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Mobile operator strategies to reach low-income communities in South Africa

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2014
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Mobile Operator Strategies to Reach Low-Income Communities in South Africa

A research report submitted by

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14 October 2014

Abstract

The purpose of this research is to identify specific strategies adopted by mobile telecommunications operators in South Africa to reach low income communities in a profitable and sustainable manner.

The first sub-problem is to identify specific strategies adopted by mobile telecommunications operators in South Africa. The second sub-problem is to justify the appropriateness of specific strategies adopted by mobile telecommunications operators in South Africa to reach low income communities in a profitable and sustainable manner.

Mobile Operator Strategy in South Africa has focused on subscriber acquisition, growing and maintaining market share, revenue growth and operational efficiency. End-user success factors focusing on innovative end-user services have been the biggest factors enabling financial success for Mobile Network Operators (MNOs) in South Africa.

Supporting success factors for example regulatory compliance and corporate social responsibility have played a role in supporting the financial success factors for South African MNOs.

The research includes a study of the Mobile Operators strategy up to present and considers alternative MNO strategies, considering future industry developments including future new revenue streams like M-Commerce and Media and threat of substitutes in the form of over-the-top players.

Key findings in this research are that both MNOs studied have proved to have similar strategies to reach low-income communities, focussing on innovative end-user offerings that generate revenues. Future developments in the telecommunications industry where over-the-top service providers like Google, Facebook and Apple are emerging will need operators to rethink their approach to the market in order to maintain the potential industry revenue growth.

Declaration

I, Brian David Arendse, declare that this research is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the University of the Witwatersrand, Johanesburg. It has not been submitted for any degree or examination in this or any other university.

Brian Arendse

Signed at …….

On the ……. day of ……. 2014

Dedication

This report is dedicated to my family: my wife Eulaine for her continuous support and encouragement, my son Caleb and daughter Caitlin for the hours sacrificed.

Acknowledgements

I would like to thank the following people for their assistance and support:

- Mark Peters for his time, patience, encouragement, insights and openness,
- Jamie Anderson for his academic insights on the topic and industry,
- Prof Fred Ahwireng-Obeng and Prof Geoff Bick for their insights during panel,
- Prof Terri Carmichael for research methodology and results presentation support,
- My managers at Ericsson for the financial support and enabling me time off to complete my studies,
- My classmates for their encouragement to complete the research and
- My family who sacrificed their time for me to complete the research.

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1 INTRODUCTION

1.1 Purpose of the study

The purpose of this research is to identify specific strategies Mobile Telecommunications Network operators (MNO) in South Africa are adopting to reach low income communities in a profitable and sustainable manner.

1.2 Context of the study

Mobile communication networks like Global System for Mobile Communication (GSM) have been around since the early 1990's. Technological advances have seen the introduction of new services like Short Messaging Service (SMS) and mobile data services based on General Packet Radio Service (GPRS) and Third Generation Mobile systems (3G). In addition to innovative technology, end-user services introduced by MNOs have also introduced innovation.

This study investigates and compares emerging-market MNO strategies and their impact on end-users. The impact of specific strategies on MNOs revenues and expenses is investigated.

1.3 Problem statement

1.3.1 *Main problem*

The purpose of the research is to identify specific strategies adopted by mobile telecommunications operators in South Africa to reach low income communities in a profitable and sustainable manner.

1.3.2 *Sub-problems*

The first sub-problem is to identify specific strategies adopted by mobile telecommunications operators in South Africa.

The second sub-problem is to justify the appropriateness of specific strategies adopted by mobile telecommunications operators in South Africa to reach low income communities in a profitable and sustainable manner.

1.4 Significance of the study

The study fills a gap in that it benchmarks the strategies taken by different MNOs. Due to the subscriber number penetration in the mature Western European markets, MNO strategy in developed markets are similar, namely to reduce subscriber churn and offer end-user services that could attract and retain consumers (Yin 1994; Hamdouch and Samuelides 2001; Tsuboya 2003; Fraunholz and Unnithan 2004; Henten, Falch and Tadayoni 2004; Stienstra, Baaij, Van den Bosch and Volberda 2004; Peppard and Rylander 2006). Additionally, there have been MNO strategy case studies completed in Latin America and Asia (Barrantes, Galperin, Agüero and Molinari 2007; Galperin and Mariscal 2007; Mallalieu 2007; Anderson and Kupp 2008). Mobile Operator strategies in South Africa have not been widely studied.

The study is not limited to a single operator but rather compares the approaches of different operators that have not been benchmarked against others previously in this way. The dynamic nature of the mobile communications industry in South Africa gives researchers the possibility to conduct research from different angles. Operators in South Africa have been used in this study.

Available literature on Mobile Communication in emerging markets focuses on mobile communications as a driver for economic development and studies have used end-users of mobile networks as the main source for research material (Barrantes et al. 2007), (Botelho and Da Silva Alves 2007) , (Cecchini 2003), (Donner 2008) and (Galperin and Mariscal 2007). This study approaches the topic of mobile communication in South Africa from the MNO perspective.

The study provides guidance to mobile operators on strategies available to reach low-income communities. This includes strategies closely linked to development and refining of mobile operator business cases and end-user product offerings. Top MNO strategies are compared and benchmarked and MNO best-practices are noted. A set of strategy

recommendations are drawn up based on this study that could guide MNOs in South Africa regarding strategy formulation and implementation.

Additionally, this study provides guidance to Mobile Telecommunications vendors who are responsible for supply and delivery of goods and services to Mobile Network Operators (MNO) to target specific products that will contribute to MNOs reaching customers in a profitable and sustainable manner. The findings relevant to vendors are drawn up as a set of recommendations for future profitable business with MNOs.

1.5 Delimitations and limitations

1.5.1 *Delimitations*

This study focuses on the MNO strategy perspective in South Africa. Vendor strategies are not considered in this research. As far as possible, management, not technical or operational issues is the focus of the study.

1.5.2 *Limitations*

Potential weaknesses include:

- the bias of data to a certain MNO or group of MNOs,
- the lack of broad knowledge of participants to be interviewed and
- the author's own bias towards mobile vendors.

Methodological limitations include:

- Inability to obtain generalisations due to limited number of cases or limited time available to gather data.
- Descriptive information obtained during data collection may not be conclusive due to qualitative nature of research (Cresswell 2003; Noor 2008).

1.6 Definition of terms

Mobile Network Operators (MNO) refer to companies in the business of deriving revenue from offering mobile voice and other communication services to end-users according to (ITU 1999) and (ITU 1997).

Emerging Market describes an economy with low-to-middle per capita income, which has been subjected to a serious reform intending to further economic development (Sevic 2005).

Sub-Saharan Africa refers to countries situated south of the Sahara desert.

1.7 Assumptions

The following is assumed for the research:

- Respondents have a broad knowledge on the subject,
- Respondents have an openness and willingness to discuss specific strategies within their organisation and
- There is no research being done in parallel on the same theme that will produce similar results.

2 LITERATURE REVIEW

Various strategies are available to Mobile Network Operators to reach low income communities. These include innovative end-user services, new technology to enable new services to end users, innovative means to save operational expenditure (OPEX), joint ventures, partnerships with competitors, mergers and acquisitions or consolidation of network operators and managed or outsourced strategies (Henten et al. 2004; Stienstra et al. 2004; Beckman and Smith 2005; Anderson and Billou 2007; Ericsson 2007; Anderson and Kupp 2008).

2.1 Introduction

The literature review covers the sub-problems: to identify specific strategies adopted by mobile telecommunications operators in emerging economies and the second sub-problem, to justify the effectiveness of MNO strategies to reach low-income communities in a profitable and sustainable manner. A mix of established MNOs (Japan, France and Denmark) and emerging market MNOs (Phillipines, India, Latin America and Africa) are studied in the literature review.

The strategy categories considered are technology, end-user services innovation and obtaining MNO internal operating efficiencies. Conclusions are drawn and propositions are made based on the sub-problems in literature review.

2.2 Background Information

This study is based on literature obtained from academic and commercial sources. As far as possible, literature collected was based on case studies of existing MNOs. The study builds on a strong body of knowledge that exists on the topic of innovation by MNOs.

2.3 Specific Strategies taken by MNOs in Emerging Markets

This section broadly provides an overview on the first sub-problem; to identify specific strategies adopted by mobile telecommunications operators in emerging economies.

2.3.1 *Use of advanced network technology*

Technology advances have the possibility to bring about new end-user services and Capital expenditure (CAPEX) and Operational expenditure (OPEX) savings for the customer (Engvall and Hesselmark 2004) and (Kama, Marciano, Shen, Baker, Thomas, Artículo et al. 2006).

New end-user services have the potential to create new revenue streams but could also introduce more complexity into mobile networks and increased CAPEX with the initial investment for licences or network hardware and software. (Tsuboya 2003) analyses the mostly technical innovations made by NTT DoCoMo Japan, SK Telecom Korea, KDDI Japan and Vodafone. (Tsuboya 2003) suggests that technological innovation may not necessarily lead to increased revenues for MNOs. He goes on to say that technological innovation can cause the operator added network complexity, high CAPEX investment, unknown customer uptake and less predictable revenue streams.

The 4Cs framework is presented as critical success factors for measuring the possible scenarios when introducing technological innovation.

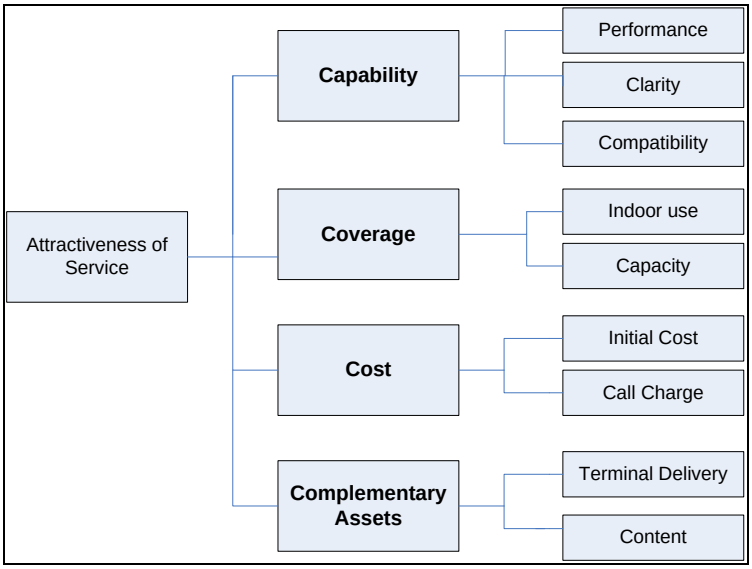


Figure 1: The 4Cs Framework (Tsuboya 2003)

Figure 1 shows that technological innovation cannot be considered in isolation, i.e. end user benefit and MNO business case should be an important driver for technology innovation.

(Henten et al. 2004) outline ongoing technology advancements in the form of new end-user services as a way of MNO innovation in Denmark. Examples of new end-user services introduced include Intelligent Network (IN) based services, Internet access, Prepaid mobile cards, National mobile roaming, GPRS, Location based services, Mobile payment, Multimedia Messaging (MMS) and Wireless Local Area Network (WLAN).

(Henten et al. 2004) goes on to outline the flattening or decline in Research and Development (R&D) spending by MNOs – the trend being for most technology innovation to be done by Mobile Infrastructure vendors and the MNOs focus on end-user services, distribution and customer retention (reduction of churn).

In order to reduce Total Cost of Ownership (TCO) of mobile networks, telecommunications vendors have developed specific network features that may be useful for MNOs in emerging markets (Engvall and Hesselmark 2004) and (Kama et al. 2006). Examples of these network features are:

- Improved coverage with the same number of base station sites or more coverage with fewer sites,
- Outdoor equipment reducing power and cooling requirements,
- Local switching of calls in the same serving area,
- Shared Networks (two or more operators sharing network infrastructure).

Shared Networks have the potential to reduce MNO OPEX and CAPEX (Beckman and Smith 2005). (Beckman and Smith 2005) use the marketing product life cycle to justify the point where Shared Networks are most effective as a tool for MNO CAPEX and OPEX minimisation. Different alternatives for network sharing include Site and passive radio access network (RAN) sharing, Shared core network and Geographical / Regional split (Beckman and Smith 2005).

In analysing MNO business and operations, it is possible to separate the end-user services that generate revenue from the day-to-day operational and technical issues encountered in running a mobile network. A possible future network scenario would be to separate the financial and operational layers in an MNO (Beckman and Smith 2005).

2.3.2 *Innovative End-user services, applications and pricing*

A mobile communication end-user application is defined as “A structured set of capabilities, which provide value-added functionality supported by one or more services” (ITU-T 2000), p2. An end-user service is defined as “A structured set of capabilities intended to support applications” (ITU-T 2000), p10. Examples of end user services and applications could be voice, data, Short Messaging Service (SMS), Multimedia Messaging Service (MMS) and banking (Donner 2008) and (Mallalieu 2007).

(Anderson and Billou 2007) present a framework called the 4As framework as a way of innovation for MNOs in emerging markets.

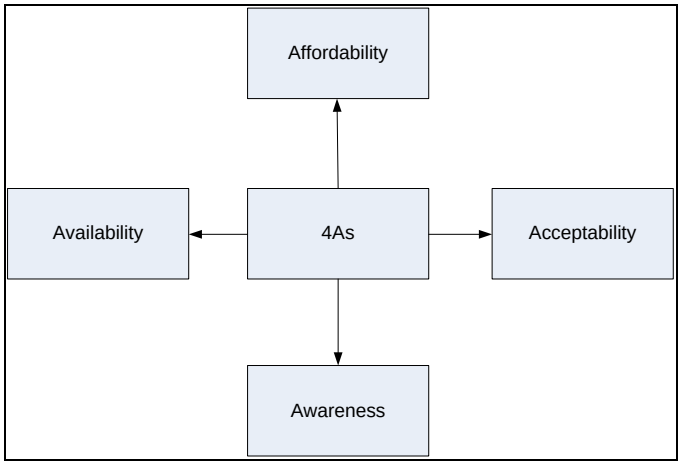


Figure 2: The 4As Framework (Anderson 2006)

The 4As framework is applied to MNOs in the Phillipines and India. Specific innovations outlined by (Anderson and Billou 2007) include lower denomination prepaid recharge cards, over-the-air prepaid top-up and improved distribution in areas where mobile communication penetration was low. (Anderson and Billou 2007) go on to say that the 4As framework can be applied when MNOs are considering the introduction of new services or innovations.

(Zibi 2006) lists Segmentation, Low Denomination Vouchers, Lifetime Subscriptions, Lower Airtime Prices, Limited Mobility Plans and Community Subscriptions as possible innovations that could increase operator revenues in emerging markets.

(Hamdouch and Samuelides 2001) present commercial and organisational innovation as two types of MNO innovations in France. The innovation trend in this research work is again driven by end-user requirements.

Mobile Telephony, m-Commerce, m-Governance, m-Health and m-Gaming are listed as pro-poor mobile applications in Latin America and the Caribbean . Mobile Telephony takes the form of individual mobile voice usage or shared access to voice as in the case of the Grameen Phone initiative in Bangladesh and various other shared or community phone applications introduced in for example South Africa, Uganda and Nigeria (Anderson and Billou 2007), (Donner 2008) and (Mallalieu 2007).

Mobile-enabled commerce (m-Commerce) provides users access to financial services using either the formal banking system, using prepaid transactions or the MNO's Short Messaging System (SMS) platform (GSMA 2006). Various m-Commerce products have been launched in for example Phillipines, South Africa and Kenya with success for the operators (GSMA 2006), (Anderson and Billou 2007), (Donner 2008) and (Mallalieu 2007). Mobile health (m-Health) applications are possible tools that can be used in the fight against HIV/AIDS (Donner 2008). A pilot m-Health project was run in Rwanda where health field-workers were able to upload data collected in the field using GPRS on the mobile network (Mallalieu 2007). The final two applications m-Governance and m-Gaming have proved to be less successful or popular in emerging markets (Mallalieu 2007).

Even though emerging market MNOs have experienced tremendous subscriber growth, literature suggests that innovative services for example financial and payment systems complement the subscriber growth and contribute to MNO revenues (Rouvinen 2006; Sridhar 2006).

2.3.3 *Innovation using handset advances and features*

Advances in mobile handset design are presented by (Koski 2007). Mobile handset design evolution has been characterised by handsets becoming smaller, battery life becoming longer, new applications being developed on handset and mobile handsets providing supplementary functions like personal digital organiser applications, alarm

clock and camera (Koski 2007). Even though the technology behind the handset is hidden from the end-user, the end-user derives the benefit of being able to run an application on the handset, e.g. SMS, MMS or email (Koski 2007).

MNOs in emerging markets list the cost of handsets as a barrier to entry when trying to reach low income mobile subscribers (Anderson and Kupp 2008). This related directly to the affordability arm shown in the 4As framework illustrated in Figure 2. The Emerging Market Handset Programme was launched by the GSM Association in 2005 is part of its initiative to “bridge the digital divide” (GSMA 2005). As part of this program, mobile handset vendors have innovated to produce low-cost mobile handsets to participating countries including India, South Africa, Nigeria, Democratic Republic of Congo (DRC), Egypt, Algeria, Tunisia, Bangladesh, Turkey, Thailand, Philippines, Malaysia, Indonesia, Pakistan, Yemen, Sri Lanka and Kenya. MNOs have the advantage of lower cost to entry when adding new subscribers onto networks (GSMA 2005).

In cases where the cost of mobile handsets are outside the affordability of end-users, shared use of handsets is the alternative to providing user access to mobile services (Anderson and Kupp 2008) and (Donner 2008).

2.3.4 *Fulfilling MNO Regulatory Requirements*

Changes in the telecommunications industry, in which MNOs operate, are affected by rapid changes in technology and regulatory policy (Fink, Mattoo and Rathindran 2003). Regulatory changes can be in the form of privatisation of state assets, introduction of competition and opening up of the markets to foreign investment (Fink et al. 2003).

Being awarded a licence to operate as an MNO usually has rollout requirements for the MNO in terms of number of lines available on the network (capacity) and towns, cities and roads that needed to be covered (coverage) (GSMA 2007) and (Donner 2008). Having met the rollout requirements, regulators have the role to regulate competition and pricing in the market (GSMA 2007) and (Donner 2008). Despite regulatory efforts to extend mobile telecommunications services to the rural areas, low income users have not benefitted from the MNO infrastructure in place (McCormick 2005).

In South Africa, the introduction of mobile telephony in 1995 has improved the tele-density (percentage of population with telecommunication access) however, mobile tariffs have increased since the introduction of competition (Gillwald 2005). This shows that the introduction of competition in the form of multiple MNOs is not enough to make telecommunications more affordable.

Deregulation of the telecommunications industry has new services like Wireless LAN and Voice over Internet Protocol (VoIP) (Chetty, Blake and McPhie 2006). The introduction of this deregulation has however not had an effect on the pricing of mobile services.

The literature around regulation points to the following:

- Regulators do not always have the capacity to enforce regulation on MNOs,
- MNOs do what they need to fulfil regulatory capacity and coverage requirements and
- Regulators are likely to become more strict in enforcing MNOs to provide affordable communication to low-income users (GSMA 2007) and (Donner 2008).

2.3.5 *Broader MNO Alliances and Organisational Developments*

Strategic developments in the telecommunications industry have seen the assemblage of Global MNO groupings – e.g. Vodafone, Orange, Millicom and MTN groups (Curwen and Whalley 2001), (Beckman and Smith 2005) and (Curwen 2008). Operator groups have leverage in terms of similar end-user offerings in different countries (operations) (GSMA 2006), (Donner 2008) and leverage in terms of bargaining power with suppliers (Porter 2008).

Network Sharing is a possible way to reduce operator CAPEX and OPEX (Beckman and Smith 2005). Site sharing is used around the world to reduce the environmental impact of mobile infrastructure and to reduce MNO operating expenditure (Beckman and Smith 2005). Assuming the regulatory environment will allow for it, separation of financial and operational aspects of MNOs is also a possible trend (Beckman and Smith 2005). This possible split is illustrated in Figure 3.

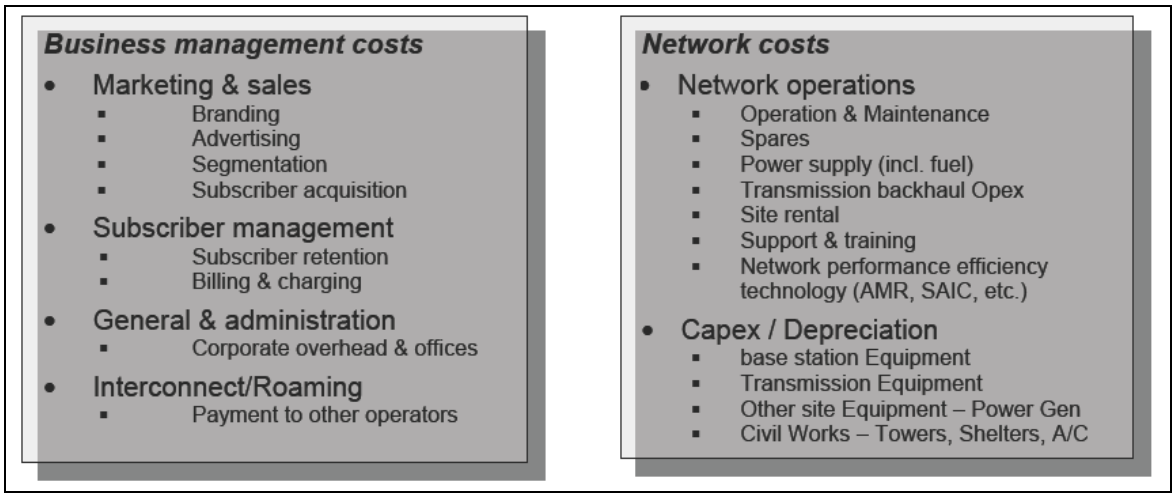


Figure 3: MNO Financial and Network Operations concerns (GSMA 2007)

Outsourced Operations or Managed Services are concepts promoted mainly by telecommunications vendors as ways of reducing MNO OPEX by having part or all of the network operations activities outsourced to a telecommunications vendor (Ericsson 2007) and (ALU 2007). Traditional MNO and vendor roles and shifting vendor and MNO roles are shown in Figure 4. The trend shows the possible overlap between traditional vendor and operator roles (Ericsson 2007).

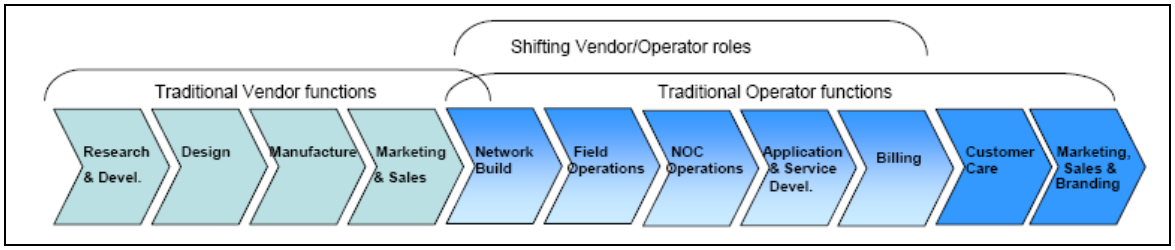


Figure 4: Mobile Vendor and Operator Value Chain (Ericsson 2007)

Specific emerging market managed services reference cases include Bharti India, Maxis Malaysia and Warid Bangladesh (Ericsson 2008).

In addition to strategic alliances, organisational restructuring and Managed Services, Mobile Value Chain analysis has become a useful tool that could be used to further research MNO organisational developments (Anderson and Williams 2004).

2.3.6 *Conclusion of the first sub-problem literature review*

In summary, possible strategies for MNOs in South Africa to reach low income communities are summarised in Table 1: MNO strategies to reach low-income communities below.

Table 1: MNO strategies to reach low-income communities

	MNO Strategy summary	**References**
1.	**Advanced Network Technologies**	
	• Enabling CAPEX and OPEX savings.	(Engvall and Hesselmark 2004) and (Kama et al. 2006)
	• Advanced technology, e.g. GPRS, WCDMA	(Tsuboya 2003), (Henten et al. 2004)
	• Shared Networks	(Beckman and Smith 2005)
2.	**Innovative End-user services and pricing**	
	• 4As framework: affordability, availability, accessibility and awareness	(Anderson and Billou 2007)
	• Segmentation, Low Denomination Vouchers, Lifetime Subscriptions, Lower Airtime Prices, Limited Mobility Plans and Community Subscriptions	(Anderson and Billou 2007), (Zibi 2006)
	• Commercial and organisational innovation	(Hamdouch and Samuelides 2001)
	• Pro-poor Mobile Telephony, m-Commerce, m-Governance, m-Health and m-Gaming	(Mallalieu 2007), (Donner 2008)

3.	**Handset advances and features** • Handset innovation and technology advances • Low-cost handsets • Shared handsets	(Koski 2007) (Anderson and Kupp 2008), (GSMA 2005) (Anderson and Kupp 2008) and (Donner 2008)
4.	**Fulfilling Regulatory requirements**	(Fink et al. 2003), (GSMA 2007), (Donner 2008), (McCormick 2005) and (Chetty et al. 2006)
5.	**Broader MNO alliances and Organisational development** • Global MNO groupings • Network Sharing • Managed Operations	(Curwen and Whalley 2001), (Beckman and Smith 2005), (Curwen 2008), (GSMA 2006), (Donner 2008) and (Porter 2008) (Beckman and Smith 2005) (Ericsson 2007) and (ALU 2007)

The literature suggests that technological innovation is not perceived as being a driver for increasing MNO revenues. Earlier trends where established MNOs in for example Japan and Europe were driven by technology innovation are being replaced by innovations driven by end-user services and MNO business cases (Tsuboya 2003), (Anderson and Billou 2007), (Donner 2008) and (Anderson and Kupp 2008). The

literature further suggests that MNOs are innovating mostly by offering attractive end-user services and pricing.

In summary, literature suggests that:

Proposition 1

Innovative end-user services are the preferred strategy used by MNOs in South Africa rather than introduction of new technology.

2.4 Appropriateness of Emerging Market MNO Strategies

In this section the appropriateness of emerging market MNO strategies is discussed. Financial, end-user, technological and competitive factors are considered when evaluating the appropriateness of MNO strategies. Possible measures of success are outlined with reference to the MNO perspective.

2.4.1 *MNO Dilemma – balancing profitability and sustainability*

Financial, regulatory and corporate social responsibility are three success factors considered for MNOs in this study.

a. *Financial Success factors*

Financial Analysts and shareholders measure MNOs success in terms of Average Revenue Per User (ARPU), Earnings Before Interest, Tax, Depreciation and Amortisation (EBITDA) and Market Share (Gerpott and Jakopin 2005), (Banka 2006) and (Zibi 2006). The introduction of new technology and services by an MNO can change the financial success factors ARPU and profitability in an unpredictable and negative manner (Katsianis, Welling, Ylönen, Varoutas, Sphicopoulos, Elnegaard et al. 2001).

In emerging markets, appropriate balancing of revenue and profitability can become tricky as MNOs need to reach more low-income users in urban and rural areas (Anderson and Kupp 2008). This MNO dilemma is illustrated in Figure 5.

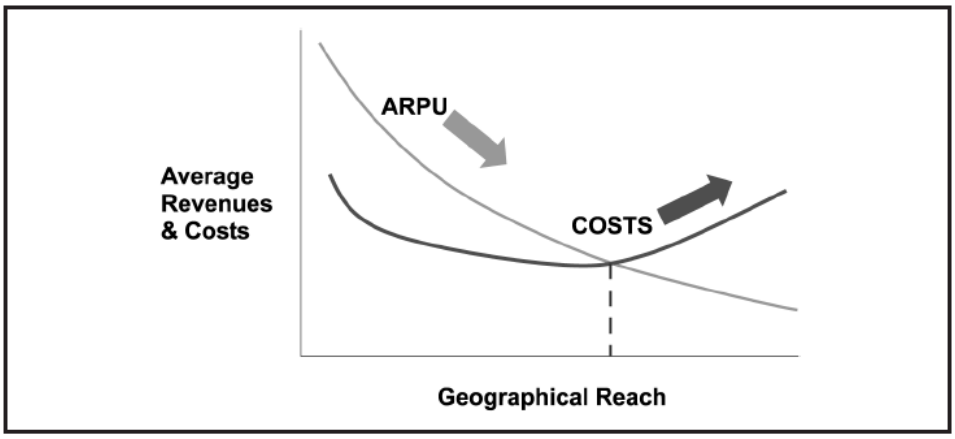


Figure 5: Balancing ARPU vs Cost for MNOs (Anderson and Kupp 2008)

To classify financial success in terms of the impact of end-user services on MNO financial performance, (Anderson and Kupp 2008) have put together a framework for appropriateness of specific end-user strategies shown in Figure 6. Ideally, and MNO would want start-up cost to be low so as to increase subscriber numbers and recurring cost to be high so as to increase revenues and profitability.

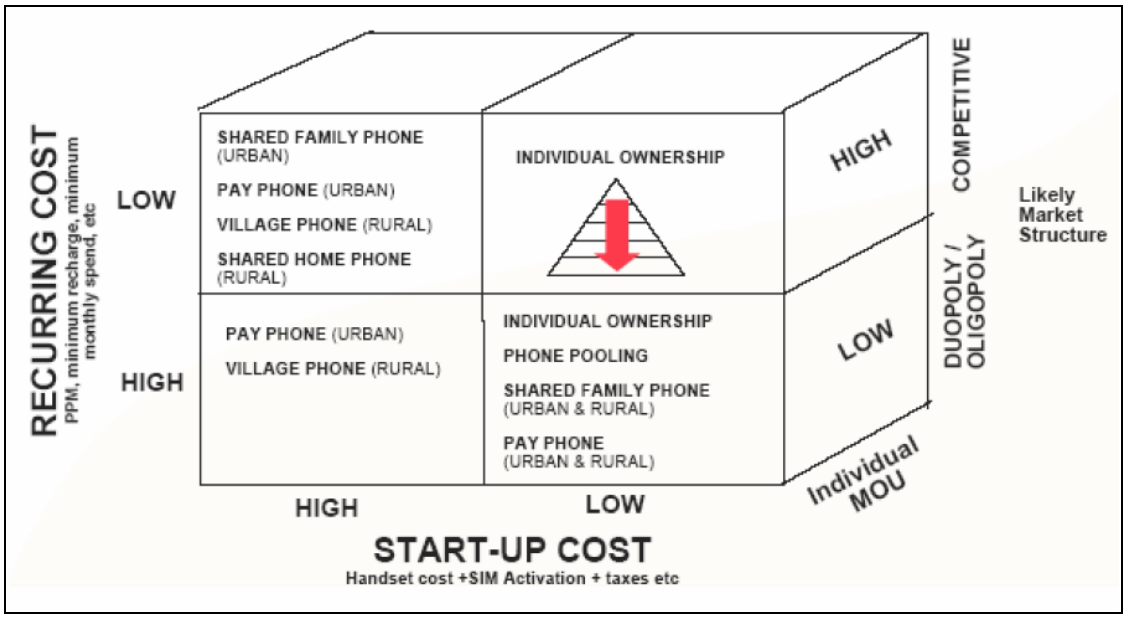


Figure 6: MNO perspective of mobile phone usage (Anderson and Kupp 2008)

An example of a market that is in the top right quadrant of Figure 6 is India where mass-market mobile telephony with low start-up costs (low price of handsets to individuals) and

low call recurring costs (low call charges). An example of a market in the bottom right quadrant of Figure 6 is South Africa where start up costs are low but call charges are high compared to similar emerging markets (Anderson and Kupp 2008).

b. *Regulatory Success Factors*

Regulatory and governmental requirements for MNOs include providing sufficient network capacity, geographical reach and suitable tariff structure for reaching existing and new mobile users (Fink et al. 2003), (GSMA 2007), (Donner 2008) and (McCormick 2005). Section 2.3.4 provides the regulatory background. Success factors in this area cannot always be measured quantitatively (Fink et al. 2003), (GSMA 2007), (Donner 2008) and (McCormick 2005).

c. *Corporate Social Responsibility*

A Corporate Social responsibility strategy for MNOs could be to provide coverage and end-user services and applications to low-income communities as a means for community upliftment (Anderson and Billou 2007), (Donner 2005) and (Mallalieu 2007).

2.4.2 *End-user success factors*

The 4As framework (affordability, accessibility, availability and awareness) shown in Figure 2 can be used as a measure for MNO success factors towards end-users (Anderson and Kupp 2008). When evaluating end-user success factors, of particular importance would be:

a. Impact of MNO strategies on individuals and communities and

b. Impact of Mobile Communication on other industries (Donner 2008), (Anderson and Kupp 2008) and (Mallalieu 2007).

The question can be asked: “Can value for the MNO be derived by improved success of other industries?” In emerging economies, the fishing and agricultural industries are two that have experienced improved success and development as a result of the introduction and expansion of MNO network coverage and capacity.

An example of impact on individuals is outlined in the quotes:

> *"mobility is clearly an important advantage for the functioning of organized political resistance in the Philippines"* (Donner 2008), p24.

> *"and for the creation of semi-private spaces for conversation"* (Donner 2008), p24.

An example of impact on an industry is outlined in the quote:

> "*for the support of Indian fishing communities"* and for the creation of semi-private spaces for conversation (Pertierra 2005) quoted by (Donner 2008), p24.

Social, economic and cultural factors of end-users can influence the success of MNOs in emerging markets (GSMA 2007), (Anderson and Kupp 2008) and (Donner 2008).

2.4.3 *Impact of Introduction of new technologies*

Prepaid charging, 3G introduction and future technologies like WIFI and VoIP will be discussed with reference to the impact of new technologies on MNOs.

a. *Prepaid – a positive impact of new technology*

The introduction of prepaid charging in emerging market MNO offerings has had an impact in terms of accessibility and affordability for end-users (Anderson and Kupp 2008), (GSMA 2006), (Mallalieu 2007) and (Zibi 2006). This introduction of new technology has had positive impact on MNO success and can be used as an example of a success factor in most emerging MNOs history (Anderson and Billou 2007; Anderson and Kupp 2008).

b. *3G – a negative or neutral impact of technology*

An example of a negative impact of technology introduction is when 3G is introduced into a market too early (Katsianis et al. 2001). Incremental improvement, e.g. introduction of GPRS and EDGE before can prove to be more profitable and sustainable in the long run (Curwen 2000). A possible strategy for an introduction of 3G with minimal negative impact would be to use shared networks as per the example of the MNOs in Sweden (Beckman and Smith 2005).

c. ***Possible impact of WIFI, WIMAX and VoIP***

WIFI, WIMAX and VoIP are three technologies that are likely to impact MNOs in the future (Chetty et al. 2006). Possible impact could be reduction of voice revenues, reduction of potential data traffic and revenues and emergence of alternative, low-cost communications providers (Zibi 2006) and (Kawashima 2002).

2.4.4 *Impact of MNO Competition*

In a perfectly competitive market, there would be a large number of suppliers (MNOs) in an unregulated market providing service at the same price (Mohr, Fourie and associates 2004). This is clearly not the case for MNOs. The history of the telecommunications industry has shown the move from a monopolistic structure to in most cases an oligopoly where few firms keep a constant eye on the actions of the others, MNOs have some control over the end-user pricing and in general the long-run economic profit can be positive (Gruber 2001; Wallsten 2001; Mohr et al. 2004; GSMA 2007; Donner 2008).

Research into emerging market mobile industries shows that competition can be a driver for innovation and lower pricing (Anderson and Kupp 2008). A competitive market showing these trends is India where the market is in the top right quadrant of Figure 6 with low barriers to entry and ongoing pricing pressure (Anderson and Kupp 2008; Porter 2008).

In the short and long run, competition impacts MNO reach (number of subscribers), revenue and profitability (GSMA 2007; Anderson and Kupp 2008; Donner 2008).

2.4.5 *Threat of substitutes*

WIFI and VoIP have emerged as potential substitutes that could negatively affect MNOs reach and future growth (Porter 2008; van Gorp and Morris 2008). In South Africa, regulation has been put in place where new entrants or existing suppliers have the possibility to apply for WIFI and VoIP licences as a means to providing cost-effective data and voice services to end-users (van Gorp and Morris 2008). It is unlikely that the regulator will allow existing MNOs access to such licences and it has been shown that

start-up costs for new entrants are high and sustainable revenue and profitability is not guaranteed (van Gorp and Morris 2008).

As technology like WIFI, WIMAX and VoIP becomes more accessible, there is a possibility that in the future VoIP will cannibalise MNO voice revenue. There is also the possibility of a re-emergence of fixed operators offering fixed-wireless type VoIP services, thereby eating into MNO voice revenue (Chetty et al. 2006; van Gorp and Morris 2008).

2.4.6 *Conclusion of the second sub-problem literature review*

In summary, literature suggests that:

Proposition 2

Appropriateness of strategies used by MNOs can be measured in terms of financial, regulatory and Corporate Social Responsibility success factors.

2.5 Conclusion of Literature Review

Various academic, online and commercial sources were used to put together the literature review. The literature included in-depth studies of the mobile communications industry in various countries, case studies on operators and industry technology and end-user innovation trends. The limitation of “emerging market” MNO trends meant that literature available on the subject was limited to availability post 2001, thereby making the body of knowledge on the subject relatively small.

The literature used for sub-problem 1, to identify specific strategies adopted by mobile telecommunications operators in emerging economies, is conclusive and little interpretation was required to reach the necessary conclusions and 1st research proposition. The second sub-problem**,** to justify the appropriateness of specific strategies adopted by mobile telecommunications operators in emerging economies to reach low income communities in a profitable and sustainable manner, was less conclusive and required some critical analysis of the literature and knowledge of the industry to reach a conclusions and the 2nd research proposition.

As far as possible, the writer tried to broaden his view of the industry and keep bias towards mobile vendors to a minimum.

In conclusion of the literature review, the research propositions are now re-stated.

2.5.1 *Proposition 1:*

Innovative end-user services are a preferred strategy used by MNOs in emerging markets rather than introduction of new technology.

2.5.2 *Proposition 2:*

Appropriateness of strategies used by MNOs can be measured in terms of financial, regulatory and Corporate Social Responsibility success factors.

3 RESEARCH METHODOLOGY

Research is the systematic process of collecting and analysing information to increase our understanding of a phenomenon under study. It is the function of the researcher to contribute to the understanding of the phenomenon and to communicate that understanding to others (Leedy and Ormrod 2005). There are three general types of research designs considered namely Quantitative, Qualitative and Mixed (Creswell 2009).

Qualitative research is a means of exploring and understanding the meaning individuals and groups assign to a problem (Creswell 2009). A characteristic of qualitative research is that the researcher is the primary data collection instrument (Merriam 2002). A qualitative research technique is used for this research as the interpretation and answers to the research problem at hand was explored by extracting meaning from interaction of people. This included interviews in the form of a questionnaire, analysis if the data and deducting and developing trends based on this data. Each sub-problem was considered separately to reach the final conclusions.

The key to understanding qualitative research lies with the idea that meaning is socially constructed by individuals in interaction with their world (Merriam 2002). The individual's world could include the organisation that the individual is associated with, for example a company or a mobile network operator. Learning how individuals experience and interact with their social world is considered an interpretive qualitative approach. Qualitative research studies are often undertaken because there is a lack of theory to adequately explain a phenomenon. In attempting to understand a phenomenon, the researcher attempts to build intuitive understanding from being in the field (Merriam 2002).

Since the researcher collected data and interpretations by individual interviews, the approach chosen was an interpretive qualitative approach.

3.1 Research methodology /paradigm

Given the type of data obtained in the literature review, a qualitative research approach was taken for both sub-problems in the research. The subjectiveness of the data and results make qualitative research most appropriate for this research (Cresswell 2003).

Two types of qualitative research were considered for this study, namely

1. A basic interpretive qualitative study and
2. Case study research.

Other types of qualitative research include phenomenology, grounded theory, ethnography and narrative analysis (Merriam 2002).

In a basic interpretive qualitative study, the researcher is interested in how individuals make meaning of a situation or phenomenon; the strategy is inductive and the outcome is descriptive. Data are collected through interviews, observations and document analysis. Data are inductively analysed to identify recurring patterns or common themes (Merriam 2002).

A case study is an intensive description and analysis of a phenomenon or social unit. The case is a bounded, integrated system and this approach seeks to describe a single phenomenon in depth (Merriam 2002). The Case Study research method can be used to further assist in deducting and developing trends obtained from a basic interpretive qualitative study. A framework for Case Study research is shown in Figure 7 (Noor 2008).

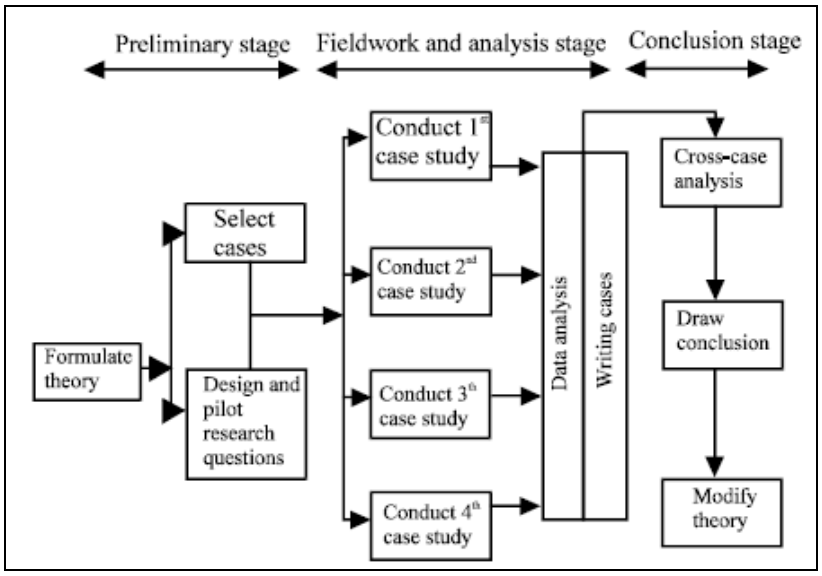


Figure 7: Case Study Research Overview (Noor 2008)

In Figure 7, it is assumed that data are collected for multiple case studies, data are analysed and summarised, cross-case analysis is performed and conclusions are drawn. Even though the case study research method described in (Yin 1994) and (Noor 2008) is a thorough research method that will bring in as much data on a topic as may be possible a Basic Interpretive Qualitative study is deemed to be more appropriate due to the broadness, openness and subjectivity of the research.

3.2 Research Design

A Basic Interpretive Qualitative Study is the Research Methodology used in this research. Data was collected by interviews and desktop research using the snowballing technique.

(Rowley 2002) defines research design as the “logic that links data to be collected and conclusions to be drawn to the initial questions of the study”. In-depth interviews using a specific set of questions were used as the primary data collection tool for this research. Interviewees had a depth of historical knowledge of the industry and company being researched. The purpose of the interviews was to examine the important criteria and alternatives that could lead to strategic decisions.

In the in-depth interview, the respondents were probed on topics in a relaxed environment to maximise discussion and data collection depth. The research question was sufficiently focussed on so that the homogenous group interviewed had shared experiences on the topic (Crabtree and Miller 1999).

In-depth interviews were conducted with executives, managers, technical, operations and marketing staff working for Mobile Network Operators. The purpose of the interviews was to obtain insights into the strategy followed by Mobile Network Operators in South Africa to reach low-income communities. Emphasis was placed on interviewing MNO staff with sufficient seniority to be able to respond to all questions in the proposed questionnaire.

The researcher used the snowballing technique when conducting the research. In the snowballing technique, the researcher attempted to access “hidden populations” by referrals from interviewees or informants (Noy 2008). The advantage of this technique is that it allowed the researcher to source additional data not available for initially identified interviewees. The disadvantage of this technique are the ethical considerations around sourcing confidential information used by the organisation to arrive at strategic decisions (Perry 1998).

The researcher used multiple in-depth interviews and findings were corroborated and compared using triangulation. The final result of triangulation were data sources convergence and consistent conclusions (Leedy and Ormrod 2009).

3.3 Population and sample

Two Mobile Network Operators (MNOs) from sub-Saharan Africa were included in this research. The data was collected through structured interviews with MNO management, technical and marketing staff.

A questionnaire was designed based on the main findings in the literature review and the outcome of the interviews compared the interview findings with the literature review research propositions (Appendix A).

Selecting in-depth interview participants was based on an iterative process referred to as purposeful sampling that seeks to maximise the depth and richness of the data to address the research question (DiCicco Bloom and Crabtree 2006). Contact was made with the MNOs through Key Account Managers within the mobile vendor organisation working towards the specific MNOs. Due to the strategic nature of the research, the sample chosen was not a random sample but rather a purposeful, convenience sample (Merriam 2002; Leedy and Ormrod 2009).

Table 2 shows a list of respondents to the interview questionnaires to formulate research data for MNO 1 and MNO 2.

Table 2: List of respondents

Position of individual	**Company**
Executive Head: Service Delivery and Operations	MNO 1
Portfolio Manager: Emerging Markets	MNO 1
Executive Head: Regulatory Affairs	MNO 1
Technology Manager: Network Engineering	MNO 1
Chief Technical Officer	MNO 2
General Manager: Regulatory Affairs	MNO 2
General Manager: Strategy, Innovation and Marketing Support	MNO 2

The snowballing technique was used to identify further interviewees that may be able to further contribute to the research (Noy 2008). Further potential interview questionnaire respondents were identified but the researcher found effective analysis and conclusion using the research results from the respondents listed in Table 2.

When using the case study research technique, a minimum of 2 to 4 cases and a maximum of 10 to 12 cases is deemed to be ideal in order or findings to be credible (Yin 1994; Perry 1998; Noor 2008). A minimum of 3 individuals per MNO was considered as a large enough sample for this research. It is important that both identified MNOs would be

sufficiently represented, hence 3 interviewees was the minimum number of interviewees per MNO.

3.4 Procedure for data collection

In order to perform in-depth interviews effectively, it is essential to have a structured approach to obtain specific answers in an attempt to formulate the key insights to Mobile Network Operator strategy to reach low-income communities (Perry 1998).

Data was collected in an in-depth interview from potential interviewees listed in Table 2 using a proposed structured questionnaire shown in Appendix A. Interviews were one-on-one, recorded and did not last longer than one hour. Interviews were scheduled by email and confirmed telephonically.

The eight questions in the questionnaire have been formulated based on the Literature Review with the basic research question being the first as recommended by (DiCicco Bloom and Crabtree 2006). A pilot interview was conducted with an expert outside of the proposed sample in Table 2 in order to refine the interview questionnaire. The in-depth interviews were personal and intimate in order to collect detailed narratives and text rather than quantitative-style data (DiCicco Bloom and Crabtree 2006).

Data was collected during a 6 month period as outlined in the research time plan.

To complete the data required for the case study, additional data was sourced from Telecommunications industry knowledge, MNO annual reports, literature available on the MNO and online databases from relevant organisations for example GSM Association, ITU, Economist and World Bank.

3.5 Data analysis and interpretation

Data interpretation followed the approach of analysing case studies. Theory can be built from cases studies using the process described in (Eisenhardt 1989). If simple convergence is not evident (Merriam 2002), cross-pattern search techniques were used for deeper analysis of the data (Eisenhardt 1989; Perry 1998).

Apart of financial data available, data collected was mostly of a subjective nature and conclusions were drawn or convergence achieved based on the data collected using triangulation (Merriam 2002; Creswell 2009; Leedy and Ormrod 2009).

3.6 Validity and reliability

In order for research to be credible, it is important that data collected is validated and reliable. The human instrument has shortcomings and biases that might impact the study. These biases are identified and monitored so that data collection and interpretation are not shaped by these biases (Merriam 2002).

An approach for deriving conclusions and theory from case study data is outlined in (Eisenhardt 1989). Validity in qualitative research refers to whether the research is credible, including the source and the truthfulness of the data collected (Burke Johnson 1997; Barbour 2001; Bell 2005) and (Golafshani 2003).

Triangulation is the method of validation used for this research (Merriam 2002; Cresswell 2003; Leedy and Ormrod 2009).

3.6.1 *External validity*

Respondent validation involves cross checking interim research findings with respondents (Barbour 2001). In checking external validity in this proposed research, the views of persons working in other MNOs were used by the author to check validity of the data collected in the research. Informal access was gained to MNO staff in MNOs other than those involved in the case study to validate the ideas generated by the case studies. Additionally, data collected was validated against the literature review and new literature on MNO strategies to reach low-income communities was evaluated on an ongoing basis during the period of research.

To further validate the research findings, comparisons were made with other industries in emerging economies where “serving the poor” were used as a comparative measure (Prahalad 2006; Anderson and Kupp 2008).

3.6.2 *Internal validity*

In checking internal validity, research sub-problems, propositions and findings were shared with researchers and persons working in the mobile communications industry. Additionally, the author validated research sub-problems, propositions and findings with colleagues working in the mobile vendor where he is employed.

Data obtained from in-depth interviews were cross-referenced as best as possible using triangulation (Perry 1998).

3.6.3 *Reliability*

Reliability is the extent to which a test or procedure produces similar results under constant conditions on all occasions (Bell 2005), p117. To test the reliability of the data, triangulation was used (Barbour 2001). This was done in a similar manner to the test for validity. Data collected and initial findings were discussed with the supervisor and other researchers in the field to test the reliability. To further test the reliability of data collected, additional interviews can be run with respondents at a later time after the initial interview to check that data collected previously is current (Bell 2005).

3.7 Literature Review mapping to Research Questionaire

In an attempt to align the Research Questionnaire with the Literature review, Figure 8 shows how mind mapping was used to show the link between the the Literature Review and Research Questionnaire (Buzan 1996).

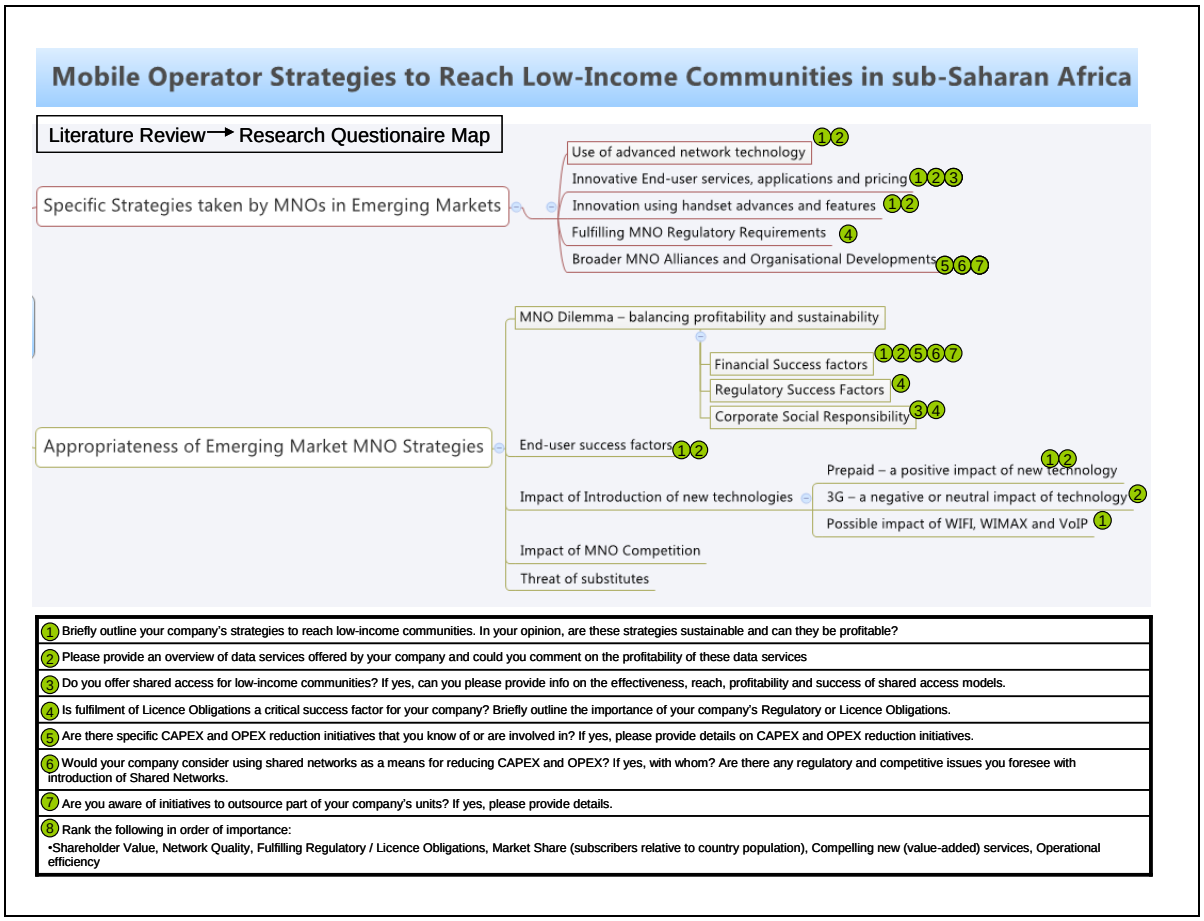


Figure 8: Literature Review to Research Interview Questionaire mapping

4 PRESENTATION OF RESULTS

The reason for elaborating and detailing the findings of each of the interviews is to highlight the interviewee's understanding of the Mobile Operator's Strategy to reach low-income communities.

Specific MNO strategies outlined in section 2.3 are presented based on interview findings and their effectiveness to the MNO is further discussed.

4.1 Vodacom Overview

Vodacom South Africa was founded in 1993 as the Mobile Network arm of Telkom South Africa. Vodacom launched networks in Lesotho in 1996, Tanzania in 2000, Democratic Republic of Congo in 2002 and Mozambique in 2003. Vodacom has been innovative in the South African market, being the first to launch Prepaid charging in 1996, GPRS and MMS in 2002 and 3G in 2004 (Vodacom 2009).

In 2011 and 2012, Vodacom focused on **Network Quality**, **Mobile Internet**, **Regulatory changes**, Subscriber **Churn Management** and **Cost Efficiency** as the five most strategic issues (Vodacom 2012).

4.2 MTN Overview

MTN, incorporated in 1994, has MNO licences in 21 countries, spanning 3 continents, headquartered in Johannesburg. MTN's strategy pillars are shareholder value, customer experience, innovation, sustainable growth and a transformed operational model (MTN 2012).

4.3 Specific Strategies taken by MNOs in South Africa

This section will broadly provide an overview on the first sub-problem; to identify specific strategies adopted by mobile telecommunications operators in South Africa.

4.3.1 *Use of advanced network technology*

MTN believes the first way to reach the population would be to build as much network coverage as possible. Technology advances like transmit coherent combining, remote radio units, mast-head amplifiers, extended range and half-rate have meant that operators can build more coverage in deep-rural areas with fewer sites (Bjarhov 2004).

Operators make use of Geographic Information System (GIS) data bases to understand population distribution to build out network coverage and capacity more efficiently.

Vodacom tries to steer traffic in the network so that voice services are offered primarily on the 2G network and data services on the 3G network. The operator strategy is to increase the penetration on 3G handsets to grow the data market and to more use the network more efficiently.

4.3.2 *Innovative End-user services, applications and pricing*

Voice has traditionally been the most important end-user service for MNOs in South Africa. Voice revenues are flat or slightly declining due to price wars and regulatory interventions. MNOs cannot differentiate themselves on voice alone as voice is becoming a commodity. Value is found in the strategy towards the consumer but new end-user services offered need to be profitable and sustainable. Data offerings have become more important strategically for MNOs in South Africa.

End-user services need to be relevant to the needs of the segments being served, need to serve the end-user and promote the MNO's brand. End-users need to be seen to be rewarded for the services used. MNOs need to know the customer and offer relevant services.

More calls on the network introduces elasticity, more minutes of use, increased usage of network resources produces better MNO return on investment (ROI).

a. ***Distribution***

MTN achieves greater population reach by improved distribution of devices, SIM cards and airtime. This sometimes means using retailers as distributors and making prepaid

airtime available in lower denominations and allowing multiple means of purchase – operator shops, local distributors, retailers, ATMs and online purchases. The lower voucher denomination model was first rolled out in India and is successfully implemented in Africa. (Prahalad 2006) is a widely used reference by MNOs who have seen success in using smaller denomination prepaid vouchers.

b. *Mobile Advertising*

Mobile Advertising is mentioned by MNOs as an innovative end-user service. Mobile advertising could be in the form of Mobile Messaging, Mobile Data Content and Mobile Commerce (Vodacom 2009). An example of Mobile Advertising using Mobile Messaging is the “Please call me” service that has a reach of the complete operator’s mobile subscriber base including low-income communities. Vodacom South Africa estimates that 35million “Please call me” messages are sent per month and that it makes around R60 million revenue as a result of the “please call me” service.

Vodacom uses it’s “Vodafone live!” portal for mobile data content advertising. Another mobile advertising revenue stream is through welcome ringtones. Targeted advertising is possible by the operator understanding the end-user profile and interests. Mobile advertising proves to be not only an innovative service to reach low-income communities but is also a profitable revenue stream for Vodacom.

c. *Profitable Mobile Data Services*

Data has become more important strategically for Vodacom.

- Initially basic internet access using dongles or fixed-wireless home devices.

- More recently, smartphones are becoming the preferred method for end-users to access the internet.

In June 2011, Vodacom SA had 3 million smartphones in the network. Affordability is still a barrier to entry, confirming the 4As framework (Anderson and Kupp 2008). Vodacom and MTN have partnered with handset manufacturers to develop and launch low-cost smartphones.

Since the launch of Mobile Data services in around 2002, operators have become innovative in how mobile data services can be launched to more users and how these data offerings can be profitable. Mobile Data services need to be compelling to end-users. An example of a compelling Mobile Data service is Facebook. Vodacom South Africa estimates that it generates more than R50 million rand per month on data revenue related to Facebook usage.

Mobile Internet is seen as an enabler for delivering new end-user services like financial services, health, recruitment and job-search.

- Vodacom and MTN have seen sustained growth in data over the past 3-4 years.

- Usage of data services is mostly first thing in the morning and last thing at night.

- End-users consider privacy, convenience and immediacy of service as important factors for using the internet on the mobile phone.

- There is a shift from PC-based internet access to internet access on the mobile device or smartphone.

Web-box is a low-cost product that provides internet access using a television screen. The target end users are households that do not have PCs or laptops but have a requirement for fixed-type internet access. Vodacom had 10k Web-box subscribers one month after launch. This end-user service has been rolled out in Vodafone OPCOs in India, Ghana and Kenya.

Low-cost smartphones and other low-cost internet devices will be the preferred way of using the internet for new data users.

Further to the affordability of data, MNOs offer prepaid data bundles of certain data volumes a day for a fixed fee at a rate cheaper than post-paid data that is charged per megabyte.

Profit from data may not be see immediately and may require value-added services for additional profit generation.

d. *Mobile Entertainment Services*

Vodacom offers Mobile Entertainment services to more than 2 million users through the Vodafone Live portal. Examples of services offered include music, video, picture downloads, ringtones and online video. Mobile entertainment services have proven to be innovative and compelling for the youth population.

e. *Shared access service*

The community services telephone concept outlined in 4.3.4a is innovative in that it attracts more usage on the network from shared access phones. Initially the service was successful as it offered end-users voice calls at lower voice tariffs. As Vodacom began to offer lower-cost handsets and lower denomination prepaid vouchers, the individual affordability of mobile phones meant that more users could access personal mobile phones and there is now declining usage and revenue from community services telephones.

Vodafone did offer internet café type services in a container but the concept did not prove successful. Handset-based data services like social media attracted the youth segment to use handsets instead of personal computer (PC) based data applications. With the cost of mobile data becoming more affordable, end-users can afford to use internet services mobile phones.

Shared access services for voice are only applicable for deep rural communities. There are privacy concerns around shared access. Web-box internet service is a type is shared access but the service is new and uptake is uncertain.

f. *Mobile Money / Mobile Commerce*

There are trends of banking and other money services being offered by mobile operators. Initially in South Africa, the service was offered by banks on mobile operator networks. The mobile banking service had the potential to be successful in South Africa due to the well regulated and well-established banks. In Kenya, the banking regulator allowed mobile operator Safaricom successfully offered mobile money services without the backing of a bank, driven by Safaricom’s strong local brand and the government

drive for financial inclusion (Panchasara 2011). The Safaricom M-Pesa model is the one likely to be followed in countries with a less-regulated financial services sector.

Mobile money or M-Commerce services have the potential to provide operators:

1. New revenue streams as was seen when prepaid voice was introduced and
2. A strategy for customer retention.

g. *Mobile Health (mHealth)*

Vodacom has partnered with Geomed in 2011 to focus on the deployment of mHealth, in particular the development of mobile-based data collection and decision support systems (Geomed 2011).

h. *Other Value-added services (VAS)*

Value-added (VAS) or non-voice services are high priority for Vodacom. At the time of the data collection, Vodacom had four executives with Value-Added services portfolios.

Literacy can be a barrier to the large-scale adoption of non-voice services but Vodacom has successfully been able to assist challenged end-users to increase the uptake of non-voice services.

VAS needs to be seen to improve the end-user's quality of life. For example, rural communities benefit from agricultural information; job search provides improved prospects for job seekers and other online services can help with skills development. In addition to improving quality of life, end-user experience helps improve the MNO's brand

4.3.3 *Innovation using handset advances and features*

Based on responses to interview questions, sections 4.3.1 and 4.3.2 adequately cover the use of handset advances and features and no further discussion is required on this topic.

4.3.4 *Fulfilling MNO Regulatory Requirements*

As part of this study, heads of government relations and regulatory affairs for Vodacom and MTN were interviewed. In addition to this, regulatory insights were gained from all the MNO interviewees.

a. *Licence obligations*

From a licencing point of view, it is imperative that MNOs comply with licence obligations. Failure to comply with licence obligations could mean penalties for the MNO or the MNO could potentially lose the licence.

Initially, the MNO licence condition in South Africa was to cover the entire country. This was later relaxed to a percentage of the country within a certain number of years. This included percentage coverage requirements for population and geographic coverage. In Tanzania, there are no geographic coverage licence obligations and this influences the MNOs reach into low-income communities. Coverage obligations compelled MNOs to make end-users use the service to recoup costs.

As part of MNO's licence conditions in South Africa, operators need to comply with Universal Service Obligations that include the rollout of Community Services Telephones (CSTs) and rollout of internet connectivity to clinics and schools (USAO 2012).

In addition to rollout and universal service, MNOs in South Africa also have quality of service obligations whereby the network quality needs to be maintained according to a set of Key Performance Indicators (KPIs) set out by the regulators. These KPIs include call setup success rate and dropped call rates.

b. *Community services*

The Community Services Telephone (CST) Operator concept provides public telephone voice services to previously disadvantaged communities such as townships and rural areas. The primary objective is to ensure that these areas have access to affordable mobile telecommunications. In the Community Services telephone concept, the interconnect charge (charge incurred by the MNO to call onto another MNO's network) is less than the mobile interconnect charge.

MNOs in South Africa had an obligation to roll out 2000 CSTs. This target was reached within 3 years. Initially, Vodacom rolled out 22000, MTN 18000 and Cell-C 50000. CSTs proved profitable for MNOs because the termination rate is 6c compared to the R1.40 for normal mobile calls to other operators. As CSTs became profitable for MNOs, Vodacom proceeded to roll-out more than 100000 CSTs in containers which proved to be uplifting for communities.

c. *Internet connectivity to schools and clinics*

The MNO 3G licence obligations include the rollout of internet connectivity to 5000 government schools or further education training centres. MNOs found that there was not good co-ordination between the regulator and operators for fulfilling these licence obligations. Vodacom connected between 800 and 900 schools, supplied a router and donated a computer from the Vodacom Foundation. There however proved to be security issues and schools in some cases could not afford the monthly cost of connectivity.

MTN foundation is involved in internet lab provision to schools. In addition to providing the internet connectivity, MTN Foundation provides power, computers and end-user training. The Department of Communications has since adopted a similar model and is providing government-funded computer laboratories in the same way as MTN Foundation initially launched.

d. *Provision of connectivity to low-income communities*

When MNOs were awarded 1800MHz spectrum in 2004/5, MNOs had an obligation to provide 2.5 million SIM cards and 125000 terminals to low income or impoverished communities. The regulation was however not clear on the definition of impoverished communities resulting in this obligation not being fully met.

e. *Contribution to Universal Services Fund*

Every entity that holds a mobile operator licence in South Africa contributes 0.1% of turnover to the Universal Service Fund (USF). More than 1 billion rand has been accumulated in the USF. The Universal Service Fund is used to fund rollout to underserviced areas in South Africa through the Universal Service and Access Agency of South Africa (USAASA). Plans are in place for improving management of the USF.

Under-serviced Area Licences (USALs) were developed to meet the communication needs of these underserved communities (Thlabela 2007). MNOs in South Africa provide Underserviced Area Licensees (USALs) access to its network. Under the USAL agreement, the MNO provides preferential rates to the USAL licensees in order for the USALs to provide service in underserviced areas. It is in the MNO's best interest to use the network coverage to generate more revenue. USAL access is one way of doing this. Even though providing USALs access to the network is a regulatory requirement the drive for the MNO to extend the network to grow the revenue base.

f. *Network Sharing*

ICASA encourages MNOs to share network infrastructure like sites and towers. Operators have used site and tower sharing to reduce the cost to reach low-income communities.

In addition to site sharing, roaming agreements exist allowing operators to use other operators networks to provide end-user services. An example of a roaming agreement is Cell-C that roams on Vodacom's network when it does not have coverage in a specific area.

One MNO interviewed mentioned an interest to share radio networks using Long Term Evolution (LTE), a 4th generation (4G) mobile standard, in the 800MHz band. This wholesale shared network trend is being promoted by regulators in sub-Saharan Africa and can reduce the network rollout cost for MNOs. Various models for wholesale network sharing are outlined in (Jakobsson 2012). Tied into the subject of wholesale network sharing are national broadband plans an example being the Australian National Broadband Network whereby the Australian Government set up a parastatal company to provide broadband access to citizens (Gerrand 2010).

g. *Tariffing regulation*

The regulator, ICASA, regulates mobile termination rates for voice calls. The voice termination in South Africa decreased from R1.40 to 73c per minute during 2011 and will continue to decrease. Retail rates are not regulated by the regulator but the regulator

may start regulating retail rates if operators do not pass the decrease in mobile termination rates on to the consumer.

Making data affordable is a regulatory requirement however there is nothing like a data termination rate to guide operators what end-users should pay for data.

h. ***Regulation of Interception of Communication (RICA)***

The Regulation of Interception of Communication (RICA) Act of 2002 makes provision for protection of subscriber information by MNOs and interception of voice and data calls (RICA 2002). RICA also involved registration of SIM cards. RICA has successfully been implemented by Vodacom and MTN SA.

i. ***Local MNO ownership***

In order to fulfil the spectrum licence obligations, MNOs needs 30% BEE compliance. MTN has achieved this already, Vodacom not yet.

4.3.5 *Broader MNO Alliances and Organisational Developments*

a. ***Market Positioning***

MTN mentioned that scale is required to have operational efficiency to increase MNO profitability. MTN aims to be either number one or two in markets where it operates. The mobile communication industry is starting to see consolidation where smaller operators are being acquired to get better industry efficiency, indicating the MNO belief that scale is needed to ensure efficient operation. MNOs need to carry traffic at a low cost and having 4-5 MNOs in a single market is not sustainable.

Scale is needed in particular with the increase data traffic with increased data speeds becoming available. Data speeds and data demand have increased to an extent that MNOs are offering fixed broadband access where this is needed.

b. ***WASPS***

A Wireless Application Service Provider (WASP) is a third party service provider who creates and distributes mobile content to subscribers via an MNO's network and

infrastructure. WASPs can generate revenue by providing premium rated content that the end-user is willing to pay for. The end-user is billed by the MNO for the mobile service, and a portion of the revenue is paid out to the WASP.

c. *Vodacom South Africa Organisation developments*

Vodacom since its inception has been an engineering-driven company. One of the interviewees mentioned that the company could have been even more successful if business success was more of a focus earlier on. As a result of the engineering focus, Vodacom has a large and operationally inefficient organisation with single roles being fulfilled by multiple individual or departments. The interviewees saw the need for a review of the organisation structure in an attempt to make it more efficient. The option of outsourcing certain business functions would also add efficiencies to the organisation.

d. *Managed Services / Outsourcing*

To reduce risk and focus on its core business, Vodacom Group has outsourced network operations in Tanzania and Mozambique. In South Africa, the network is seen as a competitive advantage and no steps have yet been taken to outsource network operations.

In Vodacom South Africa, customer care is outsourced. This is a decision based on creating operational expenditure efficiency and is a best-practice strategy employed by Vodafone group. Before customer care was outsourced, it was seen as a core business for Vodacom. The interviewees questioned whether outsourcing customer care was the correct strategy for Vodacom as customers / end-users satisfaction directly influence the financial success of the operator.

As a vision for the Vodacom Group, the interviewees mention that Vodacom should focus on end-users and business success factors.

MTN are always investigating ways to outsource parts of the company's units. Build and operation of MTN's self-provisioned transmission network was outsourced from day one, where MTN built limited competence in transmission and relied on vendors for the design, build and maintenance of this part of the network. MTN is also looking to extend agreements with Dark Fibre Africa and CitiConnect for transmission network leasing.

e. ***Tower companies***

Tower companies have emerged since 2008 to offer MNOs the option to sell passive infrastructure, enabling an offload of assets and allowing for more efficient use of sites and towers. An example of a tower company transaction was Cell-C that sold its towers to American Tower Company.

f. ***Mergers and Acquisitions***

Even though Vodacom forms part of the Vodafone Group, the second biggest operator group globally, Vodacom has limited presence in Africa compared to MTN. Vodacom have plans to enter new markets in sub-Saharan Africa through the acquisition of shareholding in existing operators in sub-Saharan Africa. Even though mobile subscription penetration levels in sub-Saharan Africa are low compared to large markets, there is a potential of increasing subscription levels and operator revenue when reaching more of the underserved population.

Vodacom Ventures is a company set up by Vodacom to generate innovative products and services for the Vodacom Group either through in-house innovation or acquisition of companies with innovative ideas. Vodacom ventures have been involved in innovation around value-added services including Mobile Media, Advertising, financial services, health and mobile money.

g. ***Value-added Services partnerships***

With the move away from voice as a primary source of revenue for mobile operators, value-added or innovative end-user services listed in section 4.3.2 have become important for operator revenues. In some cases, the MNO is able to offer these services directly to end-users, using the MNO brand. In other cases, the MNO will partner with the Value-added services provider. An example of this type or partnership is Vodacom's M-PESA partnership with Nedbank in South Africa (Vodacom 2011).

The MNO strategy here would be to compete in the area where the MNO needs to complete and complement its end-user offering with other products, for example retail and financial services.

h. *Vendor / supplier partnerships*

MNOs are dependent on vendors for supply of network, billing and value-added services platforms and services. In some cases, the design, delivery, operation and maintenance of platforms can be 100% outsourced. An example of this is BCX that has been responsible for development on Vodacom's Prepaid platform.

In some cases, MNOs see other vendor-procured items like Network Equipment, handsets, marketing and IT services as commodity products that can be centrally procured (Vodafone 2008), (MTN 2013). This central procurement reduces CAPEX and OPEX costs for the MNO groups.

i. *The Emergence of Global Operator Groups*

Both Vodacom South Africa and MTN South Africa form part of Global Operator Groups and neither are the biggest country operating company in the Global Operator Groups.

The Vodafone Group is truly global with a significant presence in Europe, the Middle East, Africa, Asia Pacific and the United States (Vodafone 2013). In the case on Vodacom South Africa, more benefits from being part of a Global operator group when Vodacom changed from being a partner to being a subsidiary in 2008 (Vodacom 2009).

Benefits for Vodacom being part of the Vodafone Group include:

- Supply chain benefits – central procurement by local opco's leads to optimised global procurement savings.

- Access to the Vodafone intranet provides employees the option to move internationally within the Vodafone group.

- Access to innovative end-user services for launch in local markets. For example, M-Pesa first launched successfully in Kenya has now been launched in Tanzania, Afghanistan and India. If an end-user service is successfully launched in one market, it is likely to be launched in a similar way in another market; for example Safaricom M-Pesa and Vodacom Media that would be later launched in other markets.

- Vodafone has global customers, for example Coca-Cola and BMW, that became stronger corporate / business customers when Vodacom became a full Vodafone opco / partner.

- Media exposure, for example Vodafone enjoys a global relationship with Unilever in the media space that would not have been successful in South Africa had Vodacom not been part of the Vodafone group.

- Local branding remains; Vodacom retains the original name in keeping with the agreement with the South African government but has access to every benefit a Vodafone-branded opco has.

- Vodafone has a culture of delivery and performance.

- Vodafone has standardised job-roles / positions with salaries normalised across OPCOs.

- Job rotation allowing Vodafone staff to be placed in other Vodafone companies globally.

- Vodafone encourages and rewards innovation and entrepreneurship within the organisation provided the business plan meets group requirements.

Specific benefits of being part of a global group, highlighted on the Vodafone website (Vodafone 2013) include:

- Harmonisation of the group,

- Brand value,

- Emerging Market strategies and

- Mobile media.

4.3.6 *Discussion on Sub-Problem 1*

Research findings suggest that innovative end-user services are important to MNOs to attract and retain customers. By offering innovative and compelling end-user services, MNOs are able to generate better revenues.

Regulatory requirements and corporate social responsibility of less of an impact on MNO's strategies compared to financial success factors.

Operator CAPEX and OPEX spend is less of a lever for MNO success compared to revenue-generating success factors.

Advanced technology is seen as an enabler for innovative, revenue-generating end-user offerings.

4.4 Appropriateness of South African MNO Strategies

4.4.1 *MNO Dilemma – balancing profitability and sustainability*

a. *Financial Success factors*

Mobile advertising proves to be not only an innovative service to reach low-income communities but is also a profitable revenue stream for Vodacom. Vodacom South Africa estimates that it generates more than R50 million rand per month on data revenue related to Facebook usage, making Facebook an innovative and financially successful service.

Research findings show that mobile operator **data Services are profitable**, with Vodacom South Africa recording more that R4 billion data revenue in 2011. Vodacom have a 15 year vision to offer voice as a free service.

Operators like Vodacom are under EBITDA pressure but there are proving to be alternative revenue streams to voice communications.

Vodacom have increased CAPEX investment in Fibre infrastructure in order to reduce OPEX incurred by leasing transmission capacity from Telkom. With the increase in data traffic, Vodacom has continued CAPEX investments.

Vodacom Network OPEX reduction initiatives include:

- Network modernisation to reduce energy costs,
- Reducing energy consumption in all buildings,
- Moving out of leased buildings and reducing the number of switching sites and
- Site sharing.

MTN suggested the following innovative ways to reduce network CAPEX and OPEX:

- Infrastructure sharing,
- Off-balance sheet or Leased solutions implemented in rural Nigeria,
- Reducing operator risk by having the vendor build and maintain the network (the Bharti Airtel model).

MTN's OPEX budgets have remained flat year-on-year or have been decreasing. The OPEX budget trend in MTN's case is that the OPEX has not increased over the past 5 years.

MTN's CAPEX spend has been focused on increasing data penetration within the MTN subscriber base. In 2012, MTN had reached 60% of the population with data coverage. Additional MTN CAPEX approval is subject to a strict business case based on increasing revenue, customer service or network quality.

b. *Regulatory Success Factors*

MNO regulatory requirements are high on the agenda on MNOs for the purpose of retaining MNO licences and motivating for more spectrum. MNOs commented that the regulations are sometimes unclear and not 100% enforced, making regulatory success factors less important than financial success factors.

c. ***Corporate Social Responsibility***

Corporate Social Responsibility was not rated as highly important as financial and regulatory success factors.

4.4.2 *End-user success factors*

Facebook and other social media applications are services on the mobile data network that help attract and retain users.

Compelling Value-added services can help attract and retain customers and in so doing help MNOs increase the financial success factors.

Superior Network quality enables better user experience, happier customers and more voice and data revenues for MNOs, thereby increasing the financial success factors.

Respondents indicated that end-user success factors drive financial success for MNOs.

4.4.3 *Impact of Introduction of new technologies*

a. ***Prepaid – a positive impact of new technology***

Prepaid voice made mobile communication affordable and accessible to end users. Further innovation like lower-denomination vouchers, improved distribution and dynamic tariffing further increased the success of prepaid voice in South Africa.

b. ***3G – a negative or neutral impact of technology***

3G was introduced as a mobile data and voice service. The success of 3G only became apparent with the introduction of smart phones and compelling end-user services like social media. Mobile Data is a growing revenue stream for MNOs and proves not to have a negative impact on MNOs yet.

c. ***Possible impact of WIFI, WIMAX and VoIP***

WIFI is not a threat to MNO revenue streams. MNOs are in fact using WIFI to offload mobile broadband traffic in high-traffic areas.

WIMAX is a niche local-market technology that did not have the same uptake as mobile broadband based on 3G.

The emergence of over-the-top VoIP services like Skype and Viber may yet prove to have a negative on voice revenues.

4.4.4 *Impact of MNO Competition*

In South Africa, the number one and two operators have enjoyed healthy competition and have been highly successful, maintaining good voice and data revenue and delivering good network quality for end-users. The third and fourth licensees proved to be less successful than Vodacom and MTN, both being late entrants and together having less than 10% market share.

4.4.5 *Threat of substitutes*

Substitutes are not seen as a threat to the two MNOs studied.

4.4.6 *Discussion on the second sub-problem literature review*

In summary, research findings suggest that financial success factors far out-weigh regulatory and Corporate Social Responsibility success factors.

Regulatory success factors are seen as necessary for continued operation but not as critical for creating MNO Shareholder value.

4.5 Summary of Interview Research Findings

Table 3 provides a summary of research interview findings per respondent, indicating where literature review findings have been confirmed in the data collection and analysis.

Table 3: Summary of interview findings

			Literature review	Executive Head Products and Services	Product Manager Data	Regulatory Affairs	Technology Manager	Chief Technology Officer	Regulatory	Strategy and Marketing Support
Specific strategies taken by MNOs in South Africa	Use of advanced network technology		x	x						
	Innovative End-user Services, applications and pricing		x	x	x					
	Innovation using handset advances and features		x	x	x					
	Fulfilling MNO regulatory requirements		x		x	x			x	
	Broader MNO Alliances and Organisational Developments		x	x	x		x	x	x	x
Appropriateness of MNO strategies	MNO Dilemma – balancing profitability and sustainability	Financial success factors	x	x	x					
		Regulatory Success Factors	x			x				
		Corporate Social Responsibility	x							
	End-user success factors		x	x	x					
	Impact of Introduction of new technologies	Prepaid – a positive impact of new technology	x							
		3G – a negative or neutral impact of technology	x	x						
		Possible impact of WIFI, WIMAX and VoIP	x				x	x		
	Impact of MNO Competition		x							
	Threat of Substitutes		x							

5 DISCUSSION OF RESULTS

Discussion of research findings will focus on the MNOs studied and findings related to the literature review and research findings topics.

5.1 Vodacom Discussion

Vodacom is the market leader in the mobile communications industry in South Africa, both in terms of subscriber marker share and revenue. Vodacom has a legacy organisation similar to Telkom South Africa as a result of the company previously being spun-off and partly owned by Telkom. Vodacom has a strong Marketing and Product Development focus and has been first to market with various offerings for example 3G. Operationally, Vodacom has challenges in that it has a strong head office and strong regional operations with a technical focus. Various functions are duplicated in the head-office and regional operations functions, adding operational overhead.

Vodacom has the advantage of being part of the Vodafone Group, having access to industry best practices and scale from operations in many countries and continents. Vodacom has proved to be successful in reaching low-income communities through innovative end-user offerings and a focus on reaching as many communities as has been financially and operationally feasible.

5.2 MTN Discussion

MTN has always been in second place when it comes to market share and revenue leadership. There was a time when MTN boasted a superior network with “The Better Connection” campaign launched as a result of an independent benchmark where MTN’s network proved to be better quality than Vodacom. MTN were first to launch prepaid charging, “Please Call Me”, MTN Zone Dynamic Discounting and LTE but Vodacom followed shortly thereafter and were able to achieve as good or better results than MTN as a result of the scale that Vodacom had in the market.

5.3 Specific Strategies taken by MNOs in South Africa

This section will broadly provide a discussion on the first sub-problem; to identify specific strategies adopted by mobile telecommunications operators in South Africa.

5.3.1 *Use of advanced network technology*

In both the MTN and Vodacom findings, the purpose of using technology is to increase coverage (reach) or availability requirements highlighted by (Tsuboya 2003) and (Anderson and Kupp 2008). Technology has also been an enabler for providing innovative end-user services like data services.

5.3.2 *Innovative End-user services, applications and pricing*

The researcher sees MNOs not being innovative enough to move beyond the success they have achieved using a voice-centric strategy. MNOs acknowledge the need to launch new revenue-generating services, write about these services in annual reports but are not able to show the substantial increase in revenue to be a substitute for voice revenue.

a. ***Distribution***

Effective distribution has been fundamental to both Vodacom and MTN achieving the subscriber reach and all relevant channels for example retailers have been used successfully by Vodacom and MTN.

b. ***Mobile Advertising***

The researcher notes the controversial nature of the “Please call me service” with a former Vodacom staff member laying claim to the intellectual property of the service (MyBroadband 2013). Both MTN and Vodacom have used “Please call me” as a tool for generating more voice revenue. The use of “Please call me” as an advertising tool happened more by accident and the mobile advertising potential of “Please call me” could have been better exploited by both MNOs.

With the advancement of mobile data, MNOs now have the opportunity to introduce innovative mobile advertising end-user offerings. If they do not do so, OTT players like Google and Facebook will exploit this revenue-generating opportunity.

c. ***Profitable Mobile Data Services***

The researcher comments that South Africa was early in providing fixed internet access using various Internet Service providers and the incumbent operator, Telkom. Fixed access however did not have the reach and did not offer the ease of use that Mobile Broadband offered end users. Vodacom and MTN are leaders in proving Mobile Broadband services in South Africa and have the opportunity to grow and diversify revenues by offering compelling end-user services like video streaming, social media and mobile advertising as an add-on to mobile data.

d. ***Mobile Entertainment Services***

The researcher notes that mobile entertainment and application portals have been replaced by mobile applications accessed through app-stores. MNO-controlled portals were initially successful but portals and application stores hosted by over-the-top (OTT) industry players like Google, Apple and Amazon have proved to be more successful than MNO-offered portals. MNOs may already have missed the window of opportunity to partner with OTT players to jointly launch app-stores and portals.

e. ***Shared access service***

The researcher comments that affordability of mobile handsets has meant that shared access voice is not compelling for MNOs as it was shortly after network launch. Additionally, Mobile Broadband has replaced PC-access to the internet as the end-user's preferred access to the internet.

f. ***Mobile Money / Mobile Commerce***

Safaricom Kenya has shown that MNOs can diversify and create sustainable revenue streams with Mobile Money or M-Commerce. South Africa's strong financial sector, dominated by four large banks FNB, Standard ABSA and Nedbank have led the way in banking the unbanked and rolling out mobile banking services.

There is an opportunity for Vodacom and MTN to convert their prepaid installed base into an M-Commerce installed base by marketing the service and upgrading charging and billing platforms. A transaction-based financial services model that can undercut the current banking fees could prove innovative and attractive to end-users demanding convenient and cheaper banking services.

There is also an opportunity for MNOs to play the intermediary role that VISA and Mastercard play in facilitating financial transactions hosted by banks. Further digitisation of money is possible by virtually holding money in an electronic or mobile wallet, reducing the risk of cash transactions, even for small transactions like paying for parking or transportation tickets.

Mobile Money or M-Commerce is potentially a revenue-generating opportunity that MNOs could further develop and roll-out.

g. ***Mobile Health***

The researcher comments that mobile data can act as an enabler for extending Healthcare to low-income communities. Operators have not reached consensus with Health care providers how to make M-Health services beneficial for end-users, operators and healthcare providers.

h. ***Other Value-added services (VAS)***

The researcher comments that MNOs should be moving away from MNO-led and branded VAS offerings but should collaborate with vertical industries, promoting other brands, creating revenue-generating value-added services through partnerships and revenue sharing with other industries. Examples of compelling partnerships would be partnerships with security, vehicle tracking or content / media companies.

5.3.3 *Innovation using handset advances and features*

Based on responses to interview questions, sections 4.3.1 and 4.3.2 adequately cover the use of handset advances and features and no further discussion is required on this topic.

5.3.4 *Fulfilling MNO Regulatory Requirements*

a. *Licence obligations*

Even though respondents did not say so directly, the researcher notes that the regulator in South Africa has not been effective in enforcing competition in South Africa. Voice calling tariffs increased from when networks were originally launched and it was only after extensive lobbying from the 3rd mobile operator that voice call tariffs were reduced (Gillwald 2005).

b. *Community services*

The researcher comments that with more affordable handsets being available and decreasing voice call rates, Community Service Telephones (CSTs) are not as effective as they were when first set up in the 1990s.

c. *Internet connectivity to schools and clinics*

The researcher comments that the Government of South Africa has more clearly stated the broadband connectivity requirement for schools and other government institutions in the National Broadband Plan document (Communications 2013). As part of extended licence obligations, MNOs would broadly be required to provide the levels of internet speed required by these government institutions.

d. *Provision of connectivity to low-income communities*

Apart from the initiative to provide schools internet connectivity, MNOs have not actively promoted connectivity to low-income communities. MNOs are driven by a sustainable business case when building out connectivity to any new community.

e. *Contribution to Universal Services Fund*

MNOs contribute the required percentage of their revenue to the universal services fund (USF). MNOs however question whether the fund is well managed and the funds are channelled in an effective way to promote Universal Service to unserved communities.

f. *Network Sharing*

Towers are shared by MNOs. When a new radio base station site is acquired by an MNO, the MNO usually exclusively uses the site for a period of 6 months or more the extract the most revenue from the site. Site sharing reduces site operational cost (site rental, power and transmission and site sharing is common in South Africa. More than 60% of macro urban sites in South Africa are shared.

Tower companies are actively assuming the management of shared sites in South Africa. The break-even point for a tower company to manage a site is around 1.5 tenants. Tower companies therefore encourage 2 or more MNOs to share sites to extract the most value from the site.

Apart from national roaming, active network sharing has not been implemented in South Africa. As part of the South African National Broadband plan, the Department of Communications are evaluating the open-access concept to use share the 800MHz radio resources currently used for broadcasting for mobile broadband use. This would imply a shared network model from day one with a wholesale network provider selling capacity to MNOs for further service provision to end-users. Open-access discussions are starting in other African countries, notably Rwanda, Kenya and Nigeria as part of national broadband plans.

g. *Tariffing regulation*

South Africa's mobile termination rates are one of the highest in the world. Even though mobile termination rates have dropped, Vodacom and MTN's revenue have not dropped showing elasticity in end-user voice spending patterns. There will be a point however when revenue will be flat or drop as a result of further reduction on mobile termination rates, negatively affecting the attractiveness of Vodacom and MTN to investors. At the point where voice revenue growth is flat or declining, MNOs need to make adequate provision for alternative revenue streams for example Mobile Data and Mobile Money.

h. ***Regulation of Interception of Communication (RICA)***

The researcher comments that RICA has caused MNOs to report lower subscriber numbers. The lower subscriber numbers have not however had a negative impact on MNO revenues and brand value.

i. ***Local MNO ownership***

Both MTN and Vodacom are strong South African brands with local ownership on the Johannesburg stock exchange and good broad-based black empowerment credentials. It is unlikely that Vodafone will increase it's shareholding in Vodacom more that the current level of shareholding.

5.3.5 *Broader MNO Alliances and Organisational Developments*

a. ***Market Positioning***

The researcher comments that the number 3 MNO in South Africa, Cell-C, has struggled to find the success that MTN and Vodacom have achieved. This confirms the research observation made by the MTN respondent to the research questionnaire.

b. ***WASPS***

The researcher comments that WASPs can be a useful alliance for the MNO where the MNO believes that its brand will not be diluted by this partnership.

c. ***Vodacom South Africa Organisation developments***

The researcher agrees that Vodacom should introduce operational efficiency to maintain competitiveness in the market.

d. ***Managed Services / Outsourcing***

The researcher comments that MTN have already taken steps to outsource network operations in West Africa and Nigeria (Ericsson 2014).

e. ***Tower companies***

The researcher comments that tower companies are introducing operational efficiency into the industry, with the target for tower sharing being 2.5 operators per site. Once this target is achieved, operators would then decide how best to operate tower and site infrastructure.

f. ***Mergers and Acquisitions***

The researcher comments that Vodacom's MNO acquisition targets in Africa should be in markets where there is subscriber and end-user services growth potential, targeting operators with a leading position (number one or number two) in the market.

g. ***Value-added Services (VAS) partnerships***

The researcher sees VAS partnerships as a sustainable strategy for future MNO growth and as a suitable way to reach low-income communities.

h. ***Vendor / supplier partnerships***

MNOs do not see vendors as strategic partners. Given the slow, flat or declining telecommunications revenues globally, both MNOs and their vendors may need to review their relationships to be more partnership-based so as to share the successes or risks associated with a rapidly changing industry.

i. ***The Emergence of Global Operator Groups***

The researcher comments that Vodacom has been the leading Vodafone operator for many years. Being part of the Vodafone group is bringing incremental improvement o Vodacom's go-to-market and operating model. Vodafone have also announced investment in fixed line operator Neotel (Mdluli 2014) and strategic capital investments as part of a global initiative called Project Spring (Spillane 2013).

5.3.6 *Discussion on Sub-Problem 1*

The research findings for sub-problem 1 summarised in section 4.3.6 confirms that offering innovative end-user services are the preferred strategy for reaching low-income communities in South Africa.

5.4 Appropriateness of Emerging Market MNO Strategies

5.4.1 *MNO Dilemma – balancing profitability and sustainability*

a. *Financial Success factors*

The researcher comments that even though MNOs are finding alternative revenue streams to voice, there is no clear strategy in place to fully compensate for the loss in voice revenue predicted in the future. Both MNOs studied have taken steps to reduce Network CAPEX and OPEX, with financial success in these areas being demonstrated in annual reports year-on-year.

b. *Regulatory Success Factors*

MTN and Vodacom have successfully been able to fulfil regulatory requirements and have seen ongoing operations as licence obligations have been adhered to. The relationship between MTN and Vodacom and the regulator, ICASA has however been strained over the past 4-5 years as a result of:

1. Decreasing interconnect fees, reducing operator revenue and
2. Not obtaining more spectrum to efficiently build out their networks.

Regulatory success factors are appropriate for ensuring ongoing operation, a supporting success factor rather than a critical success factor.

c. *Corporate Social Responsibility (CSR)*

Both Vodacom and MTN have strongly CSR activities, mostly focussed on initiatives involving government in particular initiatives focused on education. CSR ensure that

MTN and Vodacom are in right standing with government authorities. CSR is seen as a supporting success factor rather than a critical success factor.

5.4.2 *End-user success factors*

The research findings show that end-user success factors drive financial success factors. Going into the future, with the mobile market becoming saturated, operators like MTN and Vodacom will need to do more to retain existing customers (reduce churn). Interventions to reduce churn could be offering compelling, innovative end-user services, ensuring superior network quality and improved customer experience. Advanced networks tools like network optimisation and Customer Experience Management platforms may pay a role in reducing churn for MTN and Vodacom.

5.4.3 *Impact of Introduction of new technologies*

a. *Prepaid – a positive impact of new technology*

Prepaid charging has proved to be a critical success factor for MTN and Vodacom in that it has been the most important tool for revenue collection and it has been an innovative end-user service. Prepaid's real success has however been limited to voice charging. If MNOs are to ensure revenue collection from new end-user services in the future, the plain prepaid voice functionality may not be sufficient for new revenue streams to be sustainable.

b. *3G – a negative or neutral impact of technology*

3G has had a neutral impact in that it has provided new end user services. 3G has also had a negative impact in that it has not had the same revenue-generating impact that voice communications has had for MTN and Vodacom. Over-the-top and social media players like Google and Facebook have built their own end-user services on top of the data networks, eroding potential revenue MTN and Vodacom could have generated.

c. ***Possible impact of WIFI, WIMAX and VoIP***

The impact of WIFI, WIMAX and VoIP has not been quantified yet. These services or trends could potentially have a negative impact on MNO revenues and Vodacom and MTN would need to be prepared to partner with an Ecosystem player to reduce the negative revenue impact if they cannot launch compelling and innovative services to compete with WIFI and VoIP offerings.

5.4.4 *Impact of MNO Competition*

In South Africa, only MTN and Vodacom prove to have long-term sustainability in terms of revenues, operational and capital expenditure. Even though competition between MTN and Vodacom has been fierce, both have been able to maintain market share and revenue growth through similar market strategies. Going forward, the competition would be tougher as the market saturates with penetration levels above 100% and increased competition from non-telecommunications players or over-the-top service providers like Google, Facebook and Apple.

5.4.5 *Threat of substitutes*

Following on directly from the previous paragraph, MTN and Vodacom may find their competition shifting to non-telecommunications players or over-the-top service providers. This is in effect a substitute to traditional telecommunications services. Even though the substitution will not be 100%, the reduction in revenue growth will be felt as though market share is being lost.

5.4.6 *Discussion on the second sub-problem literature review*

Financial success factors far outweigh the regulatory and corporate social responsibility factors. Regulatory factors could be a qualifier for continued operation. Technology is seen as an enabler for innovative end-user services and innovative end-user services is seen as an enabler for financial success in the market.

6 CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

Mobile Network Operator (MNO) strategies to reach low-income communities in South Africa were studied in this report. The research involved identifying specific strategies and evaluating what made these strategies successful (success factors). Typical strategies investigated were innovative end-user services, expenditure efficiency and the use of advanced technology. Success factors identified include financial, regulatory and corporate social responsibility factors. This section summarises the research findings, seeks to make recommendations for MNOs and identifies potential areas for future research.

6.2 Conclusions of the Study

The research findings confirm the literature review finding that innovative end-user services are the most important driver for Mobile Network Operator (MNO) market success (Table 3) to reach low-income communities.

6.2.1 *End-user success factors*

Innovative end-user services are important to MNOs to attract and retain customers. By offering innovative and compelling end-user services, MNOs are able to generate better revenues. MNOs have been able to find end-user services that bring about financial success, creating shareholder value.

Prepaid charging has been the most important innovative end-user service, allowing users the freedom to buy airtime through various distribution agents in small denominations without the need for meeting strict financial constraints. Prepaid charging along with low-cost, sometimes subsidised handsets have helped MNOs in South Africa reach low-income communities. These factors that lowered the barrier to entry for low-income users have caused subscriber growth well beyond the market growth Vodacom and MTN had planned when launching mobile communication services in 1994.

Data services have proved to generate new revenue streams but have not been as profitable as voice services. One reason why data has not been as profitable as voice is because MNOs are not able to directly pass the value of the service on the end-users. In many cases, end-users using mobile data services access 3rd party over-the-top applications like Social Media (Facebook, Twitter, Google and Whatsapp) and Video Streaming services like Youtube, end-user services that MNOs are not able to monetise directly.

New end-user services like M-Commerce, M-Health and Education are being introduced by MNOs but the real success of these have not been proven in the South African context. The success of M-Commerce in Kenya has not been realised in South Africa because of a strong local financial services industry and regulatory conditions requiring that MNOs partner with financial institutions to roll out mobile financial services.

Mobile operators have only been able to partly monetise the mobile advertising opportunity, again Over-The-Top players being more successful in capturing the mobile advertising market by running advertising on websites, social media and media portals.

Market saturation and slowed organic growth in the mobile communications industry in South Africa has led MNOs to explore innovative ways of reducing churn, maintaining market share and revenue growth. Voice over IP (VoIP) and other over-the-top end-user services offered by industry players like Facebook, Apple, Microsoft and Google could in future be a threat for Mobile Operators revenue streams, potentially needing MNOs to rethink their market positioning and end-user offerings.

6.2.2 *Use of Advanced Technology*

Advanced technology proved to be an enabler for innovative, revenue-generating end-user services.

6.2.3 *Managing CAPEX and OPEX*

Operator CAPEX and OPEX spend is less of a lever for MNO success compared to revenue-generating success factors. Both MTN and Vodacom prove to have strong

operations organisations and are constantly reviewing ways to optimise operational and capital expenditures, thereby contributing to financial success factors.

6.2.4 *Regulatory and Corporate Social Responsibility success factors*

Regulatory and Corporate Social responsibility proved to be less of a success factor for MNOs compared to the financial success factors. The research findings however show that it is important for MNOs to be in good standing with regulators and government for future ongoing operation, brand performance and financial success in the market.

6.3 Recommendations

Based on the research findings, the author recommends the following strategies for MNOs to reach low-income communities:

1. MNOs in South Africa review their dependence of mobile voice revenues in particular with the threat of the over-the-top players being evident,
2. MNO's identify and implement industry mobile broadband best practices and evolve data offerings to make them more customer-centric and profitable,
3. Operators understand the threat of revenue loss due to over-the-top (OTT) players like Facebook, Apple, Microsoft and Google and put risk mitigating plans in place to minimise the loss of revenues due to OTT players,
4. MNOs continue to look at innovative and profitable end-user services for example TV and Media, M-Commerce, Health and Education, exploring partnerships with other industries like financial institutions, health industry players, government, advertisers, media or content houses and potentially over-the-top players like Facebook, Apple, Microsoft and Google to diversify revenue streams and reduce subscriber churn and
5. MNOs review operating models like infrastructure sharing and outsourcing to ensure efficient use of operation expenses budgets.

6.4 Areas for further research

Suggestions for further study include:

1. Exploiting Mobile Advertising as a future revenue stream for MNOs,
2. Critical MNO success factors for new services like M-Commerce, M-Health and Education,
3. The impact of over-the-top (OTT) services on MNO strategy in South Africa and
4. Exploring MNO / Content Provider, Broadcaster and other vertical industries partnerships for mutual financial benefit, MNO revenue growth and diversification of revenue streams.

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APPENDIX A: INTERVIEW QUESTIONNAIRE

No.	Question	Answer format
1.	Briefly outline your company's strategies to reach low-income communities. In your opinion, are these strategies sustainable and can they be profitable?	Text
2.	Please provide an overview of data services offered by your company and could you comment on the profitability of these data services	Text
3.	Do you offer shared access for low-income communities? If yes, can you please provide info on the effectiveness, reach, profitability and success of shared access models.	Text
4.	Is fulfilment of Licence Obligations a critical success factor for your company? Briefly outline the importance of your company's Regulatory or Licence Obligations.	Text
5.	Are there specific CAPEX and OPEX reduction initiatives that you know of or are involved in? If yes, please provide details on CAPEX and OPEX reduction initiatives.	Text
6.	Would your company consider using shared networks as a means for reducing CAPEX and OPEX? If yes, with whom? Are there any regulatory and competitive issues you foresee with introduction of Shared Networks.	Text

7.	Are you aware of initiatives to outsource part of your company's units? If yes, please provide details.	Text
8.	Rank the following in order of importance: • Shareholder Value • Network Quality • Fulfilling Regulatory / Licence Obligations • Market Share (subscribers relative to country population) • Compelling new (value-added) services • Operational efficiency	Ranking 1 to 6

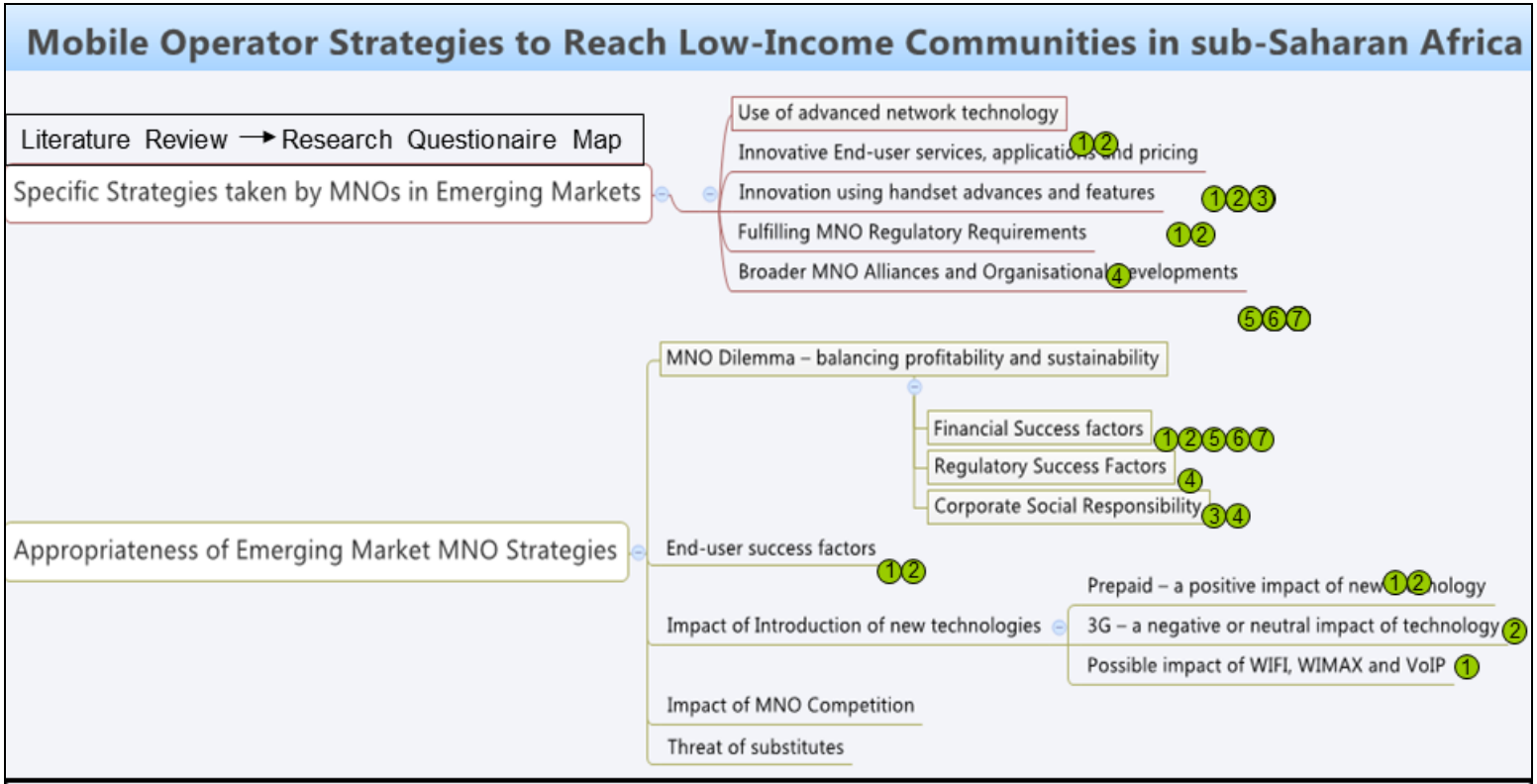
APPENDIX B: RESEARCH CONSISTENCY MATRIX

Table 4: Research Consistency matrix

Research problem: **To identify specific strategies adopted by mobile telecommunications operators in emerging economies to reach low income communities in a profitable and sustainable manner**					
Sub-problem	**Literature Review**	**Hypotheses or Propositions or Research questions**	**Source of data**	**Type of data**	**Analysis**
The first sub-problem is to identify specific strategies adopted by mobile telecommunications operators in emerging economies.	(Anderson and Billou 2007), (Anderson and Kupp 2008), (GSMA 2005) (Beckman and Smith 2005), (Chetty et al. 2006) (Donner 2008) (Engvall and Hesselmark 2004) (Fink et al. 2003), (Henten et al. 2004) (Koski 2007) (Mallalieu 2007), (McCormick 2005) (Tsuboya 2003), (Zibi 2006),	Innovative end-user services are a preferred strategy used by MNOs in South Africa rather than introduction of new technology.	Existing Case Studies Questionnaire / interview with two MNOs Data from MNO annual reports. Articles on MNO not included in literature review	Subjective, qualitative data	Case study analysis to derive theory and findings

Research problem: **To identify specific strategies adopted by mobile telecommunications operators in emerging economies to reach low income communities in a profitable and sustainable manner**					
Sub-problem	**Literature Review**	**Hypotheses or Propositions or Research questions**	**Source of data**	**Type of data**	**Analysis**
The second sub-problem is to justify the appropriateness of specific strategies adopted by mobile telecommunications operators in emerging economies to reach low income communities in a profitable and sustainable manner.	(Anderson and Billou 2007), (Anderson and Kupp 2008) (Banka 2006), (Zibi 2006). (Donner 2008) (Fink et al. 2003), (Gerpott and Jakopin 2005), (Katsianis et al. 2001). (Mallalieu 2007). (McCormick 2005).	Appropriateness of strategies used by MNOs can be measured in terms of financial, regulatory and Corporate Social Responsibility success factors.	Existing Case Studies Questionnaire / interview with two MNOs Data from MNO annual reports. Articles on MNO not included in literature review	Subjective, qualitative data	Case study analysis to derive theory and findings

APPENDIX C: LITERATURE REVIEW - QUESTIONNAIRE MAP



1 Briefly outline your company's strategies to reach low-income communities. In your opinion, are these strategies sustainable and can they be profitable?
2 Please provide an overview of data services offered by your company and could you comment on the profitability of these data services
3 Do you offer shared access for low-income communities? If yes, can you please provide info on the effectiveness, reach, profitability and success of shared access models.
4 Is fulfilment of Licence Obligations a critical success factor for your company? Briefly outline the importance of your company's Regulatory or Licence Obligations.
5 Are there specific CAPEX and OPEX reduction initiatives that you know of or are involved in? If yes, please provide details on CAPEX and OPEX reduction initiatives.
6 Would your company consider using shared networks as a means for reducing CAPEX and OPEX? If yes, with whom? Are there any regulatory and competitive issues you foresee with introduction of Shared Networks.
7 Are you aware of initiatives to outsource part of your company's units? If yes, please provide details.
8 Rank the following in order of importance: •Shareholder Value, Network Quality, Fulfilling Regulatory / Licence Obligations, Market Share (subscribers relative to country population), Compelling new (value-added) services, Operational efficiency

GLOSSARY

3G	Third Generation Mobile Network
ARPU	Average Revenue Per User
CAPEX	Capital Expenditure
CSR	Case Study Research
CST	Community Service Telephone
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortisation
GIS	Geographic Information System
GPRS	General Packet Radio Service
GSM	Global System for Mobile Communication
IN	Intelligent Network
ITU	International Telecommunications Union
KPI	Key Performance Indicator
LTE	Long Term Evolution
MMS	Multimedia Messaging Service

MNO	Mobile Network Operator
OPCO	Operating Company
OPEX	Operational Expenditure
OTT	Over-the-top
PC	Personal Computer
R&D	Research and Development
SIM	Subscriber Identification Module
SMS	Short Messaging System
TCO	Total Cost of Ownership
USAASA	Universal Service and Access Agency of South Africa
USAL	Underserviced Area Licence
USF	Universal Service Fund
VAS	Value-added Services
VoIP	Voice over Internet Protocol
WASP	Wireless Application Service Provider

WIFI	Wireless Fidelity
WLAN	Wireless Local Area Network