed up for mobile broadband Internet services were that they wanted an always-on connection anytime, anywhere. They also desired faster speed when accessing e-mail and other services, and when downloading data from the Internet. Lastly, they wanted the advantage of mobility.

Most of the respondents said they would use mobile broadband Internet service if:

- It cost less to use;
- The speed was faster;
- The service was easy to use, as on the PC or a laptop;
- The cellular phone had a larger screen;
- The cellular phone used less battery power; and
- The keyboard was larger.

In general, aesthetics and battery power are not important to most respondents; most respondents are more concerned about cost, speed and ease of use.

Most respondents thought that the price of mobile broadband services was too high. Some were concerned about the security of the connection when using some of the services and those that have never used these services thought it would be difficult and complex to set up a cellular phone to access the services.

Again here price comes out as a major concern, showing the need for educational campaigns about mobile data services and their benefits. There is also clearly a need to address concerns about security and the complexities of setting up cellular phones for these services (ease of use).

The results show the existence of a sizable percentage of potential users who could use these services if their concerns were addressed. This is accordance with the classic Rogers model, which defines five adopter groups including innovators, early adopters, early majority, late majority, and laggards, as shown in figure 3.2, where the laggards are always late in adopting any new technology.

Similarly, the study by Hsu *et al.* (2006) showed that visibility considerations are important for the late majority group (laggards). These findings also indicate that this group needs information to evaluate before making a decision. When late adopters have the opportunity to observe the use of data services by others, they will have a higher tendency to use it. Other people's experiences can become the information for their evaluations of data service adoption. Therefore, managers should strive to encourage opinion leaders and users to influence potential adopters to use mobile data services.

The findings of this study also confirm the study conducted by Hsu *et al.* (2006) which generated insights into mobile operators concerning the fact that broadband data services may overtake SMS. However, users may be concerned about price issues before they decide to use them. According to Hsu *et al.* (2006), Wu and Wang (2005) also found that high cost has a negative influence on users' intention to use mobile commerce.

These findings also imply that:

- Appropriate marketing and communications strategies should be employed for specific adopters;
- It is important for managers to understand the threshold of spending that users can accept.

These findings are also in accordance with the technology acceptance model shown in figure 3.1, which assumes that beliefs about usefulness and ease of use are always the determinants of information technology adoption. The

implication here is that content providers should improve the ease of use and the user friendliness of their data services, in order to increase their acceptance. Ease of use has been found to have a significant effect on adoption intention.

The findings are also in line with another study conducted by Goodman and Walia (2006) in Egypt, who found that affordability is a major barrier to increasing the take up of mobile services in low-income markets, where the ability to pay is severely restricted beyond the top socio-economic tier of the population.

Lastly, as Anderson and Billou (2007) indicated, by leveraging availability, affordability, acceptability and awareness, companies can achieve growth and profit, which are both elusive goals in many developed markets.

Most respondents thought that SMS was the most reliable and easy to use service, followed by accessing Internet using a laptop and balance inquiry and airtime transfer.

6.4 The partnership between Network Operators and WASPs

Even though some respondents said they involved or got input from the subscribers and/or potential subscribers through focus groups, concept testing, blind discussion groups, telephone interviews, usability groups and market research when planning, developing, or introducing new services, it is clear from the findings that this is not always done. If it is done, it is not intensive, especially if services do not require significant capital investment. Generally, they make predictions about the market based on the knowledge of the consumer segments matched with global trends or assumed behaviour.

This was evident in the responses of most companies that some of the services they provided are not originally from South Africa, i.e. they were copied from overseas and adopted for the South African market. Others also indicated that they do not know the content consumption patterns in the low income market.

These findings are contrary to the studies by Matthing *et al.* (2004) who argued that one reason for the apparent mismatch between technology-based services and people's needs is that conventional market research techniques are not effective for such services, and that they only manage to skim the surface of user needs.

Matthing *et al.* also contend that the involvement of customers provides a deeper understanding of their needs, and increases the likelihood that the new service ideas will meet those needs. It also improves the effectiveness of new service development.

Matthing *et al.* further state that the challenge lies in the identification of innovative customers and effectively employing such customers to generate new product and service ideas in a technology-based service setting. Thus, a process for identifying these customers is critical for successful development of new technology-based services. Researchers have proposed that companies should direct their energies towards a small sample of innovative users. These lead users are "early birds" in discovering and acquiring new technology, as well as in responding to new products and services.

By observing the needs of these lead users and the solutions they have worked out, companies can foresee the services of tomorrow and adjust their own development work accordingly. Such lead users are skilled at predicting future conditions and also have strong needs for solving their present problems.

Bareham (2004), on the other hand, contends that large quantities of data can be collected about consumers from requests or purchases made via the Internet, e-mail, text messages, and mobile phones, and from checkout information. He stresses that data warehousing makes it possible to get a range of consumer data all in one place, including the tracking of customer purchases and behaviour over several years. On the other hand, data mining potentially makes it possible to predict future response to a promotion or a new product by analysis of past behaviour, and hence to create focused and tailored marketing activity. In

addition to conventional ways of segmenting customers in the marketplace, it also makes it possible to personalise a campaign for each person in the segment.

Again as shown by Bareham in his study, these companies can use relationship marketing which, rather than pushing the product or service at the consumer, attempts to create temptation, continuously reinvent the offering, and build a lasting and trusting relationship.

Learning more about the customer can ensure that the mobile network operators and WASPs do not dump first world services on customers who might have other priorities and interests. It ensure that they do not just modify these services to give them the local flavour by attaching their logos on them and then launching them, without having first researched whether indeed that is what the local consumers want or having ascertained whether they will generate any revenue out of them and hence increase the data ARPU.

The findings of the group surveys conducted show that content is too expensive and that the cost to access (i.e. purchasing the right equipment, cellular phone or data card and laptop) services is seen as a limitation to both the low and middle income bracket groups. This further confirms the earlier findings that the cost of cellular phones, data cards, laptops and mobile data services was high.

The issue of cost was also seen as a barrier for exploiting opportunities in the lower and medium income bracket groups, but most respondents thought that with time the cost would come down sufficiently for them to exploit the huge opportunities in these markets. Mobile network operators, WASPs and cellular phone manufacturers have recently started to address these issues, as witnessed by the huge discounts and specials that they have lately become common. Similar evidence of this appears in the recent reduction in the price of data bundles announced by the mobile network operators.

The findings that the speed of accessing services is slow, and that network performance and coverage was a barrier in exploiting business opportunities brought about by the mobile broadband technology, are also in line with studies conducted by Harker and van Akkeran, who identified that lack of speed is a barrier to adoption, as mobile data services are slow and hence insufficient. Network performance and coverage, lack of a standardised IT environment for developing mobile data applications, limited bandwidth, higher usage cost, increased latency, susceptibility to transmission noise and call dropouts are also cited as possible barriers to adoption. In addition, problems with mobile devices, such as limited memory and central processor unit (CPU) size, small screens, low bandwidth and erratic connections, are further adoption barriers.

Lately, mobile network operators and equipment manufacturers have tried to address some of the issues identified as barriers to adoption through specials, bundles and price reductions.

Harker and van Akkeran's findings (2002) also show that consumers are not interested in the architecture, standardisation issues or technical functioning of the technologies. What they require is a device that works and provides effective access to the content that they want to access, with communication applications personalised to their individual needs.

In general, most companies felt the relationship between network operators and WASPs is good, even though at times it can be strained due to the increased competition between them.

Some indicated that the competition forces them not to liaise on a lot of issues for fear of compromising their competitive advantage. But others felt that they, as WASPs, specialise in content creation and product/service development and how best to market it, and that therefore network operators should focus on selling airtime and be open to ideas that will increase ARPU and hence revenue. It was felt that they should stop acting like gatekeepers by dictating to the market what

should and should not be launched. As Alan Knott Craig, the Chief Executive of Vodacom, is fond of saying, the key to successful distribution models is to allow the middleman to make a buck (Vodafone, 2004).

These findings are in line with a study conducted by Jonason and Eliasson (2001), who showed that there is a considerable advantage for mobile operators in being able to leverage their monopoly on end-user access and charging to gain the lion share of the revenue. They assert that content and wireless application service providers are also clearly an important contributor in the mobile communication value chain. They create value for the customer and thereby encourage airtime usage and diversification for the mobile operator faced with declining average revenue per user.

Jonason concludes by emphasising the rationale of sharing information and incentives on pricing strategies with both providers and customers, arguing that by sharing information on its pricing strategy the operator increases the receivers' competence of its customers and thus reduces uncertainty on how to price. Furthermore, a shared pricing base with providers (revenue sharing) is likely to reduce the incentive for the supply side (provider) to bypass the role of the operator through Internet protocol and invent an alternative base for charging.

He also contends that success in this industry will mean getting to market quickly, armed with the right applications and the right services. However, mobile operators will need to do this with partners. They must develop new ways to address their relationships with customers, vendors, applications developers, content providers and service providers. This includes entering risk sharing arrangements with equipment vendors and application developers, and opportunity sharing arrangements with information and content providers.

Jonason further argues that operators tend to be myopic in their pricing contracts towards the content providers, and thus reduce their incentive to continue to contribute value. According to him the owner of the valuable entity (in this case,

the content providers/WASP/SP) and the owner of the chargeable entity (in this case, the network operator) are two separate companies and, therefore, need to agree on a pricing contract such as for the delivery of the content and applications to the mobile devices, typically news, banking and entertainment services. The providers of the content and applications contribute value to the service, but rely on the network operator to charge the end user. The same argument is also put forward by some of the respondents.

6.5 Conclusions

The results indicate that most respondents were aware of many of the mobile data services offered by the mobile network operators. These findings are in line with a survey conducted by Hamilton *et al.* of the BMI-T group in 2006 which showed that South Africa is already edging into the early majority phase of emerging digital media adoption and that South Africans of all ages, but particularly the younger generation, love their PC and cellular devices, not only for work purposes but for all types of entertainment.

The results also confirm that black South Africans are rapidly closing the technology adoption rates between them and whites, Indians and coloureds in respect of access to mobile data services.

Most respondents would prefer to receive information about these services through their service providers as opposed to the current method of receiving information via the television.

The use of cellular phones to access the Internet and/or e-mail tends to increase with an increase in the level of income for income levels less than R20 000. Those who earn R20 000 and above tend to use the cellular phone less to access the Internet and/or e-mail. The daily usage of a cellular phone to access the Internet and/or e-mail for social purposes tends to decrease with the increase in the level of income.

Most of the respondents indicated that if they had extra money to spend on mobile broadband services they would spend it on the following in order of priority: mobile Internet and/or e-mail using a laptop, SMS and MMS, and mobile Internet and/or email using a cellular phone. These were followed by those who said that they would spend the money on airtime transfer, banking services, information and directory services, downloads, video messaging, etc.

The results also show that there is a sizable percentage of potential users who could use these services if they had more information about them, and if their concerns were addressed.

The major reasons that respondents signed up for mobile broadband Internet services were because they wanted an always-on connection anytime, anywhere, as well as faster speed when accessing e-mail and other services or when downloading data from the Internet. Lastly, they wanted the advantage of mobility.

Most of the respondents said they would use mobile broadband Internet service if:

- It cost less to use;
- The speed was faster;
- The service was easy to use, as on the PC or a laptop;
- The cellular phone had a larger screen;
- The cellular phone used less battery power; and
- The keyboard was larger.

The aesthetics and battery power are not important to most respondents; they are more concerned about cost, speed and ease of use.

Most respondents thought that SMS was the most reliable and easy to use service, followed by accessing Internet using a laptop, and then balance inquiry or airtime transfer.

Most respondents thought the price of mobile broadband services was too high. Some were concerned about the security of the connection when using some of the services and those that have never used these services thought it would be difficult or complex to set up a cellular phone to access the services.

Most respondents indicated that content is too expensive and that the cost to access services (i.e. the cost of cellular phone, data cards and laptops) is seen as a limitation to both the low and middle income bracket groups. The issue of cost was also seen as a barrier for exploiting opportunities in the lower and medium income bracket groups, but most respondents thought that with time the cost would come down sufficiently for them to exploit the huge opportunities in these markets.

The slow speed of accessing services, network performance and coverage were also seen as a barrier in exploiting business opportunities brought about by the mobile broadband technology.

Cost was also seen as a barrier to exploiting opportunities in the lower and medium income bracket groups, but most companies thought that with time the cost would come down far enough for them to exploit the huge opportunities in these markets.

Even though some respondents indicated that they involved or received input from the subscribers and/or potential subscribers through focus groups, concept testing, blind discussion groups, telephone interviews, usability groups and market research when planning, developing, or introducing new services, it is clear from the findings that this is not always done. If it is done, it is not intensive, especially if services do not require significant capital investment. Generally, companies make predictions about the market based on their knowledge of the consumer segments and matched with global trends or assumed behaviour.

Most companies conceded that some of the services they provided are not originally from South Africa, as they are copied from overseas and adopted for the South African market. Some companies do not even know the content consumption patterns in the low income market.

Most of the respondents have never used the cellular phone to watch mobile television. This could be because this is a new service and most people do not have the right cellular phones (digital video broadcasting for handheld [DVBH] compatible phones), because they are not readily available.

Most companies felt the relationship between network operators and WASPs is good, even though at times it can be strained by the increased competition between them. Certain companies indicated that the competition forces them not to liaise on a lot of issues for fear of compromising their competitive advantage. Others felt that they, as WASPs, specialise in content creation and product/service development and how best to market it, and that therefore network operators should focus on selling airtime and be open to ideas that would increase ARPU.

Most companies felt that the bulk of the money should go to whoever takes the most risk. The difference was on agreeing about who carries the most risk.

Most companies felt that the content provider should get at least fifty to sixty percent of the revenue, whilst the other forty to fifty percent should be shared by the rest of the distribution value chain. One network operator felt that the revenue model is fine as it is. Since they own the customers, the network, the distribution network, the billing systems and the support infrastructure they must get the biggest share.

Three models of sharing the revenue were suggested:

- The network operator takes fifty percent and the content provider and/or WASP take the other fifty percent;

- The content provider takes sixty percent, the network operator takes thirty percent and the WASP takes ten percent where they act only as facilitators; and
- Where there is no risk shared, a fixed fee is more appropriate e.g. R1.50 per ringtone and not fifty percent of the amount charged, say R10.00.

In general the following conclusions can also be drawn:

- There is an unmet demand for mobile data services in South Africa;
- Mobile data services are reliable, slow, difficult to use and expensive;
- Subscribers or potential subscribers are aware of most mobile data services offered by the Mobile Cellular Network Operators; and
- The strategic partnership between Mobile Cellular Network Operators, Content Providers and Wireless Applications Service Providers is good, even though at times it can be strained by the increased competition between them.

6.6 Recommendations

Service providers should learn more about the needs of the market segments that they serve. New services should be promoted to different segments of the market in ways that appeal to those demographics. By opening up the service to the widest possible audience and segmenting customers with targeted marketing and communications strategies, maximum penetration can be achieved.

Network operators, WASPs and service providers should continuously perform market research and use data warehousing and data mining techniques to gain greater insight into the prediction of consumer purchase behaviour. This would assist in developing home-grown, useful, easy to use and cheap services tailored for different market segments, instead of copying, adopting and dumping first world services on customers who might have other priorities and interests.

Network operators, WASPs and service providers should involve the users to improve the effectiveness of new service development, gain a deeper understanding of their needs, and to increase the likelihood that the new service ideas will meet those needs.

Service providers should adopt multichannel strategies in order to reach a higher proportion of customers. Some distribution channels are better at reaching certain types of customers as each channel has unique offerings that fulfil each customer's need. Each channel attracts a specific type of customer, and so some customers may not approach the firm if that type of channel is unavailable.

Network operators should regard service providers and WASPs as their complementors (participants from which customers buy complementary products and services, or to which suppliers sell complementary resources) and not competitors. They should, therefore, stop competing for the same subscribers but instead should build trusting partnerships with them, in order to develop and offer content and simple, easy to use services at the right price.

Network operators, WASPs, service providers and mobile equipment suppliers should continue to bring down the cost to access and use services so as to exploit the huge opportunities in the low to middle income bracket group.

Network operators and WASPs should adapt their existing business models in order to provide real, relevant benefits to the customers, and generate multiple sources of revenue through commercial transactions with third parties.

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8 Appendices

8.1 General Questionnaire

Dear respondent,

My name is **Potsane Malebanye**. As part of my final year **UNISA MBL programme (thesis)**, I am conducting a survey amongst selected individuals to investigate how Mobile Cellular Network Operators can increase the average revenue per user by stimulating the usage of broadband services. The survey will take **approximately 6 minutes of your time**. Please answer the following questions.

1.1 Please indicate whether you are male or female.

Q	Male	Female
1	1	2

1.2 Please indicate which age bracket you fall into.

Q	< 16	16-20	21-25	26-30	31-35	36-40	41-45	46-50	51-55	56-60	61-65	66+
2	1	2	3	4	5	6	7	8	9	10	11	12

1.3 Please indicate your occupation.

Q	Student	Full-time employed	Part-time employed	Self-employed	Unemployed and still looking for employment	Unemployed and not looking for employment
3	1	2		3	4	5

1.4 Please indicate your source of income.

Q	Parents, relatives, friends	Wages from my employers	Self-employment	Investments	Grants	Other. Please specify
4	1	2	3	4	5	6

1.5 Please indicate your estimated monthly income.

Q	Less than R5,000	R5,000 to less than R10,000	R10,000 to less than R15,000	R15,000 to less than R20,000	More than R20,000
5	1	2	3	4	5

1.6 Please indicate your race group.

Q	Asian	Black	Coloured	White	Other – Please Specify:
6	1	2	3	4	5

1.7 Please indicate your level of education.

Q	Less than St. 8 (less than Grade 10)	St. 8 to St. 9 (Grade 10 to 11)	Matric (Grade 12)	Training school/ Technikon	University degree	University post graduate degree
7	1	2	3	4	5	6

1.8 Please indicate your home language.

Q	English	Afrikaans	An African language Specify:	Other Specify:
8	1	2	3	4

1.9 Please indicate which of the following mobile data services you are aware of and which you are not aware of.

Q		Aware of	Not aware of
	On cellular phone		
9	Remote access: Internet and/or e-mail	1	2
10	Balance enquiry, Airtime transfer	1	2
11	Downloading pictures, video clips, ringtones, music, etc.	1	2
12	Interactive chatrooms like Mxit, facebook etc	1	2
13	Information and directory services: news, traffic, weather, stock prices, horoscopes, sports scores, train times, restaurant guide, dictionary, recipe, etc	1	2
14	Send & receive SMS and MMS	1	2
15	Video messaging	1	2
16	video calling	1	2
17	Mobile banking, ticket purchasing, Accounts payment	1	2
18	stock trading, m-commerce	1	2
19	Mobile TV	1	2
20	Entertainment: gambling, chat, jokes, etc	1	2
	On computer (laptop)		
21	Mobile Internet and/or e-mail	1	2
	Other		
22	Retail/POS: credit card authorisation, lottery.	1	2
23	Telematics and Telemetry: remote automotive diagnostics, vending machines, car parking meters	1	2

2.1 Please indicate **what for (business or social) and how often** do you use the following mobile data services.
Note: Skip the service if you are not familiar with it or do not use it.

Q	On cellular phone	Q	For business purposes					Q	For social purposes				
			Never	Less than monthly	Monthly	Weekly	Daily		Never	Less than monthly	Monthly	Weekly	Daily
24	Remote access: Internet and/or e-mail	24.1	1	2	3	4	5	24.2	1	2	3	4	5
25	Balance enquiry, Airtime transfer	25.1	1	2	3	4	5	25.2	1	2	3	4	5
26	Downloading pictures, video clips, ringtones, music, etc.	26.1	1	2	3	4	5	26.2	1	2	3	4	5
27	Interactive chatrooms like Mxit, facebook etc	27.1	1	2	3	4	5	27.2	1	2	3	4	5
28	Information and directory services: news, traffic, weather, stock prices, horoscopes, sports scores, train times, restaurant guide, dictionary, recipe, etc	28.1	1	2	3	4	5	28.2	1	2	3	4	5
29	Send & receive SMS & MMS	29.1	1	2	3	4	5	29.2	1	2	3	4	5
30	Video messaging	30.1	1	2	3	4	5	30.2	1	2	3	4	5
31	Video calling	31.1	1	2	3	4	5	31.2	1	2	3	4	5
32	Mobile banking, ticket purchasing, Accounts payment	32.1	1	2	3	4	5	32.2	1	2	3	4	5
33	stock trading, m-commerce	33.1	1	2	3	4	5	33.2	1	2	3	4	5
34	Mobile TV	34.1	1	2	3	4	5	34.2	1	2	3	4	5
35	Entertainment: gambling, chat, jokes etc	35.1	1	2	3	4	5	36.2	1	2	3	4	5
	On computer (laptop)												
36	Internet and/or e-mail	36.1	1	2	3	4	5	36.2	1	2	3	4	5
	Other												
37	Retail/POS: credit card authorisation, lottery.	37.1	1	2	3	4	5		1	2	3	4	5
38	Telematics and Telemetry: remote automotive diagnostics, vending machines, car parking meters	38.1	1	2	3	4	5		1	2	3	4	5

2.2 If you had extra money to spend on mobile data services and had the correct equipment, please rank on a scale of 1 to 5, with 5 representing “**most important**” and 1 representing “**least important**”, how you would spend your money on the following services. Note: Skip the service if you are not familiar with it or do not use it.

Q	On cellular phone					
38	Remote access: Internet and/or e-mail	1	2	3	4	5
39	Balance enquiry, Airtime transfer	1	2	3	4	5
40	Downloading pictures, video clips, ringtones, music, etc.	1	2	3	4	5
41	Interactive chatrooms like Mxit, facebook etc	1	2	3	4	5
42	Information and directory services: news, traffic, weather, stock prices, horoscopes, sports scores, train times, restaurant guide, dictionary, recipe, etc	1	2	3	4	5
43	Send & receive SMS & MMS	1	2	3	4	5
44	Video messaging	1	2	3	4	5
45	Video calling	1	2	3	4	5
46	Mobile banking, ticket purchasing, Accounts payment	1	2	3	4	5
47	stock trading, m-commerce	1	2	3	4	5
48	Mobile TV	1	2	3	4	5
49	Entertainment: gambling, chat, jokes etc	1	2	3	4	5
	On computer (laptop)					
50	Internet and/or e-mail	1	2	3	4	5
	Other					
51	Retail/POS: credit card authorisation, lottery.	1	2	3	4	5
52	Telematics and Telemetry: remote automotive diagnostics, vending machines, car parking meters	1	2	3	4	5

2.4 If you have no Internet connectivity (work & home) but do not use your cellular phone to access the internet, why is that so?

.....

2.5 If you have Internet access and you use mobile broadband Internet service, which of the following reasons encouraged you to sign up?

53	Wanted a more reliable connection	1
54	Wanted to free up the fixed line phone	2
55	Wanted an always-on connection, anytime, anywhere	3
56	Wanted faster speed for accessing e-mail and other services	4
57	Wanted faster speed and the advantage of mobility	5
58	Wanted faster speed when downloading information on the internet	6
59	Wanted faster speed for playing games	7
60	Was offered a discount on the broadband services	8
61	Was offered a discount package (bundle) on mobile broadband and other services	9
62	My service provider encouraged me to subscribe for mobile broadband services	10
63	Was encouraged by friends to use it	11
64	Other. <i>Please specify:</i>	

2.6 If you do not have mobile broadband Internet access, how much do you agree or disagree with the following statements about broadband.

65	I don't understand what broadband services are	1
66	I don't see any reason why I need it	2
67	I have high-speed Internet access at the office	3
68	I think the price is too high	4
69	I am concerned that it will be too difficult or complex to set up	5
70	I'm concerned about the security of a broadband connection	6
71	Other. <i>Please specify:</i>	

2.7 How much do you agree or disagree with the following statements about the Internet on a mobile phone? "I would use the mobile Internet on my cell phone more frequently..."

72	If the speed was faster	1
73	If my phone had a larger keyboard	2
74	If my phone had a larger screen	3
75	If it cost less to use	4
76	If it was easy to use like on the PC or laptop	5
77	If it used less battery power	6
78	Other. <i>Please specify:</i>	

2.8 Are there any mobile data services that are, according to your knowledge, not currently available in the market that you wish you could access through your Cellular Phone? If so, please mention what these services might be.

Q	Business Convenience Services		Entertainment Convenience Services		Social Convenience Services	
79	79.1		79.2		79.3	
80	80.1		80.2		80.3	
81	81.1		81.2		81.3	
82	82.1		82.2		82.3	

2.9 How do you get to know about new mobile data services that are available in the market?

Q	I get information through the following:	
83	TV	1
84	Radio	2
85	Print media	3
86	My Service Provider	4
87	Friends	5
88	Other: <i>Please mention</i>	

3.0 How would you prefer to get notified about new data service?

Q	I prefer to get information through the following	
89	TV	1
90	Radio	2
91	Print media	3
92	My Service Provider	4
93	Friends	5
94	Other: <i>Please mention</i>	

3.1 Please rate the reliability of the following mobile data services on a scale of 1 to 5, where 5 = works all the time and 1 = works very poorly. Note: Skip the service if you are not familiar with it or do not use it.

Q	On cellular phone					
95	Remote access: Internet and/or e-mail	1	2	3	4	5
96	Balance enquiry, Airtime transfer	1	2	3	4	5
97	Downloading pictures, video clips, ringtones, music, etc.	1	2	3	4	5
98	Interactive chatrooms like Mxit, facebook etc	1	2	3	4	5
99	Information and directory services: news, traffic, weather, stock prices, horoscopes, sports scores, train times, restaurant guide, dictionary, recipe, etc	1	2	3	4	5
100	Send & receive SMS & MMS	1	2	3	4	5
101	Video messaging	1	2	3	4	5
102	Video calling	1	2	3	4	5
103	Mobile banking, ticket purchasing, Accounts payment	1	2	3	4	5
104	stock trading, m-commerce	1	2	3	4	5
105	Mobile TV	1	2	3	4	5
106	Entertainment: gambling, chat, jokes etc	1	2	3	4	5
	On computer (laptop)					
107	Internet and/or e-mail	1	2	3	4	5
	Other					
108	Retail/POS: credit card authorisation, lottery.	1	2	3	4	5
109	Telematics and Telemetry: Remote automotive diagnostics, vending machines, car parking meters	1	2	3	4	5

3.2 Please rate how secure (safe) the following mobile data services are on a scale of 1 to 5, where 5 = very safe to use and 1 = not safe to use. Note: Skip the service if you are not familiar with it or do not use it.

Q	On cellular phone					
110	Mobile banking, ticket purchasing, Accounts payment	1	2	3	4	5
111	Stock trading, m-commerce	1	2	3	4	5
	On computer (laptop)					
112	Internet Banking	1	2	3	4	5
	Other					
113	Retail/POS: Credit card authorisation, lottery.	1	2	3	4	5

3.3 Please indicate how easy it is to access the following services using your cellular phone? On a scale of 1 to 5, where 5 = very easy to use and 1 = not easy to use. Note: Skip the service if you are not familiar with it or do not use it.

Q	On cellular phone					
114	Remote access: Internet and/or e-mail	1	2	3	4	5
115	Balance enquiry, Airtime transfer	1	2	3	4	5
116	Downloading pictures, video clips, ringtones, music, etc.	1	2	3	4	5
117	Interactive chatrooms like Mxit, facebook etc	1	2	3	4	5
118	Information and directory services: news, traffic, weather, stock prices, horoscopes, sports scores, train times, restaurant guide, dictionary, recipe, etc	1	2	3	4	5
119	Send & receive SMS & MMS	1	2	3	4	5
120	Video messaging	1	2	3	4	5
121	Video calling	1	2	3	4	5
122	Mobile banking, ticket purchasing, Accounts payment	1	2	3	4	5
123	stock trading, m-commerce	1	2	3	4	5
124	Mobile TV	1	2	3	4	5
125	Entertainment: gambling, chat, jokes etc	1	2	3	4	5

3.4 Please rate your opinion about the speed (how fast the menus appear, the time it takes to browse between pages for some services, and the time it takes to send and receive for some services) of the following mobile data services on a scale of 1 to 5, where 5 = very fast and 1 = slow and irritable. Note: Skip the service if you are not familiar with it.

Q	On cellular phone					
126	Remote access: Internet and/or e-mail	1	2	3	4	5
127	Balance enquiry, Airtime transfer	1	2	3	4	5
128	Downloading pictures, video clips, ringtones, music, etc.	1	2	3	4	5
129	Interactive chatrooms like Mxit, facebook etc	1	2	3	4	5
130	Information and directory services: news, traffic, weather, stock prices, horoscopes, sports scores, train times, restaurant guide, dictionary, recipe, etc	1	2	3	4	5
131	Send & receive SMS & MMS	1	2	3	4	5
132	Video messaging	1	2	3	4	5
133	Video calling	1	2	3	4	5
134	Mobile banking, ticket purchasing, Accounts payment	1	2	3	4	5
135	stock trading, m-commerce	1	2	3	4	5
136	Mobile TV	1	2	3	4	5
137	Entertainment: gambling, chat, jokes etc	1	2	3	4	5

3.5 Please rate the cost of the following mobile data services on a scale of 1 to 5, where 5 = very expensive and 1 = cheap. Note: Skip the service if you are not familiar with it.

Q	On cellular phone					
138	Remote access: Internet and/or e-mail	1	2	3	4	5
139	Balance enquiry, Airtime transfer	1	2	3	4	5
140	Downloading pictures, video clips, ringtones, music, etc.	1	2	3	4	5
141	Interactive chatrooms like Mxit, facebook etc	1	2	3	4	5
142	Information and directory services: news, traffic, weather, stock prices, horoscopes, sports scores, train times, restaurant guide, dictionary, recipe, etc	1	2	3	4	5
143	Send & receive SMS & MMS	1	2	3	4	5
144	Video messaging	1	2	3	4	5
145	Video calling	1	2	3	4	5
146	Mobile banking, ticket purchasing, Accounts payment	1	2	3	4	5
147	stock trading, m-commerce	1	2	3	4	5
148	Mobile TV	1	2	3	4	5
149	Entertainment: gambling, chat, jokes etc	1	2	3	4	5
	On computer (laptop)					
150	Internet and/or e-mail	1	2	3	4	5
	Other					
151	Retail/POS: credit card authorisation, lottery.	1	2	3	4	5
152	Telematics and Telemetry: remote automotive diagnostics, vending machines, car parking meters	1	2	3	4	5

3.6 Please indicate which of the following you can do on your cellular phone?

Q	On cellular phone	
153	Send SMS	1
154	Take photos	2
155	Send video messages	3
156	Access the internet	4

3.7 Please rate on a scale of 1 to 5, whether you think cellular phones that can perform the following tasks are expensive or not, where 5 refers to very expensive and 1 refers to cheap.

Q	On cellular phone					
157	Send SMS	1	2	3	4	5
158	Take photos	1	2	3	4	5
159	Send video messages	1	2	3	4	5
160	Access the internet	1	2	3	4	5

8.2 Questionnaire for Network Operators, WASPS and SPs

Dear respondent,

My name is **Potsane Malebanye**. As part of my final year **UNISA MBL programme (thesis)**, I am conducting a survey amongst selected individuals to investigate how Mobile Cellular Network Operators can increase the average revenue per user by stimulating the usage of broadband services. The survey will take **approximately 6 minutes of your time**. Please answer the following questions.

1. Please indicate into which category (or categories) your business falls:

Network Operator	Service Provider	WASP	Content Provider
1	2	3	4

2. Please list some or all of your mobile data or wireless applications services/products and indicate your target market (according to income level), where 3 = High Income market, 2 = Middle Income market, and 1 = Low Income market

Mobile data/wireless service that you provide	Target Market (Income Level)
	1
	2
	3
	1
	2
	3
	1
	2
	3

3. Do you provide any services/products that are not originally from South Africa (i.e. that originate somewhere else but have been adopted for the South African market)?

Yes	No
-----	----

4. Do you provide any content that does not originate from South Africa?

Yes	No
-----	----

5. On a scale of 1 to 5, where 5 = very suited for the low and medium income bracket group and 1 = not suited for the low and medium income bracket group, how suitable are your services/products for the low and medium income bracket group?

1	2	3	4	5
---	---	---	---	---

6. If in the above question your rating of suitability of your services/products for the low and medium income bracket group is below 3 (1 or 2), why do you say that your services/products are not suited for this market?

.....

.....

.....

.....

7. In developing, deciding to introduce, or planning new mobile data products/services do you involve or get input from subscribers or potential subscribers?

Yes	No
-----	----

8. If the answer to question above is positive, how do you include subscribers or potential subscribers when developing new products/services?

.....

9. In developing, deciding to introduce, or planning new mobile data products/services, do you share any market information or collaborate in market research with Mobile Cellular Network Providers and/or Wireless Applications Service Providers and/or Content Providers to understand the markets for the common benefit of all?

My company shares market information with the following:	Network Providers	Yes
		No
	WASPs	Yes
		No
	Content Providers	Yes
		No
My company collaborates with the following in market research:	Network Providers	Yes
		No
	WASPs	Yes
		No
	Content Providers	Yes
		No

10. Before developing a product/service do you do any market research?

Yes	No
-----	----

11. If the answer to the previous question is negative, how do you decide on whether to develop a product/service and to launch it?

.....

12. The cost of mobile cellular phone usage is considered expensive. In many mature mobile markets, this is no longer true and we are beginning to see increasing levels of substitution of fixed phones by mobile phones. However, pricing still remains one of the key market drivers for mobile technology. Please answer the following questions regarding this:

Do you believe that the cost of mobile cellular phone usage is expensive in South Africa?	Yes	No
Do you believe that the cost of mobile usage will come down enough in South Africa for your company to exploit the huge opportunities in the low and medium income bracket groups?	Yes	No
Do you believe that the cost of your services/products is a barrier to exploiting business opportunities in the low and medium income bracket group?	Yes	No
Do you believe that the price of appropriate cellular phones, and not the cost of your services/products, is the barrier to exploiting business opportunities in the low and medium income bracket group?	Yes	No

13. A high number of those in the low and medium income bracket group operate their own businesses. Have you ever considered these entrepreneurs as a market for mobile data services?

Yes	No
-----	----

14. Please answer the following questions regarding Mobile Cellular Network Operators

Do you believe that the speed of accessing services offered by service providers is slow?	Yes	No
Do you believe that the network performance (coverage and reliability) is a barrier to exploiting business opportunities brought about by the broadband technology?	Yes	No

15. How would you describe your relationship with network operators/WASPs/service providers and if it not good how can it be improved?

.....
.....
.....

16. Do you think that the strategic partnership between Mobile Cellular Network Operators, Content Providers, and Wireless Applications Service Providers could work to the benefit of all and stimulate usage of mobile data services in the low and medium income bracket group?

Yes	No
-----	----

17. If your answer to the above question is yes, what, over and above what is contained in this questionnaire, can be done to unlock business for your services in the low and medium income bracket group?

.....
.....
.....

18. What do you think of the current revenue sharing model used by Network Operators//WASP's and content providers?

.....
.....
.....

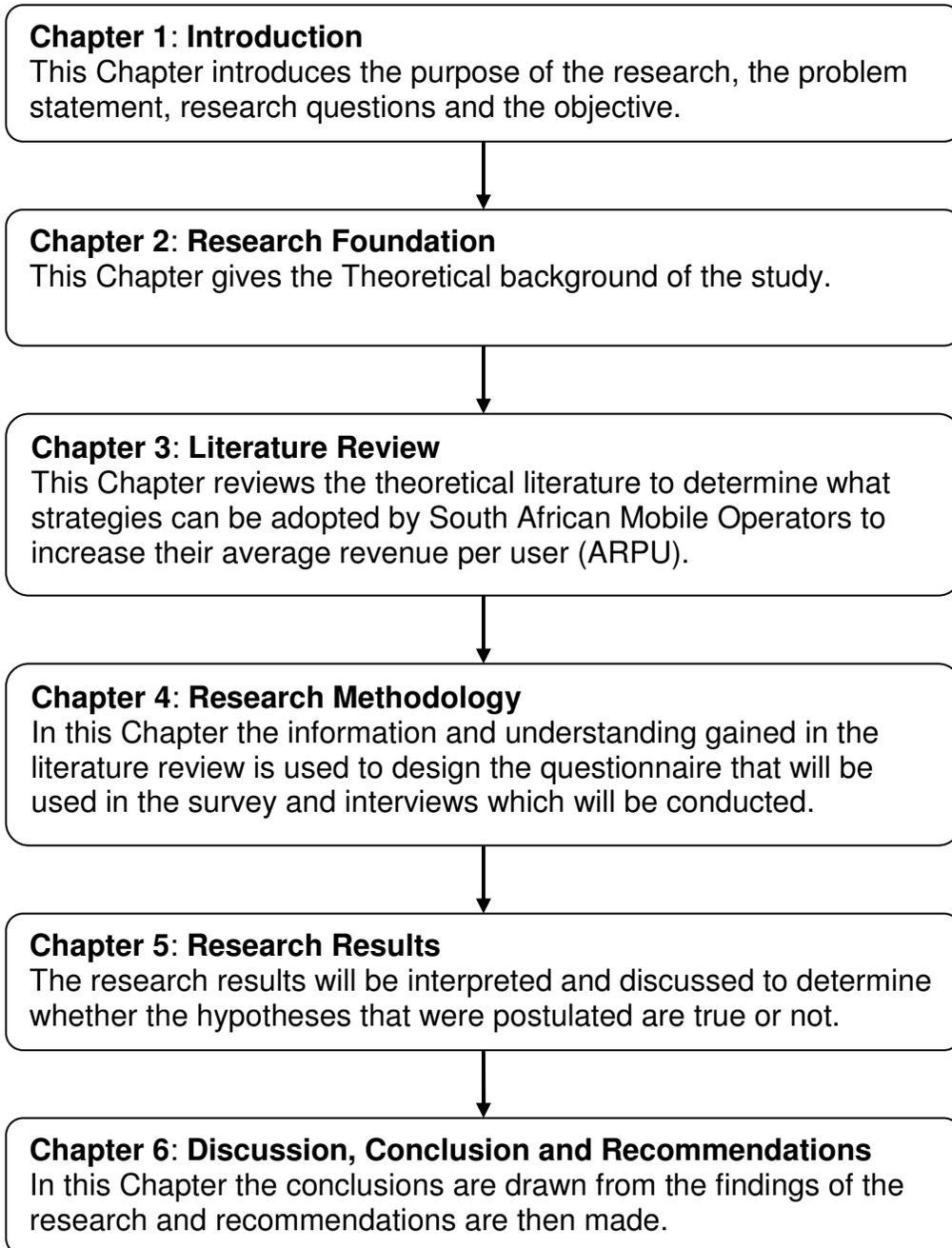
19. Who do you think should get the bulk of the revenue generated in this relationship and why?

.....
.....
.....

9 Article for Publication

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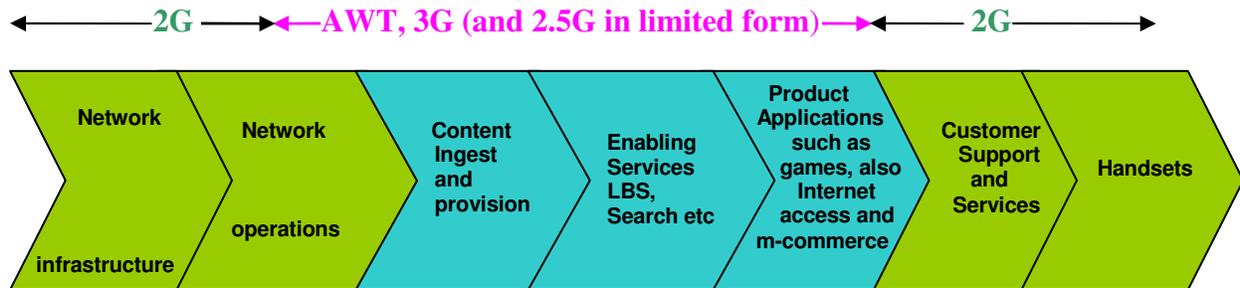
1. Figure 1.1: outline of the research report



Source: Adopted from Dursun and Gökbayrak, 2000

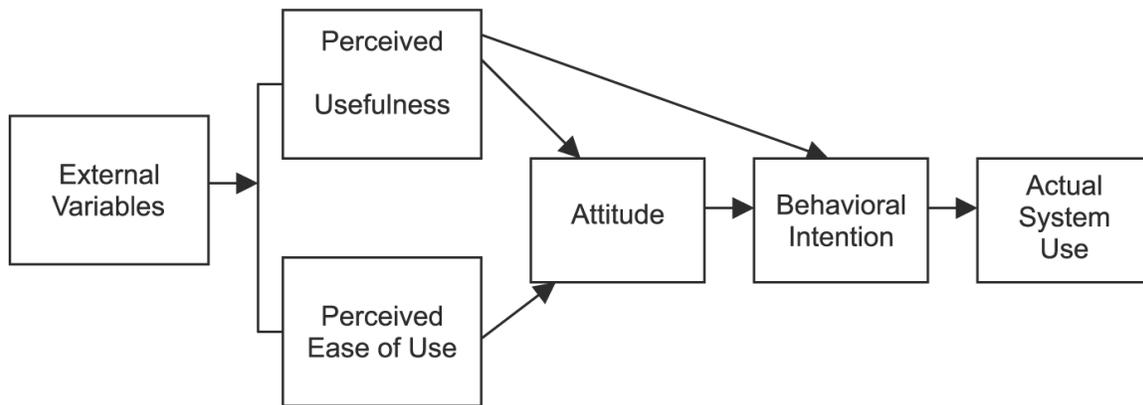
2. Figure 2.1: Future Telecommunication Value Chain.

There is a new mobile service operational chain in 3G cellular, AWTs such as WiFi and in a more limited form 2.5G.



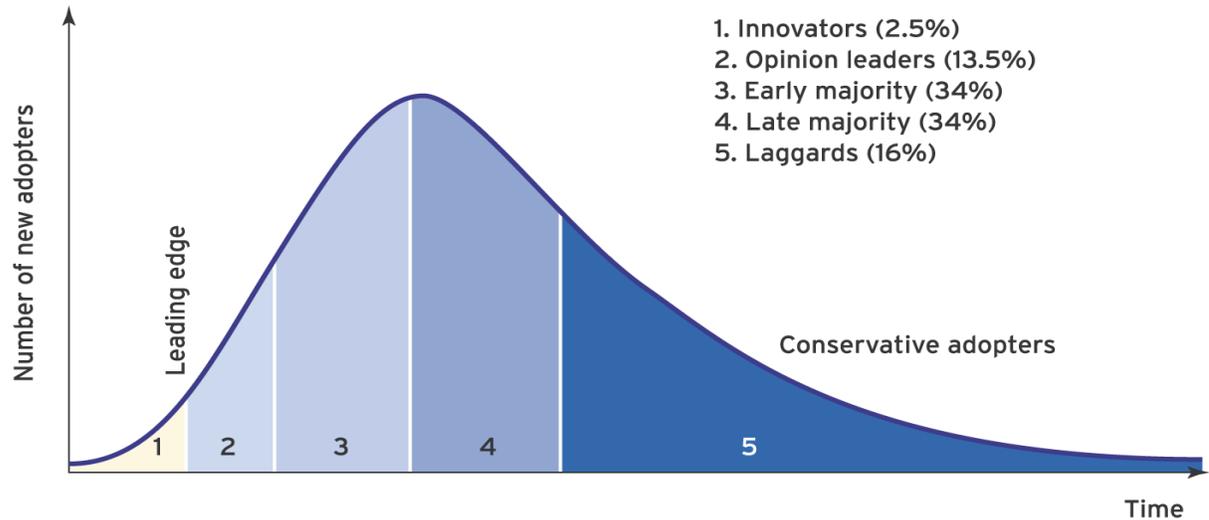
Source: Bohlin et al., 2005

3. Figure 3.1: The Technology acceptance model



Source: Lu et al., 2003.

4. Figure 3.2: Typical diffusion of innovation curve



Source: e-Business and Technology Management Lecture notes, 2007

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G Frey	Product Portfolio Manager - Data	Cell-C
S Naidu	Managing Member (Finance & Adm.)	Badboys
P Sharawakanda	Director Business Development	Cell-C
PJ Phike	General Manager Carrier Service	MTN
J Joffe		Teljoy
W Yell	EHoD: Product Research & Development	Vodacom
G Porter	Manager: New product development	Vodacom
R Steenberg	Manager: Products & Services	Vodacom

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