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Provision of Universal Service in the South African Telecommunications Market

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A research report submitted to the Faculty of Commerce, Law and Management, University of the Witwatersrand, in partial fulfilment of the requirements for the degree of Master of Business Administration

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ABSTRACT

While telecommunications costs are a common topic of public comment in South Africa, the provision of services to those areas and communities which have been historically neglected also is a focus for commentators in the industry. This research aimed to investigate the effectiveness of the universal service policy and programmes which are in place in South Africa by evaluating the different perspectives of both the regulatory and private sectors. The research furthermore was undertaken with a desire to determine what could be done to advance Universal Service in the country.

The approach taken was firstly to analyse the relevant documentation, such as licences, annual reports and legislation, to determine the formalised status and then to interview different respondents from the industry as a whole and obtain their perspectives on the different focal aspects. The responses and the secondary research were analysed as a whole to enable the researcher to establish the underlying themes which are evident in the industry at the moment as related to the topic.

Overall, the findings and interpretation identified the primary themes of Direction and Delivery. These themes essentially outlined the general intentions that exist for providing service and that service provisioning is successful in some aspects. There is an overall shortage, however, of strategic direction with regard to what the policy should achieve, a need for greater co-operation and alignment within the industry and lack of sufficient and relevant skills and resources to actually drive the implementation of policy effectively.

DECLARATION

I, Carl André von Aulock, declare that this research report 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, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

Carl André von Aulock

June 2008

DEDICATION

This research project and the MBA degree as a whole are dedicated to my late father, Johannes Nikolaus von Aulock. I hope he would have been proud.

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I should like to extend my thanks to everyone who has assisted me in completing this research and the MBA studies as a whole, including my lecturers and classmates who helped greatly in keeping me motivated when the going became tough.

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My wife Lydia:

> Thank you for believing in me and for your constant encouragement and patience.

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GLOSSARY OF TERMS

Access Deficit Charge: A charge levied on operators not providing universal service to compensate others who incur expenses, an external cross subsidy.

Black Economic Empowerment (BEE): An initiative in South Africa aimed at redressing past economic discrimination on racial grounds by promoting the granting of access to opportunities to previously disadvantaged groups to encourage redistribution of wealth.

Convergence: In this context, convergence refers to the technological convergence of the fixed and mobile technologies resulting in the ability to provide multiple voice, data and television services (triple-play) on the same technical platform.

Operator: Public or private company licensed to build and operate a telecommunications network and provide communications services to the public.

Teledensity: Also referred to as penetration – this is generally the measure of the per capita number of connections/telephones. The measure can be per person, per region, etc. It is primarily applied to fixed line technology network infrastructure measurement.

Universal Service: The policies and processes of making communications services available and affordable to the broader population of a country on an individual basis and supplying a combination of services over and above basic voice telephony.

Universal Access: The provision of basic access to telecommunications connectivity on a community or public service level ultimately targeted at individual direct access to infrastructure. This is treated as an included sub-set of universal service in this research.

1 INTRODUCTION

1.1 Purpose of study

The purpose of this research is to evaluate the degree to which the goals of the Universal Service and access policies of the South African Telecommunications regulatory authorities have been met. The research will also investigate different models and initiatives to determine what could be considered to accelerate and promote the expansion of communications infrastructure and services within the target areas of these policies.

1.2 Context of study

The global deregulation of the telecommunications industry and advances in technology, have resulted in the rapid development and deployment of communications systems and services. Together with increased competition, the accessibility of these services has been extended to many people who previously had no connection to communications infrastructure. However, the profit-driven nature of these services also determines that not all groups will be served, due to the unprofitable nature of the business models for the lower income and density areas and target groups. Governments and regulatory bodies therefore have to establish programmes and initiatives to encourage or force the market to serve such areas (Smith and Wellenius, 1999:644).

Universal Service was originally used by Bell systems as their brand name for a total connectivity concept, and was intended to eliminate the fragmentation of the deregulated networks in the United States (Mueller, 1997). This goal was achieved by means of regulatory policies that unified the industry players. By the 1970s the term had resurfaced with a focus towards making services available and affordable to all potential consumers (Mueller, 1997). It is in the context of this definition of universal service that the current study is being conducted. It is important to note that, for the purposes of this research, Universal Access goals will be measured on their own merit, but are included as part of the total universal service topic.

Historically, the incumbent fixed line operator, Telkom, has dominated the South African telecommunications market, but the ongoing deregulation of the market since 1994 has allowed new operators to enter the market and provide voice and data services, particularly in the mobile sector. The introduction of mobile cellular telephony drove an increase in access to telecommunications, with the number of connected users expanding exponentially to more than 28 million subscribers by 2006. This large-scale uptake of services has been a significant revenue generator for the operators, as well as a contributor to the economic growth of the country as a whole.

Within this environment of deregulated profit-driven growth in connectivity, the Department of Communications (DoC) and the Independent Communications Authority of South Africa (ICASA), have attempted to address the needs of the broader population within the realm of universal service. The methods used range from Universal Service Obligations (USO) as part of the conditions of operating licenses, through to the establishment and issuing of small restricted regional licences aimed at specific geographic areas and population groups which have to date been neglected by the national operators, to new Black Economic Empowerment (BEE) operators.

Within the global community, the South African approach of establishing the Universal Service Agency (USA) in order to tackle the universal service and access issues is being watched closely (Milne, 1998). Political opposition parties, in particular, as well as other industry commentators in South Africa, view the Universal Service Agency and its programmes as a failure (Vecchiatto, 2007). Independent researcher Paul Cole (in Mochiko, 2006a; 2006b) has also attributed the failure of the USAs programmes to poor guidance from the state and resulting in increased costs to consumers, while simultaneously depriving the country of potential social benefits from communications connectivity (Mochiko, 2006a; 2006b). This study aims to determine what level of success has been achieved against the goals of the

Universal Service policy and, in relation to that success, what alternatives can be employed to further enhance the delivery of the services envisaged within the ambit of Universal Services.

1.3 Problem statement

1.3.1 *Main problem*

The purpose of this research is to determine the extent to which the goals of the Universal Service policies have been attained and to establish what types of additional or alternative models and initiatives should be investigated to encourage the expansion of communications services for the attainment of the Universal Service objectives.

1.3.2 *Sub-problems*

The first sub-problem is to determine the extent to which the goals of the Universal Service policy have been achieved and the possible reasons for any deviations from them.

The second sub-problem is to establish what additional or alternative models and initiatives should be investigated to encourage the expansion of communications services for the attainment of Universal Service objectives.

1.4 Significance of study

The study contributes to the theory by evaluating the success of the Universal Service provisioning structures and programmes in place in South Africa and by suggesting alternative programmes or strategies that may be available to regulators to achieve the envisaged goals in South Africa and elsewhere.

The study will provide guidance to regulators on the effectiveness of policies and programmes used in providing information and communications services in terms of the Universal service definitions, through evaluating the success to date of the South African model.

The research will furthermore provide guidance to network operators in the sector as to how their obligations relate to other network operators, as well as some insight into how these have been addressed. The research aims to provide the industry as a whole with insight into the challenges facing them in the achievement of the universal service and access objectives in the country.

1.5 Delimitations and limitations

1.5.1 *Delimitations*

The research will only focus on the regulatory and market situation within the South African telecommunications market. The report will only investigate the impact of these regulatory frameworks on the South African operations of the network service providers and not their obligations in terms of any other markets in which they operate outside of the South African market or telecommunications industry.

The report will not attempt to investigate the broader economic implications of the roll-out of communications in terms of the Universal Service Obligations. The report will also not look at the direct financial implications of providing services in terms of the universal service obligations or in general in under-serviced areas. The direct and detailed economic implications resultant from universal service provisioning is therefore outside of the scope of this research. The economic aspects related to pricing, subsidies and financing, etc. as directly affecting the provision of services will be considered as and when it is relevant to the research.

The research will not attempt to determine the exact cost and feasibility of any proposed alternative models that may be identified. The business related issues regarding the feasibility of these proposals would be a topic for separate further research.

1.5.2 *Limitations*

The research will be limited to companies operating and located in South Africa and will not extend beyond the country's geographic boundaries. While the research will be limited to South Africa, the concepts could possibly be applied to other countries for purposes of comparison on a high level.

1.6 Assumptions

The first assumption that has to be considered is that the concept of Universal Service is clearly understood by all the relevant parties within the telecommunications industry. As the concept of universal service is a global one, the assumption is in general reasonable. Should this assumption prove to be false, the reliability of the feedback from the interviewees would be questionable.

The second assumption is that the conditions agreed upon with regard to the Universal Service Obligations of the licensed national operators, if any, are clearly understood by those operators. This is an acceptable assumption as these conditions would be clearly stated within the licence documentation. The research is sensitive to this assumption, however, as, should the operators not understand their obligations, their behaviour and delivery in terms of the licence would fundamentally affect the measurement of success.

No other significant assumptions that could impact on the viability or reliability of the research have been identified.

2 RESEARCH METHODOLOGY

2.1 Research methodology /paradigm

The purpose of this research was to establish the success of the Universal Service policy in South Africa, as well as possible steps which could be taken to meet the policy goals. The research utilised a mixed method approach to address the two sub-problems and improve both the validity and reliability of the research through providing a basis for triangulation of the findings, in this case between the literature, the documentary findings and the primary research responses (Kiessling and Harvey, 2005).

As the first sub-problem was focused on the measurement and analysis of the current status of universal service in South Africa, a quantitative method of analysis was appropriate as the techniques are focused on "…measuring things which can be counted" (Kiessling and Harvey, 2005:29).

"Qualitative research is concerned with the quality or nature of human experiences and what these phenomena mean to individuals" (Draper, 2004:642). The research was intended to gather information about perceptions and experiences in order to draw meaningful conclusions and develop valuable suggestions which could be utilised by other interested parties.

As qualitative research places an emphasis on meaning and understanding (Draper, 2004) its utilisation in the second part of the research was appropriate, as the research goal was to not only quantify the achievement of universal service, but to understand why there is a perception of failure and how this could be resolved or mitigated.

2.2 Research design

The research was conducted in two parts, with the use of a mixed method approach and utilising a combination of secondary and primary research techniques.

The first part of the research was directed at gathering data through conducting secondary research to determine the current status of the Universal Service policy in South Africa. The secondary research aimed to determine the structures, goals and processes established by the regulatory authorities to implement the concept of universal service. This section of the research would also evaluate the extent to which those formal targets had been met by the parties to whom the responsibilities where allocated.

The outcome of this section of the research would be a matrix of goals, responsibilities and related results. These would be aligned to the theory by positioning the country in terms of the Stages of Universal Service Policy, as defined by Milne (1998).

The second part of the research utilised a qualitative in-depth interview method to gather data. This research took the form of primary research through utilising in-depth interviews conducted with experts in the industry. The interviewees and their roles are listed in the interview schedule in Appendix A.

The interviewees were selected on the basis of their involvement in the universal service process and programmes, as well as their knowledge of the market and industry in South Africa. The aim of the primary research was two-fold:

- Firstly, to establish the perceptions of the current situation with regard to universal service achievement and,

- Secondly, to establish what additional or alternative steps could be taken to achieve the goals effectively and efficiently, on the basis of the interviewees' experience.

This mixed method approach was chosen due to the nature of the research problem. The approach would establish a qualified, fact-based standard in the first part on which to build the analysis of the primary research conducted in the second part. The advantage of this was seen to be that the basis for discussion during the interviews would be consistent and reliable as it comprised publicly available information. The primary research interviews could therefore be conducted and the outcomes analysed in relation to reality and not only perceptions. At the same time, the disadvantage would be that, should there be a lack of data or be flaws in the recorded data that was utilised for the secondary research, the outcomes of the interviews could potentially be distorted. This situation would, however, still be acceptable within the objectives of the research, as this would highlight potential discrepancies in the overall actual situation vs the reported situation.

2.3 Population and sample

The researcher has been working in sales for a major supplier within the telecommunications market, which has provided insight into the structure of the industry and the challenges facing it. This experience enabled the researcher to gain access to the relevant sources for both the primary and the secondary information. The experience of working in the industry also provided the researcher with an insider view of some of the current issues which are topical. This also made it possible to know where to focus for relevant information and expertise.

2.3.1 *Population*

The population for the research in its broadest sense comprised all companies and organisations involved in the provision of telecommunications services within South

Africa. This included regulatory bodies, network operators, equipment suppliers and consultancy companies. The network operators in the population included the full range of operators, from national fixed and mobile network operators through to service-specific operators such as broadcast, long haul transmission, small regional network operators and Internet Service providers (ISP).

2.3.2 *Sample*

For the purposes of the secondary research, the sample was not restricted to any one particular organisation. As the secondary research comprised largely quantitative-based collection and analysis of data applicable to the topic, the sample could not and should not be restricted in such a way. However, the data analysed were restricted in terms of content to what was relevant to the study, such as policy documentation, business plans and execution data, and did not include the analysis of business plans or similar documentation. Further details on the data collection are included in point 3.4 below.

In contrast to the secondary research, the primary research was qualitative in nature and applicable to organisations in the industry; the method used to choose the sample was based on accessing the most prominent or dominant organisations in the industry. The sample was determined through the selection of target organisations and specific roles in those organisations whose functions included relevant knowledge of the topic. Independent individuals extensively involved in the universal service activities were also selected on the basis of recommendations from colleagues who are active in the industry. The selection of the organisations was based on their level of involvement within the industry and, more specifically, the potential level of influence which Universal Service would have on their operations. Additionally, to ensure comprehensive understanding of the challenges facing the implementation of universal services, other organisations not directly involved in telecommunications, such as financing institutions, were also included in the sample.

Details of the individual representatives and independent individuals selected can be found in Appendix A. The target was a sample of between 10 and15 respondents.

2.4 Data collection

As the research was conducted by using a mixed method and combination of data sources, the data collection techniques were adapted accordingly.

The secondary data for both the quantitative and qualitative analyses were collected from sources in the public domain and, where not accessible, were requested from the responsible parties. Most of the information required in terms of regulatory frameworks, policies and implementation statistics is published information and was collected from the internet and research papers or reports already published. Sources for this data included the websites of the Universal Service and Access Agency of South Africa (USAASA), ICASA, the DOC and companies identified as part of the sample population. The South African government internet site contained a large amount of the required information, although the publishing of the information was significantly delayed in some cases.

Prospective interviewees were initially contacted telephonically to inform them of the purpose of the research and to establish their willingness to participate in the research process. Introduction and initial contact were established through utilising business contact channels available to the researcher due to working in the industry and, in some cases, by simply telephoning the prospective interviewees.

The interviews were conducted by the researcher in person, utilising a semi-structured questionnaire. An example of this questionnaire can be found in Appendix B. The outcomes of the interviews were recorded as follows:

- Notes were be taken by the interviewer during the course of the interviews.

- With the permission of the interviewee, the interviews where recorded, where possible.
- Recordings of interviews were reviewed and summarised in combination with the notes taken to ensure consistency of the findings from the interviews.

2.5 Data analysis and interpretation

The analysis of the data obtained in the course of this research was combined in terms of content analysis in order to provide a meaningful structure for the analysis of the data and correspondence and provide realistic and cohesive findings and recommendations. While there was a quantitative component to the analysis, the interpretation focused on analysing the primary research in conjunction with the data obtained to formulate the appropriate conclusions.

2.5.1 *Secondary Research Analysis*

The secondary research content was analysed in terms of the focus areas identified in the literature review and aligned to the different research questions which were raised. This analysis was then used to inform the primary research process in order to maximise the value of information obtained from the interviews by providing a qualified base for discussion.

The purpose of the secondary data analysis was to provide insight into the industry's structure and programmes, as well as the structure as related to Universal Service. The secondary data were analysed and presented in the form of tables, where relevant. Due to being largely text based, however, it is better understood through more detailed documentation of the relevant sections.

2.5.2 *Primary Research Analysis*

> Qualitative research methods are designed to describe and understand certain patterns of behaviour by accessing intentions, motives, beliefs, attitudes, rules and values that lie behind them and make actions and behaviour meaningful.
>
> (Draper, 2004)

The outputs from the in-depth interviews were analysed in order to determine common themes and issues which had been raised. These themes and issues were categorised into different focus areas based on the literature review structure, where possible, and their applicability in terms of the theory was then determined. The theme analysis and interpretation were conducted with reference to the secondary analysis to ensure consistency between the documented findings and respondent's opinions. This also assisted in identifying and eliminating, where possible, any bias in the responses.

The importance of the issues identified in the themes was determined by means of the frequency of occurrence and commonality among respondents, together with analysing the interview responses to determine those which were of highest importance to the respondents.

The researcher was then able to present a qualified response to the research problems and research questions which have been posed.

2.6 Validity and reliability

The applicability and quality of research is determined by the degree to which the research is valid and reliable. Qualitative research in particular has been subject to the impression that it is of a more subjective nature and the validity and reliability of

the research is therefore questioned. For this reason, the rigor of the analysis and interpretation of findings needs to be clearly addressed in order to allow readers to assess the appropriateness of the methods of collection and analysis (Draper, 2004).

2.6.1 *External validity*

External validity is referred to in terms of how easily the given results can be generalised or replicated in another context (Garza, 2005). In the case of this research, the global nature of the telecommunications industry would allow application of the findings or insights of the research in other countries within the realm of the universal service requirements of telecommunications. The concepts, challenges and requirements would be applicable as the overall industry drivers and requirements are similar at a global level. The direct applicability of specific actions or recommendations to these other markets would require consideration of the situation in the particular country from an economic, social and regulatory perspective.

Similarly, while the concept of universal service applies to many different industries, the drivers, regulations and market situations will differ in each industry, which will make it less applicable. Generalisations could be made in terms of social and financial implications, as well as management and execution requirements.

2.6.2 *Internal validity*

Internal validity can be summarised as whether the research investigated what it set out to study (Garza, 2005). The utilisation of the mixed method approach allowed for triangulation between the different secondary and primary sources of information to ensure that the research problems were addressed and that the conclusions drawn are not unreasonable or inapplicable. The information gathered during the secondary research phase was utilised to inform the primary interview-based research and the findings were aligned with the research questions to ensure that the original research problems were answered. The qualitative nature of the research introduced the possibility of including additional information, which was not considered or expected initially, in findings.

2.6.3 *Reliability*

Due to the use of the mixed method approach, the reliability of the data needed to be considered from two perspectives: that of the secondary data analysis and the qualitative interpretive analysis of the primary research.

The secondary research would present reliable results if conducted by another researcher as the data utilised in the present investigation will be published, official information dependent on a personal interpretation. While the methods used to present this information in another piece of research may differ from those of the present research, data from a particular point in time will not change. New information could become available, however, which may inform the research further. As the secondary research is based on documentary evidence and not derived from perceptual or emotive sources, the data utilised may be considered reliable.

In order to ensure the reliability and consistency of the qualitative portion of the research, the researcher conducted all interviews and analyses himself. In this way, the outcomes and interpretation would be consistent within the research. Due to the interview process and the possibility of the context changing, it is doubtful whether exactly the same conclusions will be drawn by another researcher. The potential for bias from the respondents does exist, as their personal experiences and opinions formed the basis for this research. If the research is repeated, these biases may also result in different outcomes due to changes in the business environment as well as in respondents' perceptions. The researcher attempted to mitigate this risk by focusing those portions of the primary research which were susceptible to bias on factual rather than emotive elements. It has to be recognised, though, that personal attitudes towards the topic need to be considered in the analysis, as these could result in different findings related to the topic.

3 LITERATURE REVIEW

3.1 Introduction

The purpose of this literature review is to provide the researcher and the reader of this report with a basis from which to understand and interpret the findings of the research itself. The review will aim to provide an understanding of the concepts that will be discussed in relation to Universal Service policies within the telecommunications industry. From this perspective, the review will examine what the aspects are which need to be addressed when implementing Universal Service and how these have been addressed globally. The literature review will provide the basis for and give rise to the questions which will be addressed in the course of the current research.

The literature that is evaluated in order to provide this basis for understanding covers regulatory, financial, competitive, implementation and market factors within the broader telecommunications market, and more specifically in relation to Universal Services. Cognisance of all these factors is important as all of them play a role in measuring the success of implementation, reliably evaluating reasons for failure and determining realistic alternatives. These factors will be discussed within a number of broader areas, most notably:

- Defining Universal Services and Universal Access
- Factors in Implementing Universal Service
- Operator-based perspectives
- Measuring the success of Universal Service

3.2 Defining Universal Service

Universal Service, according to a simple definition, is ”making telecommunications services available and affordable to a greater fraction of the population” (Peha, 1999). The means of delivering these services to that fraction of the population has taken on a number of different forms. The Universal Service Obligation (USO) is one of the concepts employed in the process of achieving this goal and it signifies that the network operators are under a provisioning obligation from the regulator as a condition of their network operating license (Blackman, 1995). The requirements of this license condition cover geographic, pricing, quality of service and cost aspects which need to be considered by the operator. Essentially, the obligations require the operator to provide services in terms of universal service when rolling out their communications network, governed by the programmes and requirements put in place by the national regulator.

While the concept sounds relatively straightforward, Blackman (1995) highlights some pertinent questions which can be asked, such as: “What do we mean by the terms ‘Universal Service’?”, “How much does it cost?”, “Who should pay for it?“ (Blackman, 1995:171). The obligations for universal service have in the past fallen on the incumbent operators (Hoernig and Valletti, 2002) and, in some cases, still do. This was largely due to the monopolistic nature of the telecommunications industry, which resulted in the only available supplier being the said incumbent (Chone, Flochel and Perrot, 2000; Cremer, Gasmi, Grimaud and Laffont, 2001).

Further to the question of basic services, the goals related to universal service are also different, depending on the maturity of the network and country in which the network is. (Milne, 1998). The definitions and understanding of these concepts need to be understood before the success of a universal service policy can be analysed.

3.3 The scope of Universal Service

According to Milne (1998), the common features in telecommunications markets with respect to Universal Service can be unified in the approach of “fulfilling basic needs for telecommunications”. However, Blackman (1995) questions whether broadband services should not be part of universal services due to the internet becoming such an important requirement for personal and social development. Therefore, when evaluating the goals and delivery against the goals of universal service, what could potentially form part of the scope of the work needs to be clearly defined.

The scope of works, as it were, can again be segmented, however, between the market being addressed and the technologies or services which are to be provided.

3.3.1 *The people aspect*

The market to be addressed by Universal Service policies has been defined differently in different countries. In the developed world, universal access is defined as having a telephone in every household, while in developing countries the definition differs, depending on the country and economic status. The universal access target ranges from telephones in every urban house and communal phones in rural areas in Columbia to one phone per community in Zambia (Bhuiyan, 2004). This difference in the definition of universal service or access according to areas results in its being difficult to measure relative success in implementation-based teledensity statistics alone. The difference illustrates an important determinant of the extent of universality which is per capita GDP. Developed countries with higher income levels have been found to have higher penetration rates than developing economies (Intven, Oliver and Sepulveda, 2000).

The market that needs to be addressed through the Universal Service Obligations is also segmented differently in terms of required reach. The obligations in Ghana, for

example, do not specify any restrictions in terms of location for the USO criteria, which meant there was little incentive to expand into the low ARPU areas when the network was built (Peha, 1999).

In general, however, the coverage for a universal service obligation and the policies driving it are aimed at those consumers normally considered non-profitable. These include low-income groups and outlying and rural communities. (Blackman, 1995; Milne, 1998; Chone et al., 2000; Bhuiyan, 2004) In addition to these, though, when looking further into where the finances go, Hammond (2005) found that the demands also extend to special groups such as school-age, indigent and other rural groups and some even suggested that unemployed jobseekers could receive free or subsidised phone cards or voice mailboxes to assist them in finding employment (Blackman, 1995).

3.3.2 *The technology and service aspect*

As indicated above, the basic concept from Milne (1998) and Blackman (1995) is that Universal Service policies and obligations were originally intended to address the need for a telephone connection in every home (Blackman, 1995). However, as the technologies have developed and society becomes more and more digitally orientated, questions have begun to arise as to whether the definition of universal service should not be extended. The extension of the USOs to include the roll-out of broadband is crucial in preventing the widening of the digital divide between those with and those without access (Xavier, 1997). While Xavier initially focused on the developed countries, Bhuiyan (2004) argues that developing countries should also address the need for more enhanced services in order to address the divide between the information haves and have-nots. In Nigeria for example, the goal of the Universal Service Provision Fund is “To enable all Nigerians to have access to all forms of modern Information and Communication Technologies and Services” (Senge, 2006:1).

Sawhney (2000) however warns that caution should be exercised when expanding the universal service beyond the basics in all cases, because different people have varying information needs. Similarly, whether just providing a connection will be sufficient to create a capable public in terms of the information and economic requirement is questioned by Martin (1997, in Sawhney, 2000)). Additionally, Compaine and Weinraub (cited in Sawhney, 2003) caution that "if the concept of what should be included under the universal service label is to be expanded beyond POTS (Plain Old Telephone System), then there needs to be an empirical justification beyond some intuitive assertion". Shanmugavelan and Warnock (2004) additionally argue that, with the rapid technological advancements and decreasing costs of these technologies, governments need to look at creative strategies for the provision of the services.

3.3.3 *Conclusion*

In summary, literature suggests that there are a number of different models and structures which are utilised in implementing Universal Service policies. The extent of the coverage, both in terms of the population as well as the services offered, should be clearly defined and understood before any conclusions on the success of the implementation can be drawn. The literature also suggests that these definitions are dependent on the country and specifically on the maturity of the networks and economies in question. The stage of the telecommunications life cycle, be it developing through to established, as per Milne (1998), can be used to hypothesise what the goals of the policy makers will be. It must be noted, however, that the environment can be between stages and have overlapping stages, which makes the definition of singular goals more problematic.

Research Question 1: The question arising from the literature is directly in support of the research problem itself. What are the goals which are to be achieved under

the banner of universal service in South Africa in terms of the target markets and services which will be supplied?

3.4 Implementing Universal Service

The theoretical role of a regulator is to maximise the benefit to the national interest from the relevant industry through the execution of their mandate as established in the relevant legislation. This role is subject to a number of influencing factors in the form of government and private organisations that will either directly affect or lobby their own interests (Viscussi, Harrington and Vernon, 2005).

The liberalisation of the telecommunications industry and the resultant challenges facing regulatory bodies, have been a source of contention for a number of years. The establishment of policies which encourage and protect competition while simultaneously ensuring the implementation of services in terms of Universal Service goals has become a significant challenge to regulators (Barros and Seabra, 1999; Chone et al., 2000; Gasmi, Laffont, and Sharkey, 2000; Panzar, 2000; McElhinney, 2001; Chone et al., 2002).

McElhinney (2001) points out that privatisation and liberalisation of the telecommunications industry over the last 20 years had been championed to be able to drive down prices and improve service provisioning to consumers. He found, however, that the provision of universal service has become a policy contest between industry and the market to be serviced, due to differing motives and aims. It was also found that the methods used to fund and provide service under previous monopolies are not viable in the competitive environment due the elimination of the cross subsidy options previously utilised (Blackman, 1995; Chone et al., 2002).

Regulation of universal services has focused historically on the provision of basic telephony services. This is changing with technologies developing and operators

becoming able to offer different services quickly and cheaply (Frieden, 2000). Within the context of the regulatory frameworks, how the universal service obligation is allocated is a further challenge to regulators. Within the competitive environment, this obligation may be solely on the incumbent or, in the interests of productive efficiency, may also be allocated to the competitors and new entrants (Chone et al., 2002), possibly including operators providing converged services such as Voice over Internet Protocol (VoIP).

3.4.1 *Regulation and allocation*

The Capture theory developed by George Stigler argues that the regulatory agency is driven by the economic interests that it serves. This theory in principle states that the regulation of an industry can assist in the development of the industry as a whole through the utilisation of different economic regulation techniques. The theory recognises the competing demands placed on regulatory bodies from public and private interests in the markets. Other theories have also formulated models on the basis of different sources of influence. However, the levels of influence likely are dependent on the particular context. A study by Magat, Krupnick and Harrington, given as an example in Viscussi et al. (2005), found that the financial resources and the relation to the agency have much more influence than pure comments given on policy decisions.

Viscussi et al. (2005) further identified the main instruments by which the regulator would be able to exercise some control over the industry. The key decision variables are prices, quantity of products or services and the number of competing firms. Although not used as frequently, the regulator can also control variables such as product quality, advertising activity and investment made in the industry (Viscussi et al., 2005)

The content of the universal service policies and resultant Universal Service Obligations (USO) accordingly need to consider a number of elements which are

related to the instruments identified above. These include the funding mechanisms, technology scopes, competitive impacts, pricing conditions or constraints and coverage constraints, all of which will impact on the economic feasibility and long-term sustainability of the universal service policy (Blackman, 1995; Chone et al., 2000; Gasmi et al., 2000; Cremer et al., 2001; McElhinney, 2001; Chone et al., 2002; Hoernig and Valletti, 2002; Valletti and Hoernig, 2002; Hammond, 2005).

Table 1: Five stages of Universal Service Policy Development (adapted from Milne 1998)

Five stages of Universal Service Policy Development					
	Stage 1: Network Establishment	Stage 2: Wide Geographic Coverage	Stage 3: Mass Market Takeup	Stage 4: Network Completion	Stage 5: Service to individuals
Teledensity *	0 to 5 per 100	1 to 20 per 100	15 to 40 per 100	35 to 60 per 100	over 50 per 100
GDP per Capita Range	Low income	Lower middle income	Upper middle income	High income	High Income
Business Take-up	0-30%	20-80%	70-100%	100%	100%
Household Take-up	0-10%	5-30%	25-80%	75-100%	100%
Typical telephone company culture	Entrepreneurial	Administrative (govt. department)	Operational (huge workforce)	Commercial (maybe privatised)	Competitive
Typical Management Pre-occupations	Large scale capital investment in new technology	Technical network improvements, public service	Growing the demand	Growing call revenues (marketing)	Profitability
Main constraints to network expansion	Investment funds, appropriate technology and skills	Limited demand due to high prices (of low incomes) and use of alternative communications	Manpower for plant installation to meet mass demand (waiting lists)	Affordability of service to poorer households; cultural acceptability of telephony	Market appeal
Typical public policy measures (telecom)	Investment incentives	Govt. Control (fot nat'l security and economy); geographically uniform charges	Installation and rental charges kept low to stimulate line demand	Network competition, cost-orientated tariffs	Free, fair competition
Universal Service goal type	Technology (acquire new technology)	Geographic (maintain regional parity)	Economic (stimulate economy)	Social (achieve political cohesion)	Liberterian (individual right to communicate)
Examples of Universal Service goals	Long distance service linking all major centres; public phones where demand warrants	Telephone service available in all population areas; widespread adoption in business	Widespread residential takeup of telephony; meet all reasonable demands for telecoms	Telephone affordable to all; telephone service adaptable to special needs	Everyone can meet basic communication needs; public access to advanced services (esp. education, health)
Typical market research focus	Payphone rates and location	Main small business requirements	Main household requirements	Rural, disabled, low income needs	Needs created by new services (eg mobility, internet)
Typical public policy measures (universal service)	Licence conditions on network rollout	Profitable licences subject to unprofitable obligations	Control speed of price rebalancing	Targeted subsidies	Identify and meet non-market demand

* Teledensity is expressed in main line telephones per 100 population

The five stages proposed by Milne (1998), which are seen in Table 1, above, make it clear that the goals and obligations of universal service are different depending on the stage or combination of stages of development of the market. McElhinney (2001), for example, clearly places Australia, together with the USA, Europe and the UK, in the fifth stage, in which there is a highly technologically advanced infrastructure and high connectivity density to households. The objective of universal service then becomes to provide services to individuals and access to advanced services such as health and education via the provided communications infrastructure.

The universal service policies need to consider a balance of the different elements prior to allocating the USOs to the different operators. The pricing policies enforced could, for example, include uniform rates for basic services applicable to all operators, or price caps on some services based on the technologies and the demand. The state of the industry will determine how the pricing is regulated, as the policies may be different for a pure monopoly market versus one in which there are competitors who could benefit from regulating only a few of the parties (Viscussi et al., 2005).

Such price regulation may take the form of a range of prices rather than a single price. In the United States, for example, the Federal Communications Commission specified different long distance rates for AT&T (American Telephone and Telegraph) for different times of the day and week. This price structure makes the regulation of the environment more complex, however, and could limit the firms' profitability (Viscussi et al., 2005).

Policies such as these will have an impact on the revenues and profitability of the operators and, as such, on their ability and strategies to render the services (Valletti and Hoernig, 2002). Policy decisions and the costs related to them will also affect the coverage strategies of operators. Table 2, below, is adapted from Gonenc, Maher

and Nicoletti (2001) and gives an example some of the types of USOs imposed in different countries as at 1996.

Table 2: USO Requirements in the Telecommunications Industry, 1996 (adapted from Gonenc et al., 2001)

Universal Service Obligations requirements in the telecommunications industry, 1996	
Australia	Requires that standard telephone services, including services for the disabled, public payphones and prescribed carriage services, are reasonably accessible, independent of geographical location, on an equitable basis.
Canada	Requires that telephone services are provided to all who can pay for them, but customer access and usage charges are not required to be maintained at a uniform level across the country.
Finland	Dominant operator must serve all customers in their territory.
France	Obligation to provide quality telephone services at an affordable price.
Japan	Requires uniform and regulated charges for local calls and customer access.
New Zealand	The Kiwi Share Obligation on TCNZ: Mandates maintenance of the option of free local calls for residential customers, but tariff packages incorporating charges for local calls may be offered as an optional alternative. Prohibits real increase in residential customer access charges, subject to no "unreasonable impairment" of the overall profitability of the TCNZ's subsidiary regional operating companies. Requires the ordinary residential telephone service to be made as widely available as it was at 11 September 1990; and obliges TCNZ to maintain rural customer access charges at rates no higher than the standard residential rental. The Obligation does not extend to public payphones.
Sweden	Telia is obliged to provide telephone services between fixed points to all, regardless of where they live, at an affordable price.
United Kingdom	The USO requires: A connection to the fixed network able to support voice telephony and low speed data and fax transmission; The option of a more restricted service package at low cost; and Reasonable geographic access to public call boxes across the UK at affordable prices.
United States	Local Exchange Carriers (LECs) must average call prices for a given distance across their entire service areas, regardless of differences in costs. They must give customers in remote areas access to telecommunications services that are "reasonably" comparable to services provided in urban areas at charges which are "reasonably" comparable. Services must be provided at concessional rates to libraries, educational and health facilities and low-income customers. There is no legal requirement for LECs to install and maintain public payphones.

The above policy decisions accordingly impact on the competitive situation in the market place. While a common perception exists that competition will result in stifling the implementation of universal service, Mueller (cited in Barros and Seabra, 1999) found that the expansion of services actually increased more rapidly after the market

was liberalised. It was actually found that competition fostered the universal service of telecommunications rather than hindered it.

These issues all essentially drive the main tasks of a telecommunications regulator with regard to universal service to allocate and enforce the Universal Service obligations and to establish a means of funding these obligations (Chone et al., 2002). The literature suggests that, while the USOs previously were allocated to the incumbent monopolies, the challenge now is to determine how to allocate these obligations in a competitive environment between the incumbent and the new operators (Weller, 1999; Chone et al., 2000; 2002). Some of the different options which exist for regulators are:

- Licence conditions
    - The operators are obliged in terms of their operating licence to roll out a percentage of their network in defined Universal Service/access within a stipulated time period (Hodge, 2004).
- Pay-or-Play
    - The operators may choose to pay a percentage of profits to a Universal Service Fund which is then used to finance the USOs of incumbents and other operators, OR
    - The operator may choose to roll out universal services as part of their operation (Blackman, 1995; Chone et al., 2002).
- Auctions
    - The operators bid to execute the universal service roll-out and the lowest bidder (who determines the subsidy received) wins the project, which additionally enables the regulator to see the value/cost operators place on the universal service (Nett, 1998; Hodge, 2004).

The allocation of these obligations would also require a clear definition of the requirements of the obligations, be they quantity-, quality- or time-based. As Viscussi et al. (2005) point out, the regulator could specify the minimum quality of service which would be required. This. in turn. would affect the costs of delivery for those services and the affordability to the end user.

The second important aspect facing regulators for implementing the universal service policies is therefore that of funding. Funding of Universal Service obligations is a function of the above policy decisions. The policies and structures employed to achieve the goal of wide-reaching services and reduced cost of network access, is a hotly debated topic, especially when evaluating liberalisation and competition implications (Barros and Seabra, 1999; Gasmi et al., 2000; McElhinney, 2001; Hoernig and Valletti, 2002; Chhibber, 2004). The means of funding these Universal Service obligations and initiatives accordingly is a core component of the complete policy.

3.4.2 *Funding structures for Universal Service*

The regulation and funding of universal service provision take many different forms, including obligatory service provisions on all operators, universal service taxes and funds, cross subsidies between different segments of the market and specific initiatives or projects to grow universal access to Information and Communication Technologies (Barros and Seabra, 1999; Gasmi et al., 2000; Chhibber, 2004).

In order to determine the funding required for the Universal Service obligations, the costs, however, need to be known. Cremer et al. (2001) identify two primary means to evaluate and define the cost of a USO, which is composed of the profitability cost and the welfare costs of the USO. The primary difference between these costs is that the profitability cost measures the direct financial loss to the operator to implement the USO, while the welfare cost accounts for the total loss from an economic

perspective, when comparing an unaffected market to one which is influenced by the USO. As Viscussi et al. (2005) also highlight, the regulator, by setting prices, limits the profits of the company operating while the structure used for this price setting can, at the same time, result in incurring additional welfare costs in managing it.

Cremer et al. (2001) admit, however, that the means of measuring the costs in both cases have some faults due to the impact of the redistribution effects based on the mix of consumer. Panzar (2000) also points out that the true cost of a USO is dependent on the services bundle being offered. Panzar, like Cremer et al., (2001) found that calculating the cost of the USO accurately not only is an unsubsidised market scenario needed for comparison, but that the costs of serving the group of customers, as well as the foregone revenues due to the subsidy mechanism (redistribution effects), need to be considered together with the actual cost of the service provided.

A number of different models have been utilised for funding the universal services. According to Blackman (1995), the most popular model comprises the establishment of a Universal Service Fund. In this case, the competing operators contribute to the fund from their profits, and these funds are then used to compensate those that provide services to the lower profit markets defined within the realm of universal service. This is also called Access Deficit Charges (ADC). Alternate possible methods include pay-or-play, where the operators provide the services rather than contribute to the fund. Much of the literature identifies cross subsidies as a common tool for funding less profitable operations by utilising income from other areas (Blackman, 1995; Barros and Seabra, 1999; McElhinney, 2001; Hoernig and Valletti 2002; Valletti and Hoernig, 2002; Chhibber, 2004; Ramos, 2006).

Choné et al. (2002) classified the funding mechanisms into two primary types of funding systems, namely self-funding systems and externally funded systems. A self-funded system is financed by means of taxes levied on the consumers or by utilising cross-subsidies from more profitable areas. In contrast, externally funded systems are financed by means of taxes levied on taxpayers not directly associated with the

USO. The establishment of a Universal Service Fund, as described above, is a means of funding in which the operators contribute toward the fund, which is then utilised to compensate the incumbent or other operators who implement the universal service. A complementary option to such a fund would be for the operator to deliver the universal service rather than pay into the fund, should such an operator be able to provide the service at a lower cost (Blackman, 1995). This is the pay-or-play option identified in point 2.4.1 above.

Gonenc et al. (2001) investigated some of the funding mechanisms in place globally and found that, while interconnection fees provide another common means of funding USOs, not all countries have any funding mechanism in place at all. In some cases, the incumbents have to carry the full cost of the USOs, while in other countries the costs are shared between operators. The newly established Universal Service Provision Fund (USPF) in Nigeria has drawn on a number of different methods in order to finance its goals. The mandate of the fund includes the collection of allocations from government, fees from licences based on a portion of annual levies and gifts, loans, aid and other sources of funding for the USPF (Senge, 2006).

Table 3: Funding USOs, 1999 (adapted from Gonenc et al., 2001)

Universal Service Funding Mechanisms, 1999	
Australia	The costs of the USO must be shared among carriers so that no one carrier is disadvantaged. To this end, the costs of the USO are shared in proportion to carriers' shares of "eligible revenue". After obtaining the consent of participating carriers, the Minister may specify another cost-sharing mechanism.
Canada	Carriers are required to contribute to the USO requirement through a Portable Contribution Subsidy. The Subsidy is an explicit toll levied on all long-distance traffic carried on the local telephone network. The funds are distributed to all local carriers based on subsidy requirements per residential Network Access Services or equivalent by rate band.
Denmark	If it is proven that a deficit exists in the provision of universal service, the regulator will collect a contribution from fixed voice telephony service providers on the basis of turnover.
Finland	There is no specific universal scheme and as such universal service costs are not borne by other market participants. Incumbent must meet all universal service costs.
France	A national universal service fund was established in 1997. Net cost of overall geographic supply will be compensated by interconnection surcharges until 31 December 2000 at the latest.
Japan	Designated carriers must bare the cost of the USO's provision, which is funded by geographically uniform access charges and by long-distance charges. Funding of the USO was to be reviewed in 2000.
New Zealand	Kiwi Share Obligation is met by TCNZ through surcharges on its interconnection rates. Public disclosure of Kiwi Share costs are required from January 2000.

Norway	The incumbent operator bears USO costs based on its licence requirement.
Poland	Establishment of a USO fund is predicted in the draft of new telecommunication law.
Spain	Telefonica has been designated the dominant operator required to fund universal service until the end of 2005.
Sweden	There is no specific universal scheme and as such universal service costs are not borne by other market players. Incumbent must meet all universal service costs.
Switzerland	Universal service licence granted on a periodic basis by tender. If a need for funding is noted, the granting authorities (ComCom/OFCOM) can impose a fee on companies with a licence.
United Kingdom	BT is responsible for the provision of the universal service obligation but the cost of the obligation is not reimbursed.
United States	Each telecommunications carrier that provides interstate or intrastate telecommunications services must contribute, on an equitable and non-discriminatory basis, to the provision of universal service. Kingston Telecom is also responsible for the provision of universal service.
European Union	The European Commission permits, but does not require, the establishment of cost-sharing arrangements to finance USOs. It reports that nine Member States (from a total of 15) have decided either that the costs of the USO do not constitute an unfair burden on the provider or that the costs of establishing a fund are not justified. The rebalancing taking place in Europe, to the extent that it has reduced constraints on cost recovery, may have reduced the burden on incumbents.

It is therefore evident that a number of models and structures are available for funding universal service requirements and the model chosen needs to be carefully assessed prior to implementation. In Table 3, above, some of the globally utilised USO funding mechanisms presented in Gonenc et al.'s research are illustrated. Among the developed nations, a mix of universal service funds, cost equalisation and reimbursement, as well as sole obligation programmes, is utilised. In most cases, though, the funding of the USOs is undertaken in such a way that no unfair burden is placed on any one operator.

An alternative means of funding the cost of communications in the name of universal service would be to provide subsidies to those who should be served by the policies. While the taxation and other funding mechanisms would still be in place, rather than compensate operators for providing the services, the consumer would be financially empowered to buy the service at the applicable market rate. This would include subsidies toward social inclusion for consumers such as schools, rural populations and low income households (Gonenc et al., 2001; Chone et al., 2002; Hammond, 2005). The funding mechanisms are not mutually exclusive, however, and often

regulators will use a combination of plans or modified versions to best meet their needs (Intven et al., 2000).

A number of important criteria for funding mechanisms are identified in the Telecommunications Regulation Handbook available from the World Bank. The handbook points out that the mechanism must be economically efficient in minimising the cost of collection; administratively efficient; and sustainable in the long term in terms of lasting revenue streams, rather than once off collections. Lastly, the process should obviously be fair to all operators and not overly cumbersome for any one particular participant (Intven et al., 2000) .

3.4.3 *Conclusion*

In summary, the literature highlights a number of different challenges facing policy makers, both in terms of how to regulate universal service and how to fund it. Without regulation, there are risks that some users would be excluded from the market or, alternately, subjected to unreasonable tariffs. (Chone et al., 2002). Secondly, without a regulatory mechanism defining how the funding should be controlled, besides not having an incentive to deliver universal service, some operators would be disadvantaged under the new, competitive regimes through having to bear the full costs of providing universal service (Gonenc et al., 2001).

The literature therefore suggests that policies need to be in place for the regulation and funding of universal service. Policy makers, however, have to take into account the competitive situation, the market conditions and the stage of development of the telecommunications environment, as this will affect what needs to be delivered (Milne, 1998). The regulation and structuring of funding mechanisms need to be adapted to the requirements of the policy and goals to be implemented and the rules and allocation of the universal service obligations have to be decided with consideration of the goals of the policy. If the mechanism to implement the service is

not aligned with the policy, this disconnection will inhibit the successful realisation of the goals (Intven et al., 2000).

Research Question 2:

The literature on regulatory and funding aspects of Universal Services in telecommunications raises the second research question: Are the existing structures and processes put in place for the provision of Universal Services in South Africa suitable for the effective delivery of the services?

3.5 Challenges to the operators

The challenges to the network operators who are subjected to the universal service or universal access obligations, be they incumbents or new entrants, are largely dependent on the policies set out by the regulator. The flexibility of license conditions, the funding mechanism and the pricing and coverage constraints will impact on how the operator addresses the USOs (Chone et al., 2000; Gasmi et al., 2000; Cremer et al., 2001; Chone et al., 2002; Valletti and Hoernig, 2002; Oestmann, 2003; Hodge, 2004; Ramos, 2006). These factors will impact on the strategy the operators employ in order to meet their USO targets, but the physical implementation will also depend on the technology which they are allowed to utilise.

If the operator is restricted to certain conditions and technologies, the ability to roll out infrastructure into under-serviced or high cost areas is inhibited (Hodge, 2004). Oestmann (2003) found, for example, that the coverage of a mobile Global System for Mobile (GSM) base station can be extended from a theoretical limit of 35 km to a possible 70–120 km. While call capacity may be reduced, this could be a feasible and cost-effective solution in rural or low density areas. A requirement based on physical infrastructure quantities rather than population coverage would nullify such an alternative.

A more critical challenge to operators for the provision of universal service, however, is that of the pricing and cost impacts. The different regulatory aspects of the pricing and funding of universal service were discussed earlier. These could directly impact on the revenues and profits of the operators, depending on the regulatory regime, the competitive environment and the impact of regulatory requirements, and therefore become the central challenge to the operator (Blackman. 1995; Gasmi et al.. 2000; Cremer et al.. 2001; Gonenc et al.. 2001; Valletti and Hoernig, 2002; Ramos, 2006).

The regulatory requirements are usually aimed at providing services to a greater portion of the population, which includes those of low density areas and low income groups. As Peha (1999) and Blackman (1995) point out, these are groups which are often considered non-profitable due to the excessive cost of providing and managing the infrastructure and systems, with no possibility of realising economies of scale in the respective areas. However, even if these sections of the market may not be profitable, based on their own ARPUs, they will be able to receive calls from other areas, thereby generating revenues which previously would have been foregone. Blackman (1995) therefore also sees universal services as potential opportunities for the operators.

3.5.1 *Conclusion*

The amount of literature directly related to the challenges faced by network operators with regard to universal service was not found to be extensive. It was possible, though, to derive information about challenges from the related literature on the topic of universal service and how the different requirements need to be implemented, including their impacts on the various parties within the industry. Operators need to address universal service from a strategic viewpoint in order to account for all the different implications. While some aspects may appear to be purely cost-generating

obligations initially, longer term implications and possible benefits arise from comprehensively evaluating the impacts of universal service requirements. Each operator will have to deal with different challenges from universal service and how these are addressed will depend on the strategy of the operator.

Research Question 3:

What are the challenges facing network operators when providing services aligned to the universal service policies and targets?

3.6 Measuring Universal Service achievement

The goals of universal service have been defined broadly as providing a telephone in every home (teledensity-related) (Blackman, 1995) and affordable access to services (cost-related) (Mueller, 1997). As seen from the literature covered to this point, the definition of universal service, the goals of the regulatory bodies, the structures and the funding mechanisms used to implement the provision of services will all affect the measurement of the achievement of these goals.

The literature on actual measurement of the achievement of the goals is also not extensive. The measures that are utilised depend on the perspective from which the concept is approached. To measure the costs related to the implementation of universal service, a Hybrid Cost Proxy Model (Rosston and Wimmer, 2000), such as used by the Federal Communications Commission (FCC), could be utilised to determine the cost of supplying a line or focus on the cost of providing a particular service. Alternately, any of the other methods identified in section 2.4.2 could be used. The most common measure of service delivery, though, is penetration or teledensity statistics, which effectively define service as the availability of infrastructure (Gillett, 2000). The service being delivered needs to be measured in different ways, and therefore is dependent on the service type itself. As Gillett points

out, internet access, for example, is dependent on more than a telephone connection; it requires computers, software and other services to make it work.

How the statistics are reported, however, is also important as the true situation in rural areas may be hidden if the figures are aggregated into the overall national statistics, resulting in high growth in urban use concealing the stagnant picture in rural development (Shanmugavelan and Warnock, 2004). The measurement techniques for universal services, while largely target-driven and quantitative in nature, must therefore be adapted to the different services required and goals being investigated.

3.6.1 *Conclusion*

"Clear goals for universal access were not established during the first six years of USA's existence and affordability was associated with access rather than service, hence the agency missed its target of ensuring that teledensity increased by 20 percent" (Cole, in Mochiko, 2006a:1)

The quotation above is evidence to the fact that clear targets are required to ensure suitable measurement and enforcement. Therefore, while there is not much literature to consult on different methods to measure universal service, the correct alignment of measures to targets, as with any business or project activity, needs to be ensured. This measurement process therefore is a quantitative evaluation of the actual delivery statistics in relation to the targets set. The measurement and validation of these statistics is one of the aims of this research.

Research Question 4:

In relation to the implementation of universal service in South Africa, have the correct targets and executions against those targets been measured when evaluating the success of Universal Service and the USAASA in South Africa?

3.7 Conclusion of literature review

The literature review reveals a number of issues which need to be considered when defining and implementing a universal service policy. Consensus on the most effective means of either, however, is not obvious from the literature, as methods employed to define and implement the universal service policies depend on the specific situation in any particular country. The research questions derived from the different literature sources contribute to determining some solution to these particular challenges and factors, though, and by answering these questions, a consolidated set of conclusions may be reached, which could contribute to formulating an answer to the main research problem through delving deeper into the different impacting factors. The questions raised are reiterated below.

3.7.1 *Research Question 1:*

What are the goals which are to be achieved under the banner of universal service in South Africa in terms of the target markets and services which will be supplied?

3.7.2 *Research Question 2:*

Are the existing structures and processes put in place for the provision of Universal Services in South Africa suitable for the effective delivery of the services?

3.7.3 *Research Question 3:*

How are the different operators addressing the challenges of providing services aligned to the universal service policies and targets?

3.7.4 *Research Question 4:*

In relation to the implementation of universal service in South Africa, have the correct targets and executions against those targets been measured when evaluating the success of Universal Service and the USAASA in South Africa?

4 PRESENTATION OF RESULTS

4.1 Introduction

This chapter will present the results of the secondary and primary research conducted in this research. The results have been drawn from a combination of documentary analysis of regulatory documents, licences, reports and analysis of interviews conducted with identified respondents. The presentation of the findings is segmented into findings from documentary evidence and those topics identified from the respondent interviews. These topics have been generated through the analysis of responses to the broad questions utilised to guide the interviews. The interpretation of these findings in relation to the research questions is discussed and presented in Chapter 5.

4.2 Data sources and the interview sample

4.2.1 *Secondary data sources*

The secondary sources of data utilised were available within the public domain. These secondary sources included the Telecommunications Act of 1996 as amended (Department of Communications 1996), Electronic Communications Act (ECA) of 2005 (Department of Communications 2005), Network Operator Licenses and the Annual Reports of different institutions. Other research documents and press articles were also utilised to ensure that as much relevant information as possible was included in the secondary analysis. A complete list of these sources is included at the end of this report.

The secondary sources were analysed for the relevant information required for the report and these results are included and referenced below where applicable.

4.2.2 *Primary interview sample*

The primary interview sample consisted of expert individuals from organisations whom the researcher identified as being experts on the topics relevant to this research. The final research sample consisted of 12 respondents from all the areas involved in the implementation of services and projects in the telecommunications market. Respondents were identified in three categories:

- Network operators (fixed, mobile and data networks)
- Regulatory organisations (ICASA, USAASA)
- Supply side (consultancy, equipment and services, finance)

While the researcher attempted to contact all parties involved in the telecommunications industry in South Africa, it was not possible in all cases to obtain contact with respondents willing to be interviewed on the topic and, in some cases, the identified contacts were not available within the targeted time frames. Respondents from all relevant sectors of the industry have been consulted, however. The final list of respondents is presented in Appendix A.

The consolidation and theme-driven analysis has also enabled the researcher to honour the requests of some interviewees to not be directly quoted and identified with regard to some aspects of the research findings and responses.

4.3 Secondary research findings

The documentary analysis was focused primarily on documents relating to the regulatory environment and documents which report on the implementation of universal service in South Africa. While there is much press literature about the failure or perceived failure of some initiatives and the pressures facing them, these were not analysed in depth as they are essentially considered the source of the research topic and questions, rather than of the answers. The Telecommunications

Act of 1996 was repealed and replaced by the Electronic Communications Act of 2005. These two important documents were considered together, where applicable, and relevant changes in legislation were taken into account.

4.3.1 *First-tier organisations in South African telecommunications*

Within the South African telecommunications market, there are a number of different organisations with different roles and responsibilities who have influence over the topic analysed in this research report. Each of these organisations has a role to play in the provision of universal service in South Africa from every perspective. Their input and actions affect every aspect of universal service, from the definition of the needs and services, the funding of the projects and implementation of the targets, through to the ultimate measurement and success of the concept.

The primary organisations influencing the provision of services are:

- The Department of Communications
- The Independent Communications Authority of South Africa (ICASA)
- The Universal Service and Access Agency of South Africa (USAASA)
- The Universal Service and Access Fund (USAF)
- Fixed Network Operators - Telkom and Neotel
- Mobile Network Operators – Vodacom, MTN and Cell C
- Internet Service Providers and Value-added Network service providers

While Sentech and InfraCo will both play instrumental roles in the provision of supporting transmission capacity to all the operators and, possibly, broadband services to the public and government, their formal roles and responsibilities at the time of this research are under review and therefore are unclear. Their direct roles in

the provision of universal services to the broader population are accordingly also not clear and therefore are not considered in detail for the purposes of this study.

Regarding the organisations identified above, the mandates and responsibilities of the government organisations are defined in the legislation and through national strategic directives.

Table 4: Roles of South African regulatory bodies

Organisation	Role of the organisation
Department of Communications	"To create a favourable ICT environment that ensures South Africa has capacity to advance its socio-economic development goals, support the renewal of Africa and build a better world" (DoC Website).
Independent Communications Authority of South Africa (ICASA)	(a) To regulate broadcasting in the public interest and to ensure fairness and a diversity of views broadly representing South African society, as required by section 192 of the Constitution; (b) to regulate telecommunications in the public interest; and (c) to achieve the objective contemplated in the underlying statutes. (ICASA Act, Act No. 13 of 2000)
Universal Service and Access Agency of South Africa (USAASA)	• Advising the Minister on ways to bring about universal access and service, • Coordinating initiatives by service providers, and • Extending access to telecommunications by working with community-based organisations, non-governmental organisations, donor organisations and businesses. (Source: USA Impact Report 2005)

a. *The Department of Communications*

The Department of Communications (DoC) is the ministerial organisation responsible for the overall communications environment in South Africa. It is through the decisions enacted by the DoC that all other regulatory authorities and agencies are

established. The role of the DoC, as derived from legislation and National Strategic directive is:

> To create a favourable ICT environment that ensures South Africa has capacity to advance its socio-economic development goals, support the renewal of Africa and build a better world.
>
> (Department of Communications 2007)

Accordingly, the department is responsible for the overall development of policies and legislation to support this role, as well as the evaluation of the outcomes and impacts of the legislation which they introduce. This includes oversight over state enterprises and the country's national and international obligations and responsibilities as they affect Information and Communication Technology (ICT).

The mission of the DoC is quoted below:

> To enhance the well being of the people of South Africa, African Continent and the world through the creation of sustainable and enabling Information and Communication Technology environment. We shall through leveraging our world-class knowledge, skills and experience, deliver on our social contract to the people in a professional manner reflective of our national value system informed by the Batho Pele ethos,
>
> (Department of Communications, 2007)

The DoC is ultimately responsible for setting policy in the South African communications market, and this includes the policy for the provision of Universal Service. The recommendations for the direction and specifics of this policy, however, come from the bodies that are responsible for the implementation of the policy, being ICASA and USAASA.

b. *The Independent Communications Authority of South Africa (ICASA)*

The Independent Communications Authority of South Africa (ICASA) was established through the enactment of the ICASA Act No, 13 of 2000 (Department of Communications, 2000). This act consolidated the South African Telecommunications Regulatory Authority (SATRA) and the Independent Broadcasting Authority of South Africa (IBA). ICASA is therefore responsible for the regulation of the complete spectrum of communications, telecommunications and broadcasting, with the aim of accommodating the convergence of the technologies. The mandate of ICASA comes from a number of statutes, these being the Act, the Independent Broadcasting Authority Act (1993), the Broadcasting Act (1999) and the Telecommunications Act (1996). These acts have all been consolidated since, in the Electronic Communications Act of 2005 and the accordingly amended ICASA Act.

ICASA has the following key functions and responsibilities:

- Make regulations and policies to govern Telecommunications and Broadcasting
- Issue relevant communications licences
- Monitor and enforce compliance within the environment
- Decide on disputes brought against licence holders
- Manage the frequency spectrum
- Consumer protection within the communications environment

In terms of Universal Services and Access, ICASA's main role is that of the promotion of Universal Service and Access through implementing obligations to the licensees (Department of Communications, 2000). These would include roll-out requirements and contribution conditions for the Universal Service and Access Fund.

While ICASA will collect the funds for the USAF, it does not administer the fund as this falls within the responsibility of the Universal Service and Access Agency of South Africa (USAASA) (Department of Communications 1996, 2005).

Within its functions and mandates, ICASA is also responsible for the promotion of historically disadvantaged individuals in the communications industry and the protection of consumers. In terms of the ECA and ICASA Act as amended, the scope of ICASA's responsibility encompasses all mediums, including postal, broadcasting and satellite and not only telecommunications (Department of Communications, 2000: 2005) Accordingly, a key strategic goal of ICASA, highlighted in the 2007–2008 business plan, is the access to basic services, within which the development of the regulations to promote services and access to communications and postal services is a key theme (Independent Communications Authority of South Africa, 2006a).

In terms of Chapter 14 of the ECA, ICASA is also responsible for defining "under-serviced areas" and biannually updating these definitions. The definitions, however, are indicated in the Telecommunications Act and the ECA and are based on recommendations made by USAASA to the Minister of Communications (Department of Communications, 1996: 2005).

c. *The Universal Service and Access Agency of South Africa (USAASA)*

The Universal Service Agency (USA) was established through the Telecommunications Act of 1996 (Chapter 7). This agency was established initially to have a limited lifespan of five years, during which the promotion of universal service and access was expected to be completed. In Chapter 14 of the ECA of 2005, the existence of the USA was extended in the form of the Universal Service and Access

Agency of South Africa (USAASA). The basic mandate and responsibilities of the agency however remained the same (Department of Communications, 1996; 2005)

The functions of the USAASA in terms of the acts are:

- To promote the goal of universal access and universal service
- To encourage, facilitate and offer guidance in respect of any scheme to provide:
    - Universal Access or Universal Services; or –
    - Telecommunications services as part of reconstruction and development projects and programmes contemplated in section 3(a) of the RDP Fund Act, 1994 (Act No. 7 of 1994), where such provision will contribute to the attainment of the object of the project or programme in question; or
- Foster the adoption and use of new methods of attaining universal access and universal services
- Make recommendations to the minister to determine what constitutes;
    - Universal Access by all areas and communities in the Republic to electronic communications services and electronic communications network services; and
    - Universal provision for all persons in the Republic of electronic communication services and access to electronic communications networks including and elements or attributes of.
- Conduct research into and keep abreast of communication technologies, services and facilities
- Survey and evaluate the extent of universal service and access achievement
- Manage the Universal Service and Access Fund (USAF)

The agency structure is outlined below and consists of a number of departments for the different areas of responsibility. The agency is currently undergoing a reorganisation and restructuring programme. However, no details of the extent or impact of the changes are available.

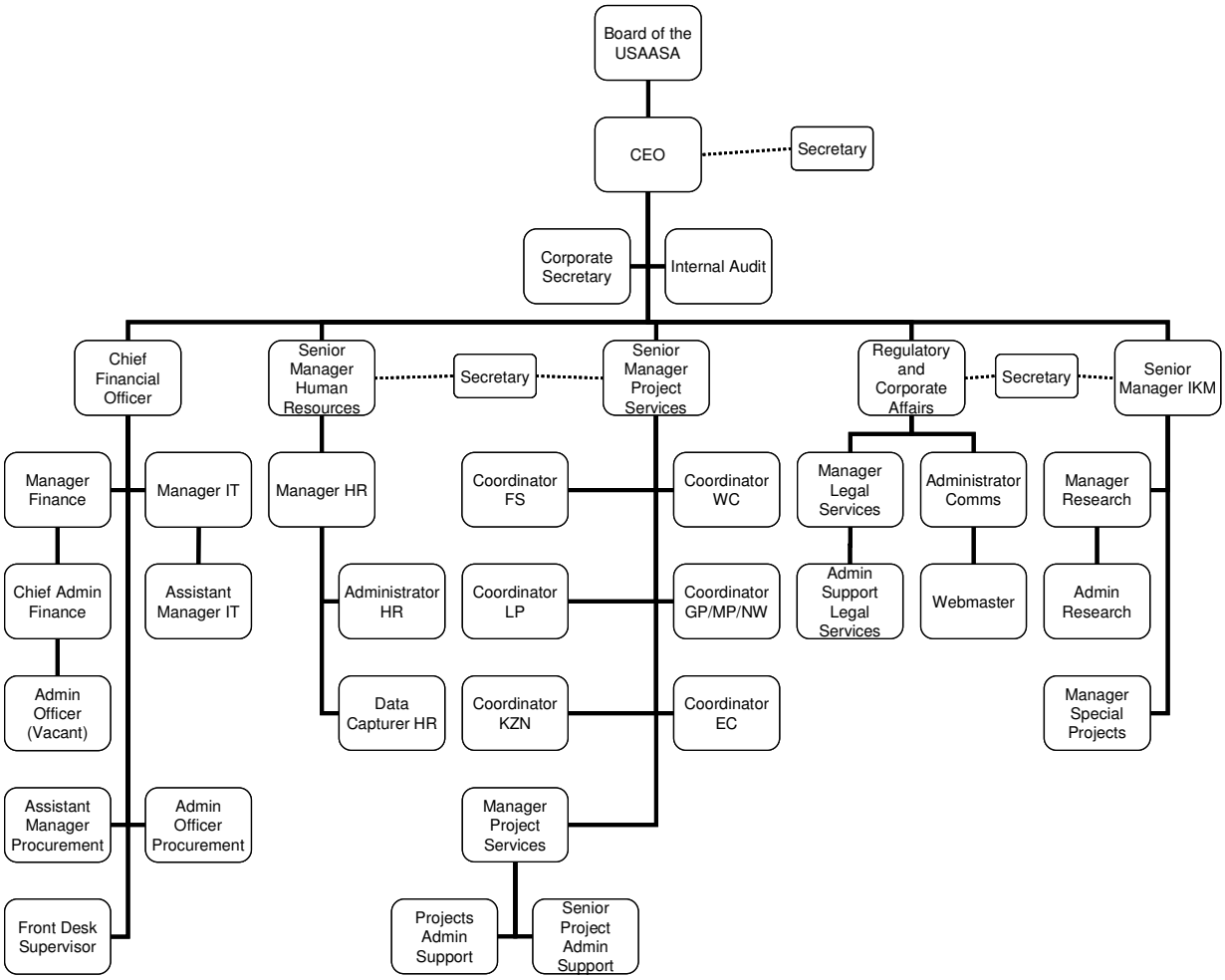


Figure 1: Organisation structure of USA/USAASA (USA, 2005)

The USAASA as a department within government, is funded by means of the national fiscus. The annual budget for the operations of the agency is managed separately from that of the USAF and is reported on and audited by the Auditor-General.

d. *The Universal Service and Access Fund (USAF)*

As in the case of the USAASA, the Universal Service and Access Fund (USAF) was established by the Telecommunications Act of 1996, and its lifespan was extended officially in the Electronic Communications Act of 2005. (Department of Communications, 1996; 2005)

In terms of the Public Finance Management Act (PFMA), the USAF forms part of the National Revenue Fund. The USAF was established in order to keep a separate account of the funds to be utilised for the provision of access and services in terms of the universal service objectives. The funds available in the USAF are sourced through contributions made by licence holders in terms of the licenses and directives issued by ICASA to the operators, as well as some smaller scale donations.

Contributions from the license holders form the major part of the amount paid into the fund. In terms of the Telecommunications Act, the contributions came primarily from the national network operators and the percentage was advised from time to time by ICASA. In terms of the acts, however, the percentage may not exceed 1% of the annual revenue of the licence holder. Historically, the contributions to the fund have been capped for different operators to a total of ZAR20–30 million and Value added network service providers (VANS) and private network operators paid normal fixed amounts of ZAR1500 and ZAR1000 respectively. This resulted in the USAF being under-funded initially in relation to its envisaged expenditure requirements (Universal Service Agency 2005).

The ECA extended this contribution and in terms of the most recent published notice, the contribution for all holders of licenses in terms of Chapter 3 of the ECA is 0.2% of their annual revenue. Only in the case of broadcasting licence holders does there appear to be an exception to this as these license holders may offset their obligation

against their contributions to their Media Development and Diversity Agency (MDDA) contributions, according to the ECA (Department of Communications, 2005).

While the USAF is a specific fund established for a specific purpose, the funds are ultimately paid over in terms of the PFMA to the national treasury. For the funds to be utilised, the USAASA needs to provide an annual budget to be approved by the treasury before funds are available. No details concerning the exact value of the fund were available in secondary data or from respondents. It is currently estimated that the retained value in the USAF could be as high as ZAR500 million. The 2005–2006 Annual Financial Statements of the USAF list total expenditure by the fund of ZAR 70 million and the balance remaining from their requested budget.

The contributions to the fund, as well as the annual licence fees, are paid by licence holders. An estimation of only the top three operators' annual contribution, which can be seen in Table 4, below, would in the 2005/2006 financial year far exceed the above utilised funds.

Table 5: Estimated USAF contributions FY 2006/7 for three largest national operators

Operator	Annual Revenue 2006	Est. USAF Contribution @ 0.2%
Telkom SA Ltd	ZAR33,000,000,000	ZAR66,000,000
Vodacom South Africa	ZAR25,000,000,000	ZAR50,000,000
MTN South Africa	ZAR21,000,000,000	ZAR42,000,000
Total	**ZAR79,000,000,000**	**ZAR178,000,000**

In the National Revenue Fund revised income estimate for 2006/7, it is estimated that the Universal Service Fund was to bring in R215 million for the year, which is feasible considering that the top three operators alone would contribute R178 million.

The 2005/6 contributions to the USAF are listed in the same report as being R142 million. By the end of the 2006/7 tax year, the fund could therefore exceed R500 million, taking into account prior year contributions of similar levels (National Treasury, 2007).

The funds that are contributed to the USAF are intended to be utilised for the promotion of services. According to the ECA, the types of subsidies which these can and should be used for are:

- Assistance of needy persons for the cost of provision to, or use by them of broadcasting and electronic communications services
- Financing of the service licensees for the purpose of constructing or extending networks into under-serviced areas
- Payment to public schools and other further training and education institutions for the procurement of and access to services
    - In this case schools must be in at least the lowest 3 quartiles for economic redress
    - Institutions must be registered with the state as Public benefit organisations and eligible for subsidies
    - Funding of centres (establishment and operations) where services may be accessed by the public (Department of Communications, 2005).

e. *Network operators and licence holders*

The different sectors of the industry have a number of different players offering services both to government and the private sector. These different types of operators have different levels of involvement in universal service and universal access depending on their licences and obligations.

The primary operators who are affected by and are able to affect the provision of services are:

- Telkom South Africa
- Vodacom South Africa
- Mobile Telecommunications Networks (MTN)
- Cell C
- Neotel

Other operators such as Value added Network Service licensees, ISPs, the carrier of carriers backhaul capacity supplier Sentech, and the yet to be fully licensed InfraCo, are also affected by the universal service goals and objectives. Their objectives differ from those of the primary operators since, at the time of this research, the VANS and ISPs were not permitted to self-provide infrastructure, while Sentech and InfraCo are still subject to the clarification of funding and licences in general.

The responsibilities of all of the operators are governed largely by the regulatory environment, since it defines the applicable obligations, contributions, criteria for execution and tariff structures. The organisational setup is dependent on the extent and complexity of the obligations and whether it can be managed through the normal roll-out channels and account management. This is therefore considered as of less importance in the context of the current research than the actual obligations and implementation effects. The obligations and other conditions will be discussed later on in the chapter.

4.3.2 *Definitions, goals and targets*

a. *Policy definitions and goals*

The definitions of universal access and universal service are the responsibility of the Universal Service and Access Agency in terms of both the Telecommunications Act and the ECA. While ICASA has the responsibility of providing recommendations for under-serviced areas to the minister, the definition would also have to be provided by USAASA. In the acts themselves, the definitions are left undefined and open to revision as and when deemed necessary by the minister.

The definitions to be applied to universal service and access have to be formalised through the Government Gazette, with bi-annual reviews by ICASA. Logically, under-serviced areas and the actual access and service definitions, goals and targets cannot be accurately established, enforced or measured without accurate descriptions to define needy persons.

In terms of the discussion paper on Universal Access and Service Definitions published in Government Gazette Vol. 400 No.19397 published in October 1998, the USA was mandated to develop the definitions. The USA published a draft document for comment in May 1999, (Universal Service Agency, 1999), which outlined their for the above definitions. Pursuant to these proposed definitions, no formally accepted version of the document or subsequent draft documents could be found on the government notice portal or sourced from USAASA. The proposals as per that document are listed in Table 6, below.

Table 6: US and UA definitions and proposals

Proposal Item	Description	Targets/Proposal
Right to access a telephone for emergency calls		Access to and calls for emergency services should be free of charge and available to all.
Basic telephony Short-term target		By 2000: Main Target: 1 telephone within 2 km of all population Minimum target : 1 telephone per village (3204 villages in SA)
Basic telephony Medium-term target		By 2004: Working telephone within: - 1 km in rural area - 200 in non-rural areas
Quality standards		CST availability Class A – 24/7 Class B – 12/7 95% uptime and fault repairs within 1 week of reporting
Cellular coverage		By 2001: all operators cover all territory of the Republic
Tele-centre type services		All communities to have access to tele-centre type services by 2004.
Under-serviced areas		Basic definition of less than 10% penetration
Accessibility of telephone cards		Incumbent must make card phones available
Accessibility of community phones		Availability of CSTs 24/7
Obligations of operators		All operators should have quantified and measurable targets for CSOs and USF contributions
People with disabilities		Principle concepts outlined: • Compatibility of telephones with hearing aids • Development of text phones

		• Subsidisation of text and specialist phones to improve cost effectiveness • Unrestricted text user help scheme
UA and women		No specific targets except on tele-centre ownership. Need to involve women is included
Directory and emergency services free	The provision of basic voice telephone, including access to directory and emergency services, at an affordable price to households who request it regardless of where they live.	No specific target applicable
Special provisions for the disabled	Measures to be taken to cater for people with special needs or disability in the provision of telephone services. Currently only basic telephone services qualify as Universal Service as they are regarded as essential for full participation in most of the developing countries.	No specific target applicable
Value-added services	Additional services such as directory enquiries, information amount services and prices, itemised billing, call barring and malicious call control services.	No specific targets defined. These services are considered necessary to assist the customer in avoiding high telephone bills and undesirable calls and fully utilising the service.
Criteria for Universal Service provision	Availability	Nationwide coverage of telephone services wherever and whenever required. By 2004, all households should have a telephone point/plug fitted.
	Accessibility	There should be no discrimination in the provisioning of telephone services. Services and gadgets must be available to cater for disabilities, such as: • compatibility with hearing aids • videotext phones for the profoundly deaf • Text phones • Short access dialling codes for text users for emergency calls • All customer information available in Braille/large print and on tape including bills, correspondence

	Affordability	Services should be priced so that most users can afford it and most users are kept on the network permanently.
Community-owned telecommunica-tions co-operatives	Community co-operatives established to provide households with access to telephones – Universal Service	Pilot projects were to be established but no details were specified.
Reduced entrance barriers	Access to services through Telkom is subject to installation, purchase and rental costs	As core infrastructure roll-out is primary cost, installation costs for a new subscriber should be free of charge from both incumbents and other operators.
Lifelong connection to the PSTN Network	Every connected subscriber, even if not making calls, does generate revenue for the operator through receiving calls within the network and other networks through interconnection fees.	No user should ever be disconnected from the network, at worst, blocked from making calls. Tiered levels of service, pre-paid options, low-cost schemes and flexible billing should be introduced.
Tariff affordability	Flat rates for local calls	A flat rate should be charged for an unlimited quantity/duration of local calls. National and international calls would be separately charged.
	Wholesale tariffs for SMMEs	SMMEs should be charged lower tariffs for services which will benefit the communities they serve, thereby promoting universal access.
Reporting of performance	Measurement of the achievement of obligations is dependent on feedback from operators.	Operators must be obliged in terms of their licence to furnish reports on performance against their CSOs.
		A Universal Service committee consisting of representation from USA, SATRA (ICASA) and operators should be formed to review progress and challenges.

Source: Universal Access and Universal Service Discussion Paper (Universal Service Agency, 1999)

Besides these formal definition proposals, alternative and conflicting definitions for some of the areas can be found in other documents dealing with the implementation of universal service.

In the Cell C national cellular licence for example, the definition of an under-serviced area was that 10% of inhabitants had no access to public switched telephone service exchange lines. In the Vodacom and MTN licenses, however, nothing was clearly specified. The Carrier of Carriers license issued to Sentech does, however, include a definition of 5% teledensity. Importantly, the Under-serviced Area licensees have the definition of an under-serviced area as being one with a teledensity of less than 5% in their licences as well. (Independent Communications Authority of South Africa, 2001: 2003; 2004a; 2004b; 2004c)

Besides the draft document issued, no further formalised definitions are available either from the Universal Services and Access Agency or from within the public domain. In 2001, a policy directive addressing the issue of the digital divide was issued by the minister. This notice required that the universal access definitions be redefined to include advanced services such as internet services. It further required that the needs of differently abled persons and geographical dispersion be taken into account in the definitions and the targets. The USA impact report notes, though, that no mention was made of the cost of services (Universal Service Agency, 2005).

The Universal Service Agency Impact Report commissioned by USAASA in July 2005 additionally found that there were no formal definitions for Universal Service or Universal Access completed. The feedback from agency representatives during the interviews conducted for the current research was that the definitions are being worked on and will be available in 2008.

b. *USAASA goals / targets*

In addition to the definitions and proposals on the needs for universal services, the USAASA has additionally been tasked by the Department of Communications with high level targets and has undertaken a number of implementation projects and initiatives for which their own specific goals have been defined. These

implementation projects, started in 1998, are listed in Table 6, below. The projects were not officially listed as within the mandate or direct responsibility of the USA/USAASA.

Table 7: Universal Service agency projects

Project	Description & aim	Target & date	Achievement milestones
Telecentres	Electronic communication access points providing: • Voice • Data (word processing, fax, internet and email) • Video (DVD & CD-ROM) • Printing & photocopying facilities • ICT Training	60 in 1998 100 in 1999 4000 in total Revised target of 500 by 2002	1 in FY 97–98 18 by FY 98–99 65 by 2 000 81 by 2001 111 by 2005 Further 50 were deployed in FY 2005/6
Cyberlabs	School internet laboratories with 30 workstations, 1 server and printer. Target schools in previously disadvantaged areas.	1000 by 2005	21 in 2002/2003 191 in operation by 2005 Additional 148 deployed in FY 2005/6
Community digital hubs	Support ICT facilities in rural & urban renewal nodal points: • Build capacity in areas for full utilisation of ICTs • Empower communities with ICT to improve quality of life • Develop opportunities for communities to utilise ICTs • Develop buy-in on	Pilot projects to be established in 2005/2006	3 Pilot sites completed, 2 active in 2005/6, 1 to be deployed in 06/07

	importance of ICT from local and provincial governments • Test and evaluate latest technologies to assist communities in socio-economic development		
USAL subsidies	Subsidies for roll-out of infrastructure for under-serviced licensees	27 USAL licences in total	7 USALs licensed in 2004/2005 now to be replaced by PUSANO

Source: Universal Service Agency Impact Report – July 2005 and USAASA Annual Report for Fiscal Year 2005-2006 (Universal Service Agency, 2005; 2006)

The strategic plan of the USA for 2005–2008 has subsequently set the following targets for the different projects:

Table 8: Universal Service Agency strategic plan targets 2005–2008

Project	Target 2005–6	Target 2006–7	Target 2007–8
Digital hubs	3	8	10
Telecentres	86	38	24
Cyberlabs	40	31	20
Gateway sites	18	18	18
USAL subsidy	7	14	21
Sites on VPN	200	250	357

Source: Universal Service Agency Impact Report (Universal Service Agency, 2005)

In addition to the projects, the USA also undertook flagship programmes aimed at empowering and developing communities and individuals in ICT usage and the upliftment of previously disadvantaged communities in the industry. These

programmes as per their 2005/6 Annual Report (Universal Service Agency, 2006) were:

- Bridging the Digital Divide
    - Contribute to skills development of learners through e-school Cyberlabs and Community Telecentres
- The Incubator Programme
    - Develop and uplift ICT companies, particularly those owned by women
- Teachers' E-Readiness Training Programme
    - Education and Training of teachers
- The Intern Program
    - Skills development initiative for young people in the ICT Sector
- The Telecentre Association of South Africa (TASA)
    - Aim to empower communities to own and operate sustainable telecentres.

The above projects, targets and initiatives are those established and operated by the Universal Service Agency. Since the renaming of the organisation to the Universal Service and Access Agency in late 2005, no new targets have been set and other information could not be accessed. The 2006–2007 annual reports of the DoC, USAASA and ICASA, which would have provided additional information, are also not yet available from the official government websites or the departmental websites themselves. In addition, the agency website has been under construction since July/August 2007.

According to the 2003 Budget speech from the Minister, the Department of Communications set a USA target of increasing the teledensity in South Africa from 10% to 20% by 2005/6. The Universal Service Agency Impact Report indicates that this would have equated to having 4,844 million connections installed within three years (Universal Service Agency, 2005). This target was never met and it can be considered unrealistic, since it would have required a doubling of the total connections within the period and would obviously have required the full co-operation of Telkom in conjunction with the Telkom obligations.

c. *Network operator targets / obligations*

The telecommunications licences issued by ICASA to the network operators in South Africa contain Community Service Obligations (CSO) which are imposed on the operators. These CSOs, also commonly referred to as Universal Service Obligations (USOs), were linked to the spectrum and frequencies which the operators were allowed to utilise for operating their networks. Obligations have been imposed on all the national operators, both fixed network and mobile networks, as well as on some of the smaller Value Added Network Service (VANS) providers and other data network operators. The obligations imposed on the primary operators are listed in Table 9, below.

Table 9: Universal Service Obligations for network operators

Operator	Licence Type	USO	Achievement
Telkom	PSTS, VANS	3 million fixed lines of which 1.796 million must be in under-serviced areas within 5-year exclusivity period	Lines implemented, but it is estimated that 60% removed due to defaulting customers
Vodacom	900Mhz GSM 2G	22000 Community Service Telephones within 5 years from start of operations	Completed
	1800 MHz GSM 2.5G	2,5 million Sim Cards & 125 000 Handsets to under-serviced	Not yet started

		communities	
	3G/UMTS	Internet access to 140 institutions for people with disabilities in 3 years	
		Internet access to 5000 public schools in 8 years	50 Gauteng Completed 49 NW awaiting ICASA approval of roll-out plan 135 KZN Roll=out plan still to be agreed
		1400 terminal equipment in 3 years to above institutions as a donation with no obligation to upgrade/maintain	
MTN	900Mhz GSM 2G	7500 community service telephones in 5 years from start of operations	Completed
	1800Mhz GSM 2.5G	2,5 Million sim cards & 125 000 handsets to under-serviced communities	Not yet started
	3G/UMTS	Internet access to 140 Institutions for people with disabilities in 3 years	
		Internet access to 5000 public schools in 8 years	45 Schools
		1400 terminal equipment in 3 years to above institutions as a donation with no obligation to upgrade/maintain	
Cell C	900Mhz 2G	52000 community service telephones within 7 years of start of operations	Completed and exceeded
	General	Commitment to spend R1 billion over 10 years on Joint Economic Development Programme	
Neotel		Provide and maintain high speed (256Kbps) internet connectivity at • 2500 schools or further training institutions	Neotel only started offering initial services in mid-late 2007

		• 2500 rural clinics	
Sentech	Multimedia licence	500 school internet laboratories within 5 years from effective date	n/a
		** Sentech requested this be removed from the licence	n/a

Source: Independent Communications Authority of South Africa 1997; 2001; 2003;, 2004a; 2004b; 2004c; 2006b

The above obligations have been achieved with varying degrees of success due to a variety of reasons. In the case of the mobile operators, the original CST obligations have been completely rolled out and have in some cases even exceeded the requirements. Cell C which had the largest obligation for CSTs, has continued to implement the phones as they are proving to be economically profitable.

The Telkom obligation to roll out lines was completed prior to the expiration of the exclusivity period. While detailed numbers are not available, the industry feedback and the USA Impact report estimate that between 60% and 75% of the lines implemented in under-serviced areas have since been disconnected.

4.4 Primary Research Findings analysis

The interviews conducted with the identified respondents in the industry facilitated a number of findings. Some of the information supporting these findings was common knowledge for all of the different respondents while some information was unique to one or a few. The findings are presented below, aligned with the main areas of questioning which guided the interviews. These findings are collated and analysed, together with the secondary research and literature reviews, in Section 5.

4.4.1 *Service definitions, needs and targets*

The questions dealing with definitions, needs and targets were aimed at establishing respondents' perspectives on the current, formalised definitions and targets and at determining what they perceived to be the needs in the South African market place. The findings of this section are related to research question one concerning the goals of Universal Service in South Africa.

The findings can be classified into a number of different sub-topics covering the market, the definitions, the process required and the overall needs which must be considered when implementing a universal service policy in South Africa. These sub-topics are:

a. *Definitions of Universal Access and service*

According to the respondents, the process of defining what universal service and access should represent was not complete. The process of establishing the definitions has been in process since 1996 but finalisation has not been achieved. The definitions are required, though, to enable the clear establishment of targets and needs, otherwise measuring the achievement or delivery would be problematic, as different participants would understand the concepts differently. The definitions have to take into account:

- Where service must be defined ("under-serviced areas")
- Who services should be provided to ("needy peoples")
- What the provision and utilisation of the services would cost (affordability criteria)

Furthermore, it was highlighted by Respondent 9 that the definitions and where they are applied should be dealt with on a rolling basis. This is required to ensure that the

status of under-serviced or needy will change as areas and people are uplifted. Revising the classification out of the under-serviced group would make it possible to, redeploy the funds and support that are supplied to other under-serviced areas to start the process again. Two respondents similarly suggested that the prioritisation of the defined groups should be clearly conducted. As with a rolling definition target, this would enable the funds and support of certain areas or groups to be applied, where they were most needed.

b. *Socio-economic needs*

Different aspects of the economic needs and targets of universal service and access were highlighted by the respondents. Five respondents mentioned the fact that there are established first- and informal second-level economies in South Africa which have different needs which need to be addressed. The first economy is established and demand for services is driven by the market. Within this economy, the types of services required are more advanced and are not as affected from an affordability perspective. The second economy primarily comprises a developing/informal market and the demands are different with regard to both service types and affordability.

Respondents 3, 7, 8 and 10 also highlighted that the needs should take into consideration the purpose which is to be achieved from the services being provided and the ability of the community to utilise those services. These may be basic communication, educational tools or programmes, upliftment of the community or development of the local economy in the area. Respondent 9 also noted that projects which are rolled out to these areas need to include more than just government services in order to make them viable and attractive. Inclusion of private enterprises in the community centres would, for example, provide a base to support the centre beyond just the telecommunications services being provided.

An overriding response from the majority of the respondents was that the cost of services is a factor which needs to be addressed in defining the targets and the needs. The issue of affordability will not affect the roll-out of the services only, but also the actual utilisation and long-term sustainability. If the services were not affordable, those services would still not be truly available to the defined needy people who by and large are from the lower income brackets.

c. *Technological needs*

The need for a voice and data bundle of services to be provided was identified from a technological perspective by five of the respondents. Other respondents had reservations about whether data were required in all cases, as these needs are dependent on socio-economic need and the ability of the target market to utilise the services effectively. The majority of respondents, however, agreed that the introduction of mobile technology has changed the technical landscape of service provisioning significantly.

Respondent 2 argued that, due to the technological advancements and the constantly changing environment, specific targets could not be set as the environment is too dynamic. Changes due to technology were also identified by Respondents 4, 7 and 9 as a major factor affecting the definitions, particularly those covering access and teledensity. The teledensity targets were seen as fixed line communication technology-related, while population coverage was seen as of greater relevance in the mobile technologies. Currently, teledensity in South Africa is estimated at approximately 11%, while mobile phone coverage is in the region of 90-95% (Respondents 2, 7).

The need for all persons to have access to voice telephony was not questioned and, from the perspective of Respondent 7, is not a point of debate, especially with such high coverage rates. To shift the access focus to provide data services would,

according to Respondent 7, make more sense. The need to “Bridge the Digital Divide”, which is the overarching aim of the government, was also mentioned by Respondents 5 and 6 as a specific need. This would take into account the provision of data and voice services.

As mentioned under the socio-economic points above, the intended use of the technology and services that should be provided would drive the implementation process. According to Respondent 1, the services that can be provided are also, dependent on which technologies are in place. Respondent 2 identified the need to know what the technology could do, when defining a target for the services to be provided.

d. *Skills development*

The need for the development of skills related to the provision of technological services was highlighted by all respondents in one way or another. The need for skills development cover a range of aspects, from basic literacy through to technical and business skills required to run the different community infrastructure initiatives.

The respondents identified the following as required skills:

- Literacy
- PC Literacy
- Maintenance skills for technology infrastructure
- Business skills for community projects
- Training of teachers to enable training of students in schools

The skills development needs were highlighted by the respondents as a prerequisite for making the provision of the services meaningful and successful in the long term.

Respondent 7 described this situation as the internet having shifted the focus from a have and have-not scenario to that of have-not and cannot use, due to the lack of skills. In this aspect, Respondent 8 highlighted point that services that are provided need to support the underlying need. As voice services are relatively simply and can support the direct well-being of the individual, such as contact with others, access to emergency services and assisting in finding a job, they can be widely utilised. While data services can assist in expediting educational needs, the basic skills need to be in place first.

The skills and knowledge aspects also were highlighted as of crucial importance in the business aspect. In the cast of community service phones, community centres and the USALs, the business and technical skills required to run the operations successfully are central to sustainability. Respondents 4 and 11 identified these skills as criteria to be evaluated when determining the possibility of financing a small operation such as a USAL. When asked about the USAL concept for achieving universal service, other respondents also highlighted the lack of necessary skills and experience as one of the shortcomings in the majority of the different USAL operations.

4.4.2 *Effectiveness of structures*

Respondents were asked to comment on the effectiveness and efficiency of the current structures and programmes which are in place to drive the provision of universal access and services. The structures and programmes referred to included but were not limited to the ICASA, USAASA, the USAF, the initiatives being run by

USAASA such as the Community Telecentres, and E-School Cyberlabs, as well as the Universal Service Obligations (USO) that have been imposed on operators. The questioning of respondents that has been discussed here relates to the second research question covering the effectiveness of the structures for providing services.

The respondents noted a number of common factors concerning the effectiveness of the current structures which are in place. According to the respondents, these factors in total have resulted in a lack of effective actions being taken in the provision of services. The factors that were identified are:

a. ***The lack of a common and cohesive approach***

Seven respondents specifically noted that the approach to the provision of services from an overall perspective lacked a cohesive view or focus. This lack of focus results in a lack of direction for the Universal Service and Access agency and for others involved in the provision of services.

Respondents 6 and 9 were of the opinion that the regulatory environment does not take the industry opinions and recommendations into account when developing policy and Respondent 8 similarly noted that a challenge to the regulatory perspective is that the topics are evaluated from a public perspective, without adequate consideration of the companies involved. Respondent 9 also noted that there is a certain amount of ministerial interference in the process, which results in further inconsistencies and problems in moving forward.

b. ***Regulatory effectiveness***

Closely related to the lack of a focused approach was the respondents' view that the regulatory bodies themselves are not supportive of the provision of services, from a practical perspective. Issues identified by respondents included:

- Slow decision making by the regulator, for instance concerning the approval of to whom obligation-based sim cards and phones should be allocated;
- Incomplete regulation such as related to the structuring of the e-rate cross regulation for discounts to schools with regard to internet connectivity;
- Bottlenecks in providing guidance and rulings in general;
- Delays in the regulatory decisions that have a detrimental effect on the business plans of some operators, for instance the USALs.

Besides these practical issues, the respondents also noted issues regarding the roles played by the different regulatory bodies. The USAASA who should, for example, manage the funds and implementations (respondents 7, 9 and 10) instead is performing the implementations. Additionally, the allocated funds need to be justified from the treasury and this does not always work efficiently in their favour. While the agency is responsible for the Universal Service Fund, it was found that the actual value of the fund was not known to the agency, but could only be estimated at around R500 million (respondents 2, 4 and 9). A further concern, raised initially by Respondent 10, was that the projects being rolled out by the USAASA, while currently aimed at uneconomically viable areas, may ultimately become viable and therefore competitive for the current operators who have paid into the USAF, which, in turn, paid for the initiative. This effectively would mean that the operators financed their own competitors, which is accordingly illogical.

c. *Lack of / incorrect resources in organisations concerned*

The above issues concerning the regulatory and the implementation side were identified by all respondents from both the regulatory and industry sides as resulting from a lack of skills. While there are skilled resources in all the organisations, respondents felt that the skills in place were not correct for the tasks assigned to them. Respondent 8 also voiced the view that there is a general problem regarding resources, in addition to the competency problem, in both ICASA and USAASA. This resource problem exists in terms of people and also concerns the funding that the organisations receive and, in turn, affects implementation of their tasks, as well as the resources and skills they can secure.

Respondent 3 also indicated the lack of knowledge and infrastructure in the USAASA as part of the reason for the problems that are faced. Respondent 2 identified a lack of technical skills in the USAASA, as well as in the basics for planning and costing of the projects, which prevents proper assessment of the solutions that are proposed. Respondent 10 did point out, though, that the USAASA has gone through a number of metamorphoses. In support of this, the respondents from USAASA admitted that the organisation is currently being reorganised and the correct skills are being developed and sourced in line with their mandate.

Further to the skills challenge faced by the organisations, respondents also identified a lack of requisite skills on the ground with the projects as an inhibiting factor. Respondents 4, 5 and 8 pointed out that adequate education and training for Universal Services initiatives are crucial to ensuring their success. This especially referred to ground-level skills to manage the projects once they are implemented. The required skills include basic business skills, technical skills and the ability to utilise the resources that are made available, and extend to skills required for the management and ownership of the assets, as well as the development of the processes and guidelines to control post implementation continuation of the projects.

d. *Implementation challenges*

When asked to comment on the effectiveness of the current projects and initiatives being implemented, the respondents presented a number of different views concerning the successes and influencing factors. Respondent 8 stated that the Community Service Telephones were by far the most effective programme of all thus far, with the total roll-out estimated to exceed 200 000 phones, which is far above the original commitments. All the other programmes pale in comparison with this. Respondent 10 was of the opinion that the Telkom roll-out failed as it did not take account of the affordability of the connection, only for the actual infrastructure deployment.

The other projects implemented by the USAASA where carried out due to a lack of action of other parties who were responsible for providing services (Respondent 4). These programmes faced challenges resulting from the above-mentioned lack of skills. Similarly, the possibility that projects would ultimately be perceived as competition, as highlighted by Respondent 10, stood in the way of getting the support of the industry. Besides the regulatory and skills issues, though, the utilisation of the funding mechanisms was considered to be a major inhibiting factor in the implementation of projects (respondents 2, 5, 8, 9,and 10).

While the concept of the funding of the Universal Service and Access Fund is considered suitable, the actual implementation and utilisation of the funds therein is not efficient. Firstly, as the funds are paid into the government National Revenue Fund, ICASA and the USAASA have no clear indication of the total amount that is available (Respondent 9). Secondly, the prescribed process for the USAASA to access the funds requires the agency to justify and expropriate the funds from the treasury department (respondents 9 and 10). This process results in infighting for funding between government, the authority and the agency. Ultimately, respondent 10 explained, the agency needs to demonstrate value to get funds, but needs the funds to demonstrate the value.

The Universal Service and Access Fund, which is funded by means of a 0.2% contribution based on revenue from each licence holder, is structured along the lines of a Pay-and-Play model (Respondent 9). It is seen as pay-and-play as the operators who contribute to the fund still need to implement USOs in addition to their contributions. While the funds in the USAF are utilised to support US and UA projects, these are not directly to the benefit of the operators. The USAF should be used towards improving the affordability of the service offerings, including internet, voice and infrastructure (respondents 8 and 9).

e. *Under-Serviced Area Licences*

The Under-Serviced Area Licence (USAL) initiative demonstrated many of the above challenges in the implementation of the concept. The USAL licensees required a large amount of regulatory support in order to get themselves established and to be competitive (respondents 4, 7 and 9). Factors which have affected the implementation of the concept have involved the delay of the decisions by the regulator and Minister for granting of licences, the protection or lack thereof from competition in the designated areas and the method and conditions applied to the allocation of the funding. The skills required to set up and operate a telecommunications operation were also highlighted by Respondents 4, 5, 8 and 11 as lacking in those who have applied for the licences.

The need for a scale of operations and a quick roll-out plan was also identified by respondents 3, 5, 6 and 11 as central to being competitive. The opening up of the regulatory environment through the introduction of the ECA also contributed to the USAL operators not being afforded protection from other players such as VANS, whose competition was not planned at the time of announcing the USAL concept. At the same time, the USALs provide an example of how the USAF contributions from the large operators are indirectly funding a competitor to the national operators. This situation would be exacerbated even further should the conversion of the USALs to

Provincial Under-serviced Network Operators (PUSANO) go ahead successfully (respondents 3, 4, 6, 7, 9).

In summary, the current structures and programmes are facing a number of issues which hamper their effectiveness. Respondent 3 summarised it well as “There is a passion for service delivery, but a lack of logistical skills to get it done”.

4.4.3 *Operator challenges*

All respondents were posed questions on what the challenges to the network operators themselves are with regard to providing universal service. The challenges that were faced were focused on implementing the obligations in terms of the licences and other requirements such as the contributions to the USAF.

a. *Universal/Community Service Obligations*

The USOs imposed on the national network operators were initially set when the licences were granted in terms of the Telecommunications Act of 1996. With the exception of the Telkom obligations, which were restricted to the exclusivity period, these obligations have been added to, particularly for the mobile operators when new requests and extensions to the licences were made.

The fact that obligations in general constitute a grudge implementation and a bind on the operators was raised by respondents 5, 7 and 10. The other respondents did not disagree on this point, however respondents 4, 7, 8 and 9 also agreed that the obligations are not detrimental to the operators and can actually be beneficial and profitable, if run on economic principles. An issue concerning the obligations that was raised, however, was that the obligations were set in the past and have not actively been reviewed for their feasibility or applicability with moving forward.

This is especially relevant, as pointed out by respondents 8 and 9, with regard to the 1800 MHz obligations to supply sim cards and phones to needy people. While the defined people have not been identified by the regulator and the obligation has not even come into force, its feasibility when considering the changes in the market and environment since the obligations were put in place is debatable. Respondent 8 gave the example that, based on the envisaged call rates at the time of the imposition of the obligation, some operators could under-cut that rate now, due to changes in the market and industry. Therefore, how applicable the obligation really is and whether the technology put aside at the time still is what is required can be queried.

In general, all the respondents agreed that the obligations in themselves were not a major challenge to the operators. They are able to roll-out, and have exceeded, the requirements in all cases where the regulatory environment has kept pace with the operators' requirements.

b. *Regulatory challenges*

As described by the respondents in the section on effectiveness above, challenges to the operators arise from the pace of the regulatory decision-making processes. As the roll-out of obligations imposed on all operators is dependent on approval by the regulator, the operators cannot meet the targets and provide services if the regulator does not provide guidance in good time.

A perfect example of this, provided by the mobile operators, relates to the 1800 MHz spectrum obligation for Vodacom and MTN and further to the 3G licence obligations. As ICASA needs to approve the target market for the provision of free sim cards and phones, this obligation cannot be met until ICASA has played its part. In the case of this obligation, no clear guidance has yet been provided by ICASA. The obligations have therefore not even been attended to. The connectivity of defined schools to the

internet in terms of the 3G data licences presents a similar case. It also requires the schools to be approved by ICASA. The delays in this process, for example, has resulted in only 45 of the required 1500 schools which MTN needs to connect, having been being connected. Vodacom, similarly, has only been able to proceed with connection of fewer than 200 schools and clinics.

Respondents 4, 7, 8 and 9 were unanimous about the need for an overall review of the obligations and how they are to be implemented from a regulatory perspective. The challenge to the operators is that the regulator has to be clear on what should really be achieved strategically (Respondent 8) and that the meaninglessness of the obligations without strategic alignment (Respondent 4). Such alignment would allow for the definition of the size of the universal service target and the funds required for achieving this target (Respondent 9). As Respondent 7 pointed out, the goal of infrastructure in every area is contrary to basic economics and, supporting that, Respondent 9 argues that a way to deliver the benefit to the people who need it is required, rather than just rolling out services everywhere.

In summary, it was found that the operators, be they national network operators, USALs or VANS, are all facing similar challenges. Those challenges stem directly from the effectiveness issues identified in section 4.4.2, although in varying degrees and with varying levels of impact to the organisation.

4.4.4 *Measurement of Universal Service*

The measurement of the provision of universal services and access was debated at length with the respondents who were interviewed. The finding in general was that accurate measurement would be impossible until there are concrete targets. Respondents listed a range of possible measures which could be utilised, depending on the target which is ultimately intended. These measures include:

- Teledensity and coverage
- Service offerings available
- Minimum bundle of services available to the consumer
- Outcomes/throughput in training initiatives
- Financial sustainability/success of initiatives
- Flow of funds to initiatives from the Universal Service Fund

Some of the standard measures currently utilised in the industry to measure both Universal Service and general progress were considered by the different respondents to be inapplicable. Teledensity, as discussed under the definitions and targets, for example, is considered to be an outdated measure which is primarily applicable to the fixed network environment (respondents 4, 7 and 9), Similarly, while the network coverage and general availability of services were considered as a possible measure (respondents 2, 5, 11), the extent to which the services and infrastructure is utilised, using number of minutes, traffic statistics and data throughput types of measures, was also suggested as better indication of the realistic provision and utilisation of services (respondents 3, 8, 9).

The most consistent measure which could be applied to all of the above, however, was found to be the cost of services and affordability of the services for the consumer. This was the ultimate measure of whether the services are truly available universally to all sectors of the population or only to those affluent enough to afford them.

Respondents 4a and 4b raised an important consideration, though, which should encompass any measures put in place. The targets and associated measures have to be specific, internationally comparable, accepted by all the players in the industry and linked to the definitions. If the measured outcomes are not comparable to international standards, they will not be able to stand up to a robust interrogation of the achievements realised. Respondent 9 proposed that should classic business management concepts be applied, targets ultimately will drive the measures and therefore the need to be SMART – in being Specific, Measurable, Actionable, Realistic and having defined Time frames for delivery.

4.4.5 *Suggestions for progressing service provisioning*

The second sub-problem of the main research question was focused on how to advance the provision of services within the ambit of the provision of universal services. While no specific research questions focus on this topic, it is considered by the researcher to be a core element of contributing to the universe of knowledge. While it would be relatively simple to identify problems, the aim is to propose potential solutions or routes to solutions.

When discussing the effectiveness and challenges related to the provisioning of services with respondents, needs for improving the process were identified simultaneously with the issues being raised. Due to their differing perspectives, not all respondents obviously saw the same problem areas; however, this is what would enable the identification of a cross-functional route forward.

In evaluating future models, a number of different focus areas were identified from the responses. These will be dealt with separately as three broad areas.

a. *Regulatory Strategy*

The role of the regulator was identified by respondents as being to establish and manage a level playing field for the operators to compete in. This would entail the regulator providing operators with regulatory oversight and decisions, as required. In terms of universal service, it was noted that there has to be political will to deliver the services and solve the industry problems. For this to occur, one respondent suggested that the industry therefore has a requirement to lobby and challenge the current processes in order to advance.

Most respondents identified a single cohesive strategy for the provision of universal services as a primary need. This strategy would be required to have a long-term vision, aligned with the government vision, such as “Bridge the Digital Divide” and would contain clear steps to be taken, with timelines for delivery. One respondent noted, however, that the strategy should not look too far into the future as it would risk losing track of the immediate goals. The strategy, according to this respondent and others, needs to have a short-, medium- and long-term approach.

Most respondents, from both industry and the regulatory environment, identified the need for cooperation between all players as an important component in moving the provision of services forward. Such cooperation would be required to give the regulator a view from both suppliers and operators of the technology and services in the pipeline, while at the same time allowing the operators to access the regulator and voice their concerns and requirements. Respondent 8 even suggested that the operators should coach and support the regulator in policy definition, while at the same time trying to resolve the “laundry list” of issues which needs to be established.

As discussed in section 4.4.4 as well, the strategy will need to clearly define targets, processes and measures that will constitute the agreed norm. This establishment of an agreed set of definitions and measures would be required to align the approach of

all the players and obtain agreement on the principles, definitions, targets and how to operationally execute the projects (respondents 6 and 9).

This cooperatively developed overall strategy would also enable the brokering of a win-win situation in which all parties would engage. Many respondents throughout the interview process and also in relation to this question reiterated that the operators would only want to provide services if they were commercially viable and would therefore require some incentives for providing services, rather than purely doing it on a grudge basis.

b. ***Organisation and management***

Respondents, in conjunction with the need for the strategy, also reiterated that the mandates of the different organisations needed to be clarified and reinforced. The organisations should then perform according to those mandates and not across the responsibilities of other organisations.

The primary aim of this requirement from respondents related to that of the USAASA who to date, according to themselves and other respondents, has functioned without a clear purpose and outside of the defined mandate. USAASA should be responsible for managing the process of delivery services from a coordinating perspective. The agency, as defined in its mandate in terms of the Act should focus on:

- Finalisation of definitions
- Establishment of targets
- Management of the distribution of funds
- Running of competitive tenders
- Performing research on services

- Monitoring the provision of services

According to the respondents, the agency should not be rolling out projects and infrastructure themselves. This should be left to the operators who are established and have the infrastructure and experience to execute the tasks. USAASA, however, should be providing the so-called wish-list of services, for which operators will either tender or be required to deliver in terms of USOs. This said, USAASA would be responsible for managing and driving the provision of subsidies for the different needy peoples identified as target markets in terms of the definitions and goals. This falls within their mandate of managing the utilisation of the USAF resources to promote universal service.

A further need which has to be addressed is that of the skills and resources allocated and developed in USAASA and ICASA. The lack of correct skills and restriction on resources was identified by respondents as a problem with regard to effectiveness and, accordingly, is an area for improvement in future. Respondents presented a range of suggestions for increasing the available skills; from restaffing the organisation, retraining the current staff or even the utilisation of external consultants to achieve the required direction and impetus.

As the regulator, ICASA, as shown above, is responsible for providing the level playing field. Respondent 7, however, raised the concern that the regulator should not be responsible for managing, or rather policing, anti-competitive issues or disputes between operators. As the authority and the agency do not have any legally enforceable powers in terms of competition-related disputes, these would be better managed through the Competition Commission.

c. *Physical delivery*

When evaluating steps which can be taken and issues to be considered in the realm of the physical delivery of services, there were a number of different aspects which the respondents considered important to investigate.

The need to make the provision of services a competitive and commercially profitable process was identified by respondents. Operators would only be interested in actively supporting initiatives which are commercially viable. The process of running competitive tenders for the provision of services was therefore raised by a number of respondents as a requirement. While this is in the act as a possibility for USAASA to utilise, it has not been driven practically. By utilising competitive tenders, operators would also provide the most cost-effective solution for the provision of services as they would only win the tender by requiring the lowest subsidy. This process, however, would also enable the operators to access the funds which they paid into the USAF and thereby reduce their effective financial burden from the obligations.

A related concept that was proposed was that the government should fund and establish the primary local infrastructure in the under-serviced areas. The funding for this would be made available from the USAF. The actual operation of the infrastructure and provision of services would then be awarded through a tender. As this would eliminate the initial infrastructure for the operator, the cost of providing the services and the affordability for the consumer would be improved.

In support of making the provision of services more affordable and competitive, the topic of the interconnect fees and structures was raised, particularly by Respondent 8. The interconnect fee is the largest part of the airtime rate charged to consumers and accordingly also comprises one of the biggest costs to the operators. As the current rate is the same for interconnection between all the different networks, this

creates an uncompetitive situation for smaller operators including community-based and USAL-type operations. This is due to the volume of calls which terminate within the operator's own network, in the case of the large operators being significantly higher than those of the smaller operator. The lower the number of calls which interconnect to other networks, the lower the total interconnect fee.

It was suggested that an asymmetric rate could be implemented, whereby the interconnect rates charged would differ depending on the originating network and location of the call. This would allow for more affordable and competitive rates to be offered, not only in under-serviced areas, but also by smaller operators who do not have the infrastructure presence to compete with the national operators.

4.5 Conclusion

The secondary research provided a base for understanding the perspective from which the interview responses would be generated. While all statistics were not available within the public domain for the secondary research, the general structure of the industry is well understood and clear from the documentation. The envisaged roles and responsibilities, as well as the targets which were formalised, are available for all to see. The fact that they are not as detailed or comprehensive as may be required is part of the interpretation of the findings.

The interviews that were conducted revealed common areas of interest, opinion and concern voiced by the majority of the respondents. While the exact wording and means of expressing the opinions obviously differed, a common set of issues and themes were clearly developing as the process continued. These findings will be interpreted further in Chapter 5, which will provide the reader with a perspective on the meaning of the different opinions as a whole.

5 INTERPRETATION OF RESULTS

5.1 Introduction

The information presented in the previous chapter will be compared here with the concepts evaluated in the literature review. Whereas the findings have been classified in a structure aligned with the topics and interview schedule, the interpretation has been conducted in such a way as to determine the primary themes which are evident in the research findings. The analysis conducted in this section will be utilised to answer the research questions posed in the context of the research.

Analysis of the findings presented a number of different focus areas or themes which provide a meaningful structure for interpreting the outcomes. Where relevant literary references were obtained, these are provided in the course of the interpretation. However, the literature analysed as specific to universal service does not relate directly, in some cases, to the theme/focus area identified.

The two primary themes identified within the research findings are further broken down into a number of sub-themes containing the detailed steps and relations to the literature.

The primary themes which have been established from the findings are:

- Direction

  This theme is focused on the aspects of an overall strategy for the provision of Universal Services in South Africa.

- Delivery

The delivery theme is focused on the more practical aspects identified in the research related to the implementation of Universal Service in South Africa.

These themes and their analyses in relation to the literature and the research findings are discussed in detail below. Due to the nature of the topic and research literature utilised, there are some common points between the themes which emphasise their inter-dependent nature. Each theme will conclude with a summary of the relevance to the applicable research questions and the chapter will conclude with an analysis of the different actions which have been identified from the findings as possible means to improve service delivery.

5.2 Direction

The direction theme is focused on elements relating to an overall strategy for the provision of universal service. The topics identified in this theme are related primarily to research questions one and four, which are re-stated below for reference.

- Question 1: What are the goals which are to be achieved under the banner of universal service in South Africa in terms of the target markets and services which will be supplied?
- Question 4: In relation to the implementation of universal service in South Africa, have the correct targets and executions against those targets been measured when evaluating the success of Universal Service and the USAASA in South Africa?

In the literature review it was discovered that the needs in terms of universal services follow a staged life cycle dependent on the level of development of the country and economy under analysis (Milne, 1998). It was also found that the definition of

universal service should be evaluated in terms of the types of services and solutions which are realistically possible and needed by the users, taking into account technological advancements such as mobile telephony and the internet (Blackmann, 1995).

In the research conducted, the various factors related to establishing a clear direction were found to be common not only to a number of respondent interviews, but also in the secondary data. The sub-themes or focus areas identified covered the different aspects, from the definitions and target groups through to the setting of goals and the establishment of the necessary processes, structures and measures required to support and determine the attainment of the goals.

Many of the respondents identified the lack of a cohesive strategy as the failing point of universal service provisioning in South Africa. The clarification of the elements of this strategy could provide the direction required. The three sub-themes which were identified and assist in providing a structure in which to assess the current status are Definition of Elements, Target Determination and Organisation and Programmes.

5.2.1 *Definitions of Elements*

Peha (1999) gave the simple definition of universal service as “making telecommunications services available and affordable to a greater fraction of the population”. The maturity of the network and country will, however, have an effect on the goals of universal service (Milne, 1998) and this is quite relevant to South Africa as an advanced developing economy.

The research has identified that there are different needs in South Africa and, as such, the definitions need to take these into account. The definitions which are required in the South African context would cover the areas where services are

supplied, the people who should benefit from services and, of course, the types of services which are envisaged to be in the scope of universal service. Without the definitions, the establishment of clear targets of which all role players have a common understanding would be impossible to achieve.

a. *Areas and people to whom services should be provided*

The research found that the definition of under-serviced areas was rendered inadequately. The literature suggested that the rural, outlying and low income groups (Blackman, 1995) should be included as part of the scope for providing services, while Peha (1999) found that there was no restriction on the areas in some cases. Hammond (2005) also included school age, indigent and other rural groups, possibly even the unemployed, as relevant regarding the provision of services.

Through the research that was conducted, it was found that the formal definitions of under-serviced areas had not been completed. The licence conditions of some operators contained definitions that varied, however, in that under-serviced areas were defined as areas with teledensity levels ranging from 5% to 10%. It was noted by some respondents that the definitions of target areas for the roll-out of services such as the Community Service Telephones followed the definitions closely. In some cases, the target areas supplied by the regulator were in the heavily populated and developed urban areas. The proposal from the USAASA uses a basic definition for an under-serviced area as one in which the penetration is less than 10%, however this was not formalised and definitions are currently still being finalised by the department. In the USAL concept, however, under-serviced areas include a mixture of rural and urban communities. This definition of the areas was also initially implemented in this way to provide USAL operators with an economic base on which to build their business, rather than on purely low income consumers.

The people to be targeted for the provision of services in the South African context, while again not completely formally defined, are in line with the recommendations for including of school age, low income and rural communities (Blackman, 1995; Mueller, 1997; Milne, 1998; Chone et al., 2000; Bhuiyan, 2004; Hammond, 2005) in the group. The target groups include schools, disabled people and under-serviced rural areas. The shortfall in the current legislation is that, apart from the clearly identified groups above, the formal definition of the term “needy people”, which is used in the legislation, is not available. This term can be interpreted broadly and therefore cause some confusion about whether the targets are being met.

The respondents also indicated clearly that there are different groups with different needs, therefore there should not be a singular approach. The aim of bridging the digital divide would support this view as the need for basic communications services in some areas is replaced by progressing to providing enhanced services such as data services in others.

b. *Service types to be included in the definition*

The above point leads to the evaluation of which services are to be provided to these “needy people” once they have been defined. While one component of the universal service definition concerns where the services are required, the definition of what those services should entail is a crucial second component. While the basic understanding derived from Milne (1998) and Blackman (1995) is that the original intent was for a basic telephone connection, the need for broadband services is becoming a real demand based on technological advancement (Blackman, 1995) and the need to bridge the digital divide (Xavier, 1997). Bhuiyan (2004) went further, arguing that the developing world needs to address this need to advance access to information.

The different policy directives which have been issued over the years have progressed to broadly include a variety of services. These obviously include the basic voice services, but also fax, email and other data-based services. In support of this direction, the obligations placed on operators have been extended to include internet connectivity. Additionally, the discounting of tariffs related to the provision of these data services has been done, especially in terms of the e-rate system. However, the shortcoming is, again, that the definitions and targets, outside of the obligations, have not been aligned and formalised. It would seem that the approach is somewhat disjointed.

The respondents largely agreed that the need has shifted to include data services as a must have in terms of universal service. While there are some areas where the most pressing need is for the provision of voice-based services, universal service itself should include access to voice and data services as a fundamental requirement. This split should take place when the actual goals and projects are established and it would be advisable at that stage to consider Sawhney's (2000) warning that caution should be exercised in expanding universal service due to the differing information needs of people. It is interesting to note that the proposed definitions published by the USA focus on the universal access components rather than services. This was in keeping with the strategic intent at the time of providing access to communications for all in the country. With the changes in the industry and policy direction since then, this should have been updated to account for the new focus on service rather than access.

While not mentioned in the literature as a definitive part of the universal service definition, the skills of the target groups to utilise the infrastructure and services provided through universal service policies, also need to be evaluated. While very much a goal, the respondents pointed out that the ability to utilise and accordingly benefit from the services that will be provided must be considered when rolling out policies. Martin (1997, in Sawhney, 2000) raised the question of whether simply providing the connections would create the capability within the public. The

respondents argued similarly that the advances in technology such as mobile data could shift the focus away from a “have and have not” scenario to one of “can and cannot utilise”. The definitions of what universal service therefore encompasses, should consider skills development and training.

Interestingly, the development of skills featured strongly in the goals and programmes, while not being part of the proposed definition. The need for skills development and advancement is therefore recognised within the realm of the universal service policy. It was also stated by respondents that the goal of universal service projects, in many cases, is the social development and advancement of communities and in this spirit, skills development would have to be of be primary importance. The close co-operation with the Department of Education for the obligations and USAASA targets for provision of services to schools would also indicate that, while a formal definition could not be found at the time of conducting this research, the intent has clearly moved to include these services into the areas of focus.

5.2.2 *Target determination (who, where, what and by when)*

The determination of clear and measurable targets for the implementation of universal service has been identified in the research as one of the main shortcomings of the current environment and also one of the primary needs in advancing universal service. Milne (1998) proposed that these actual goals would depend on the level of the market development. It was also mentioned by a number of authors that the instruments utilised to drive the service provisioning, such as pricing technology, scope, funding mechanisms, etc., could have an effect on the economic feasibility of the programmes. (Blackman, 1995; Chone et al., 2000; Gasmi et al., 2000; Cremer et al., 2001; McElhinney, 2001; Chone et al., 2002; Hoernig and Valletti, 2002; Valletti and Hoernig, 2002; Hammond, 2005). This issue was raised by the respondents as well, in that, while the regulatory organisations are following public interest, the operators will always focus on economic principles when

implementing any obligations or projects. The goals which are set, be they roll-out-based or price-driven, therefore need to take this differing view into account in order to find a win-win solution.

In the current environment, the most clearly established targets are those related to the universal service obligations. These goals are established in the network operating licences (see Table 9) and have only been updated alongside changes in the licences due to requirements such as new technology or services the operators wish to utilise commercially in the market place. The other goals which are established are the strategic goals of the USAASA (see Tables 7 and 8); formalised national level goals could not be determined, however.

In contrast, it was found during the research that, from a regulatory perspective, definitive goals are considered as being impossible to set due to the constantly changing technology. While the technological environment is dynamic, the question whether the strategic socio-economic goals cannot be formalised has to be asked, though, This is especially relevant considering that socio-economic development is considered one of the primary objectives and benefits of the universal service policy by most respondents, as well as in the literature reviewed.

When looked at holistically, the different current goals do meet some of the requirements of the high-level definitions, however, as mentioned by some respondents, whether they are still valid and are being driven by the correct organisations is questionable. The achievement against these targets also raises questions with regard to the structure of the goals and the organisations enforcing them. As indicated by Chone et al. (2002), the role of the regulator is to enforce the obligations. The evidence in the South African environment, however, suggests that, while the regulator established obligations and projects, they have, rather than enforcing it, been a hindrance to the implementation thereof. The fact that goals have been set and cannot be implemented due to guidance and decision-making

problems of the regulator leads one to believe that the regulator would not only be pressed to actually enforce an obligation, but quite rightfully may be questioned on their role in the lack of delivery.

An example of where this currently affects the provision of services in the South African market is the case of the Cell C and MTN dispute over Community Service Phones. In this case, MTN disputed whether CSTs rolled out by Cell C were in valid under-serviced areas and refused to apply the lower interconnect fee identified with these phones. As the regulator has not completed its evaluation and is currently considering the validity of the roll-out areas submitted by Cell C, this dispute could affect the provision of services, as well as the results of the operators due to the impact on the associated costs of the services.

One of the respondents proposed that the goals for universal service need to follow the normal management processes of utilising SMART objectives. This would require that the exact goal of who, where, what, when and by whom would become part of the objective and could be measured accordingly. In evaluating the secondary documentation it was evident that, while the individual projects for meeting the initial obligations and other projects had clear planned objectives, the overall policy goals of universal service were not as clear. No evidence could be found of a goal or target for a realistic objective for the implementation of the universal service policy.

The same can be said of the affordability measure for universal service. While affordability is mentioned in terms of being affordable to most people in the definitions proposed by the USAASA, evidence of formalised goals on affordability could not be found. The same can be said of the policy directions and legislation. The affordable access to services is an objective of the legislation; however there are no specific targets that would allow anyone to determine whether this has been achieved.

There is an established tariff policy for different projects such as CSTs, Community phones and e-rates for schools; an overall target concerning improving the affordability of telecommunications was not available, however. One respondent mentioned that this is something which is really needed to drive the topic as a visionary type of objective. While the licences of the operators do specify that special tariffs should be applied to the CSO-related phones, the delays and lack of agreement and regulatory approval of such tariffs, particularly in relation to newer obligations such as the 1800 MHz free sim-card obligation, were identified as hampering the implementation of the programmes.

In relation to the standard statement that the tariffs comprise a tool that the regulator is able to use, this has not been applied effectively in South Africa in some cases. The tariffs for the as yet unsupplied Sim-Card packages were to be agreed upon between the operators themselves and then agreed with the regulator. As operators will always act from a commercial basis, this process could result in rates that do not serve the universal service goals. Additionally, the delays in the regulatory process could be increased due to ongoing disputes over what is realistic, not only between operators, but also with the regulator.

A respondent mentioned that President Thabo Mbeki has voiced the goal of reducing the cost of mobile telephony, but this is not quantified in the documented goals. This type of goal would require pricing policies for services beyond just those in under-serviced areas, similar to the example from Viscussi et al. (2005) concerning AT&T. But, while the policies support the principle, the physical implementation is not being achieved.

The cost of providing universal services and the associated tariffs to be charged are largely dependent on what needs to be supplied. These services would include

targets governing the quality of services. The quality of service is a tool available to the regulator to manage industry deliverables (Viscussi et al., 2005) and was also identified by the respondents as a possible measure in the case of universal service.

The quality of service is not specifically established as a target for the provision of services. While the obligations for the provision of internet services in terms of some of the licences specify minimum connection speeds such as 256 Kbps (Neotel Licence, 2005), this is not consistent in the licences. For example, Vodacom has an obligation to provide internet access, but no connectivity quality is specified. This, additionally, excludes equipment required for utilising the connection, except for some terminal equipment for schools for the disabled, which naturally raises the question of how this would be supplied to other institutions.

The overall cost for the projects is therefore difficult to calculate, as there is no consistent requirement of what level of service should be provided as a minimum. A consistent approach and a minimum level of service would facilitate the calculation of the cost for the foreseen bundle of services and required funding and applicable tariffs to be defined.

5.2.3 *Organisations and programmes*

The role of a regulator is to maximise the benefit to the national interest. This, however, is subject to a number of influencing factors from government and private organisations (Viscussi et al., 2005). The influence on the regulator and related organisations was identified by respondents as a factor in the effectiveness of the different structures, which needs to be taken into account when analysing the structures that are in place and their responsibilities.

a. *Regulatory and Operator bodies*

The structure that is in place in the South African market is quite clearly established both in terms of the legislation and the industry in general. The regulator, ICASA, the USAASA and the USAF all have clearly defined roles outlined in their applicable legislation, together with defined functions they are required to perform. It is in the execution of those roles and responsibilities that the respondents, as well as the secondary evidence, found evidence of failure. This is discussed in detail under the theme of Delivery.

While the envisaged roles of the regulatory organisations are clearly stated in the literature, the preferred structure and resourcing of the organisation is not discussed in detail. The roles and responsibilities of operators in terms of obligations and provision of services similarly are relatively self-explanatory and well defined in the licences and legislation. The risk identified in the research problem that a lack of understanding of the operator's obligations could be considered as being of lesser probability.

b. *Funding programmes*

The structure of a fund such as the USAF is an established global standard and the South African instance, according to Milne (1998), was an area of focus to evaluate the effectiveness thereof. The respondents agreed that the fund, in principle, was a good concept, but the management thereof, as mentioned above, was an area of concern. The responsibility for its management resides with the USAASA, but the collection of contributions takes place via ICASA and this is paid into the national treasury. Whether the structure of the fund as a predominantly Pay-and-Play type of model is correct was also raised as a concern. The model requires a contribution to the fund, as well as the execution of universal service obligations and granting of subsidised rates. As the operators are not always reimbursed from the fund, they effectively experience double taxation on the earnings.

The application of the USAF contribution obligation has been revised in the ECA to cover all operators from Internet Service Providers through to National Network operators, which evens the playing field somewhat. The redistribution of funds, though, is still not effective, according to the respondents. The contributions to the fund and the total value of the fund have varied and have been a point of debate since its inception. The original contribution structure only focused on the primary operators, with the VANS, ISPs and PTN licence holders only contributing a nominal amount. This structure has been revised and the contribution logic now seems to be consistent. The structure that existed prior to the revisions brought about by the ECA would have raised more real concerns.

As the new licences in terms of the ECA had not been issued at the time of this research, the actual implementation of the new funding structures will depend on how those licence conditions are implemented. The total value of the fund, apart from the expenditure budget, could not be quantified. This has resulted in the current value being an estimate based on the revenue of the industry and the envisaged contributions.

Within the current legislation and mandate of the USAF, the different programmes for the utilisation of the funds which were identified in the literature are all available. The process of utilising reverse auctions, subsidies for both the consumers and providers, as well as reimbursement for roll-out outside the obligations and subsidies of interconnect, can all be applied. These different options are utilised only partially, however. This will be discussed in greater detail when evaluating aspects of delivery.

c. *Resourcing*

As was the case with the structure of the bodies supporting US, the literature does not provide much information on the required resources of the regulatory or operator

organisations. The lack of resources was identified as a cause of concern in terms of performing the required roles, not by the respondents only, but also in research conducted previously. These resources are not only financial, but also involve staff and skills. This is partially brought on by the method by which the organisations are funded: they need to justify expropriation from the national fiscus as their budgets often are restricted. The lack of resources was also raised in the Universal Service Agency Impact Report which was evaluated as part of this research. In this report, the resource shortage at both ICASA and the USA were identified as inhibiting their effectiveness.

In evaluating responses in conjunction with the organisation's structures and the activities being performed, however, the researcher came to regard the lack of the correct skills and adherence to the mandated roles of the different organisations as a more serious problem. This is well exemplified in USAASA, where the project organisation focuses on their own roll-out projects rather than on co-ordination of operators and regulator to optimise the projects and processes. While financial resources would be required to obtain and retain the appropriate resources, the organisations are extensively staffed and could possibly utilise the available resources more appropriately. The respondents identified the lack of the correct skills as impacting on the industry due to delays in guidance, approvals and decision making.

Resources and structures must be set up and managed to be supportive of roles and responsibilities as outlined for the organisations. This is especially relevant concerning the challenges identified in terms of the execution of the current projects and processes.

d. ***Political influence and pressure***

A further impact on the effectiveness of the organisations was that of political interference. As Viscussi et al. (2005) pointed out, the regulator is subject to influence from government and private organisations which is quite evident in the case of the South African regulator. The amount of influence originating from overall government policy which is exercised by the Minister on decisions of the regulator can affect effectiveness and delivery on the part of the regulator. While the direct power of the Minister over the regulator has been challenged and curtailed previously (USA Impact Report, 2005), this currently, according to some of the respondents, does not seem to be the situation on the ground.

While Viscussi et al. (2005) point to private organisations having an influence, respondents from the industry felt that their opinions and recommendations are not considered in policy decisions. In contrast, it was proposed that to risk being out of political favour could affect the industry participants through future decisions. The result of this is a lack of will to become involved and resolve the problems. As pointed out by Magat, Krupnick and Harrington (Viscussi et al., 2005) a relationship and financial influence with a regulatory agency can have more effect than comments and proposals concerning decisions which need to be taken. This seems to be the case in the South African context.

The above interpretation of the situation concerning the strategic structural elements is directly related to the theme of delivery in which the impact of these factors comes to the fore.

5.2.4 *Conclusions*

The overall conclusion to this theme is that there is a lack of clarity and direction in general in the Universal Service Policy. While there is clear intent to provide services

to a target market, there is no common understanding of exactly where that market is and what to provide. Therefore, with goals being defined on an individual level per operator and for certain projects as documented in the findings, there is no common universal service goal against which organisations and programmes can be measured.

This missing set of goals which would drive the direction of universal services can therefore not be measured. As for establishing whether the correct measures have been put in place, one would have to say that they are not. Teledensity is still at less than 15% and access to data services for all has not been realised. While each project is measured by the organisation implementing it, there is no consolidated measure of whether the Digital Divide has been bridged sufficiently.

5.3 Delivery

The theme of delivery is focused on how the overall policy has been put into execution. Many of the literary sources on the concepts are the same as those related to the Direction however the analysis is drawn from the more practical/operational findings rather than strategic focuses.

This theme was found to be most relevant to research questions two and three, which focused on the effectiveness of the programmes and the challenges that are experienced. The questions are restated here for reference purposes:

- Question 2: Are the existing structures and processes put in place for the provision of Universal Services in South Africa, suitable for the effective delivery of the services?

- Question 3: What are the challenges facing network operators when providing services aligned with the universal service policies and targets?

The delivery of the agreed services to the different target markets or under-serviced peoples is affected by and requires co-operation and interaction between a number of different role players and programmes. How the service delivery tasks are identified, planned, allocated and funded and the management of the processes surrounding these different tasks will obviously affect the success of the initiatives. It must also not be forgotten that the long-term sustainability of these Universal Service initiatives is affected by the initial delivery activities and programmes.

Within the area of delivery a number of sub-themes closely aligned to the findings themselves again were identified. These identified sub-themes are Project identification and assignment, Regulatory guidance and resources, Application of funds and, lastly, Sustainability factors. These themes are directly influenced by the direction indicated, as these represent the actions while the Direction theme comprises the strategic directive guiding operational management.

5.3.1 *Project Identification and Assignment*

The projects which are identified for implementation should support the overall strategic goals for universal service policy. As identified in the previous section, the strategic goals specific to universal service appear to be lacking. Projects which were identified therefore have largely been implemented without a cohesive strategy or any thought to the business cases behind them. Furthermore, revision of projects to changing needs has not been consistent.

a. ***Identification***

When identifying the universal service goal types in terms of the five stages proposed by Milne (1998), the needs identified by the respondents which are currently targeted in terms of the projects in execution reveal a range of different stages of maturity. While indicators such as teledensity and income levels are probably closer to Stages 2 and 3, the focus of management, industry research and telephone company culture falls more into Stage 4. South Africa clearly is an example of the argument that one country can be in multiple stages at any time with a variety of focus areas.

The projects which have been identified for execution from the secondary research can be seen to have followed the stages of development. Where the obligations imposed on Telkom, Vodacom and MTN initially were aimed at providing Stage 2 type access services to the broad population and geographic coverage, this has changed with the advancement of the networks. Later obligations, or goal types, focused more on economic and social benefits, such as the development of schools and other public service organisations as well as the social development benefits which can be derived from those organisations having access to the services.

The projects initiated by the USAASA had similar goals in that they were aimed at providing communities with access to services and uplifting communities, as well as the individuals who ran the telecentres. It is interesting to note, however, that the level of teledensity associated with Stage 4 of between 35% and 60% is far above that achieved in South Africa, while the policy has developed strongly into these later stages. Mobile coverage and relative density has far outstripped the fixed line supply and service provisioning.

It is also significant that methods of providing services have moved straight into Stage 5 through using mobile and internet technologies in order to satisfy socio-economic demands. As mentioned by the respondents, technology has changed the way that the services can and have been provided.

The respondents pointed out that the projects and the need for universal service require both data and voice services of some sort. They also noted that the needs occur in a changing environment, along with applicable technology, both of which need to be considered. It therefore requires, as Shanmugavelan and Warnock (2004) have pointed out, that creative strategies be devised for identifying the projects which must be implemented. The approach thus far, of relying on the obligations alone, cannot reasonably continue. When looking at the way in which the obligations have been managed and enforced, it is clear that they have not been efficient in meeting the changing needs fast enough.

While respondents have commented that USAASA has operated in the mode of an undirected government department and has not been successful, the actual projects identified are quite applicable, at least in terms of services, even if these were not within their official mandate to implement or efficiently done. The services provided through these projects are in line with the unofficial goal of bridging the digital divide and are also in line with their own approved strategic business plan. The alignment of this to their official mandate is a separate issue to be addressed in the section on roles and responsibilities.

Within all the projects, however, the issue raised by respondents of USAASA being responsible for identifying projects but being insufficiently skilled, results in questioning the logic behind the projects. The impact of the skills shortage on the establishment of business cases for the different projects, including obligations and other initiatives, is a shortcoming which would not be tolerated in a normal business environment. While the projects may have been executed due to a perceived lack of action elsewhere in the industry, this does not justify the utilisation of resources, both in monetary and staff terms, for initiatives which did not fall in their sphere of responsibility.

b. ***Assignment***

The assignment of projects to the different parties responsible for the actual execution is a process which is in need of review. While the assignment of obligations to the operators in terms of the licences is clear and agreed to by the operators, the alignment of the responsibilities for the execution of the different project components does not appear to be guided by any real process.

The method used to allocate the projects for execution can take a number of different routes, such as requesting the provision of a service in terms of licence conditions, through auctions or through a pay-or-play model, all of which can be utilised when determining who should roll out a project (Blackman, 1995; Nett, 1998; Chone et al., 2002; Hodge, 2004). The allocation of the obligation related to the service needs to account for the competitive environment and, as such, also the economic viability of the project and how it affects the operators' profitability (Weller, 1999; Chone et al., 2000, 2002; Valletti and Hoernig, 2002). The actual requirements of the obligation may also affect the costs of delivery and affordability to the end user (Viscussi et al., 2005).

When evaluating the respondents' feedback, it was noted that the obligations imposed on the different operators were not defined in terms of a business case. While they were not considered particularly onerous on the operators, the lack of business case or due diligence, considering the scale of the projects, would not be allowed in a normal business environment. The business case would also allow for the alignment of the project to the strategic direction.

In the case of some obligations, the decisions related to execution and inter-relationship between operators is left to the operators. While this in principle is efficient for the regulator, it could also result in conflict between operators, which may have a negative effect on the provision of services overall.

An example is the provision of internet connectivity to schools in terms of the 3G licences. In terms of the licence conditions, the operators need to co-ordinate activities with the USAASA, Department of Education and other entities, to determine the institutions to which they will supply services. This process is time-consuming and a duplication of effort as there is a minimum of two operators performing this task,. If this information were to be supplied as part of the licence obligation, the services could possibly be rolled out faster. Furthermore, the delay is exacerbated by the communications infrastructure not being the core business of other government departments and further delays in terms of priority. While these departments do want the connectivity and services, their focus may be on items of higher priority such as basic infrastructure, security and skills development.

As new entrants enter the market and receive obligations in terms of the ECA, this process, if continuing in the same way, would cause further bottlenecks, duplication and delay. With the new licences in terms of the ECA currently being under development and assignment, this will be an interesting development in market dynamics and universal service in general.

The co-ordination of projects executed by USAASA would also be subject to these problems and have further implications. With the USAASA rolling out projects in under-serviced areas, these could be in competition with the obligatory CSTs which have to be rolled out there, as well as the USAL concept which USAASA themselves is supposed to be supporting. This would affect the commercial viability of the operators' business case. In the case of the USAL concept, the impact could be severe should a national operator be rolling out infrastructure in terms of the USO in an area in which a USAL holder is attempting to establish operations. The difference in scale of operations and financial muscle will potentially cripple a USAL business.

While it was shown that the USAASA projects were undertaken because no action was really being taken elsewhere, this in itself reinforces that the process of

alignment in the identification and allocation of universal service needs is lacking in the South African context. The USAASA projects, which, according to the findings, should not be executed by them, could for example actually be used to support operators such as the USALs. That said, the USAL concept in itself does not receive the support it could have expected, either through regulatory action or through protection from competition.

The USAL operators, who largely are considered to be unsuccessful from both the operator and the regulatory perspective, are affected by the regulatory shortage of resources and lack of decision-making ability. The fact that only 7 of the 27 envisaged operators were licensed by the beginning of 2007 indicates that the regulatory support and drive to get them established is lacking. This was also identified as a problem by the respondents. Further licences were issued in mid-2007, but the concept was placed under review by the minister just after these were granted,

In May 2007, the Minister of Communications announced, in Government Gazette No. 29923, that the USAL concept was to be reformulated as a provincial operations concept. This would require the consolidation of some operations and in many cases would result in the reformulation of business plans, cases and financing determinants. The pressure that this will put on the licensed and potential applicants is still to be seen when the concept is finalised.

5.3.2 *Regulatory guidance and resources*

As stated earlier, Viscussi et al. (2005) identified the role of a regulator as being to maximise the benefit to the national interest by utilising legislative responsibilities and authority. It has been mentioned earlier that the organisation of the regulator has not been discussed in much detail in the literature; the issue of resources, however, is a major theme in the findings. The fact that the universal service policy needs to take into account many aspects, such as the technology, funding mechanisms,

pricing, and competitive aspects, would imply that the regulatory bodies tasked to implement universal service need to be staffed with sufficient and skilled resources.

The findings identified issues from both the secondary and primary research which pointed to a number of areas in which the regulatory organisations were identified as having to deal with the issue of resources. These included the universal service definition process, issues concerning the allocation of obligations, the decision-making process as well as problems related to the roll-out achievement for certain projects.

The lack of progress in the provision of universal service has been attributed to a lack of state guidance and a shortage of funds for organisations such as the USAASA (Cole, in Mochiko, 2006) to achieve their mandates. This was reinforced by the respondents who pointed out that the regulatory bodies where not staffed correctly and in the process of funding not sufficiently financed to attract and retain the skills required to perform their tasks. The execution of projects outside of the mandates of the organisations contributed to the resource drain while simultaneously putting the organisations on a back foot as the projects failed.

The challenges are not limited to USAASA, but also occur at the regulator, ICASA, where the decision-making process and lack of project execution connected to regulatory issues have resulted in a number of delays. The regulator has a very broad mandate, which includes broadcasting and postal services, since the Amendment Act of 2006. While these responsibilities are all communications related, the reach of knowledge required for the different areas is very wide and, if not sufficiently supported, delivery according to the mandate will continue to suffer.

In interpreting the findings, the researcher formed the opinion that, besides the lack of technical skills required in the regulatory environment, as identified by the respondents, the issues are embedded even deeper in the management realm.

While the funding and skills seem to be the incorrect ones, the management of those resources has also not been carried out efficiently. USAASA, for example, has been performing far outside of its mandate and this has caused the drain on the resources and possible waste of funds. As pointed out by Paul Cole (in Mochiko, 2006) this shows a lack of guidance on the part of the Department of Communications in enforcing the mandate. This lack of guidance is partially attributable to the lack of an overall strategic direction for Universal Service that, accordingly, could result in there being no limitations or control over who does what.

It is important to note that, in spite of the number of challenges facing the regulator and USAASA, the intention has never been to not deliver. One respondent summarised it as that there is a passion for delivery of universal service in the regulatory environment and government in general, but there is a shortage of the logistical skills to actually implement on the basis of this passion.

5.3.3 *Application of Funds*

The application of the funds available for the provision of Universal Service and the challenges identified therein are a good example of where the skills and management have been lacking.

a. *Administering the funds*

The USAF concept itself is in keeping with the international process for the funding of universal service projects. While there are models wherein a fund is utilised, these largely place the requirement for service provisioning directly onto the operators only, and usually on the incumbent. The South African USAF is funded by means of contributions from all operators, even those specifically set up to provide services to under-serviced areas which are a percentage of the annual revenue of the operators.

This makes the calculation of the contributions relatively simple and sustainable, which, as shown by Intven et al. (2000), is a requirement of such a fund.

The other criteria for being administratively efficient (Intven et al., 2000), is not met by the USAF, however. The process for collecting the funds is rather complex as the payments are made to ICASA who then pays them to the National treasury. While this is relatively simple, it requires a significant budgeting and justification process for the USAASA to access the money once the funds are in the National Revenue Fund. While this in itself is not out of keeping with good budget control, the full value of funds required are rarely made available to the USAASA.

The management of the fund is also not efficient; it was evident from the research that the actual value of the fund is not really known. The researcher was able to determine the value of the fund from the National Treasury internet site, which raises the question of why this information is not known to the respondents. The way in which the funds are consolidated into the national treasury may still result in a loss of some transparency to the USAF management. Being within the total revenue fund could result in the funds being utilised elsewhere and not going back into the industry as intended. The financial management of the National Revenue Fund is outside of the scope of this research, however.

b. *Utilisation of funds*

The funds which are available in the USAF, in theory, can be applied to a number of different projects and through a variety of means. These can take the form of subsidies to call rates, project implementation costs or even reimbursement for the cost of providing and operating services on a monthly basis. All of these initiatives are allowed in terms of legislation governing universal service provisioning and are accepted norms in the industry as identified in the literature.

In the South African market however, the funds have not been utilised to their full extent. This is the result of the lack of direct access to the funds, but also of the issues concerning the roll-out of services. In 2005-2006 for example, only two of the seven licensed USAL operators received subsidies as they were the only licensees to meet the conditions of the subsidies. Similarly, the slow decision-making process at ICASA, is delaying the roll-out of internet connectivity to schools, which means that the utilisation of the funds to provide associated infrastructure and training is also delayed.

Further to utilising the funds in the existing programmes and projects, the use of other methods to utilise the funds are not being fully exploited. Many respondents listed the use of auctions wherein the operator requiring the lowest subsidy in providing services wins the opportunity to supply, as a route forward to encourage the provision of services. This method has been available in the legislation since the establishment of the USA, but it does not seem to have been used to date. The method is a globally recognised method of subsidising operations in under-serviced areas and groups. The fact that this has not been used would indicate once again that there is a shortage of relevant skills in the USAASA/USAF for administering such a programme.

While the funds have not been utilised fully, there also is concern that stems from evaluating the secondary research and from the respondents that the funds that are being utilised are going to projects which do not provide the value they should. Earlier discussion focused on the fact that USAASA undertook projects that were beyond their mandate, but within their strategic goals. The success of these projects was brought into question as they have been shown to be unsustainable and have taken exceptionally long to realise. The refurbishment of Telecentres and Community centres features strongly on the project list in the USAASA/USAF Annual reports. While these centres may be providing some services, the constant investments of USAF funds in refurbishing is a drain on the USAF for which there is no real mandate. While the targets for individual years such as 2005/6 seem to be achieved,

comparison with the original goals of the USA shows the achievement to be far behind where it should be. With implementation being as slow as it is, the refurbishments will also be required before the remainder of the centres are completed, resulting in having to spend funds on centres which have not yet realised any real benefit and possibly 'robbing' other projects of funding.

Other projects such as research initiatives and subsidies that are paid are within the mandate of the USAF. However, the delivery against the expenditure can be brought into question. In 2006, R3,013 million was spent on research into needy persons, however the definitions and targets had still not been finalised. The finalised report was not part of the published information and, as the definition process is still ongoing, according to the Agency, the value mentioned in that report would also be brought into question.

Overall, the USAF is a valuable concept and the fund itself serves a definite purpose, but the way in which the fund is managed and controlled and the funds utilised is not efficient. The process of administering the collection and distribution needs to be redesigned to align with international best practice. While the fund and the agency were a focus internationally (Milne, 1998), the current effectiveness would not be considered encouraging. The funding mechanism itself is currently working as a self-funding Pay-and-Play model in which contributions are not always seen to be put back into the industry or at least not into the correct places. This perception can be changed by utilising the correct tools at the disposal of USAASA and ICASA.

The long-term sustainability and economic feasibility of the universal service policy was highlighted as being dependent on how the different elements under the control of the regulator can be best utilised. (Blackman, 1995; Chone et al., 2000; Gasmi et al., 2000; Cremer et al., 2001; McElhinney, 2001; Chone et al., 2002; Hoernig and Valletti, 2002; Valletti and Hoernig, 2002; Hammond, 2005). This would include the sustainability of the funding mechanisms themselves, which, according to Intven et al. (2000), needs to be administratively efficient.

5.3.4 *Sustainability factors*

The last sub-theme can be considered a result of all of the above as it is the direct result of goals, targets and delivery actions. This theme is that of issues on the ground. The topics very much comprise the daily aspects of implementing the projects which have been identified and assigned to organisations to roll out and affect the sustainability of the projects.

The long-term sustainability of the Universal Service policy can be affected by a multiple of elements such as the technology, funding, competitive aspects, pricing conditions or constraints and coverage constraints (Blackman, 1995; Chone et al., 2000; Gasmi et al., 2000; Cremer et al., 2001; McElhinney, 2001; Chone et al. 2002; Hoernig and Valletti, 2002; Valletti and Hoernig, 2002; Hammond, 2005). The findings revealed that some additional factors can be added to these, in the South African context, at least.

a. *Ownership, business management and maintenance*

The projects which are rolled out in the target areas were identified to serve both the basic need of providing communication, as well as the need of promoting socio-economic development. To this end, the projects are aimed at involving users in the communities where the services are being provided, in order to run the systems and earn income from them. In the case of the Community Service Telephones and Community and Tele centres, the telephone and data services are operated by a local community member and the income generated is often their sole source of income.

The need for these individuals to therefore have the business and technical skills to operate and manage the community projects is essential to the provision of the services. While the operators will provide some support services, they cannot provide twenty-four hour seven days a week hand-holding support for any small

problem which occurs and are not responsible for ensuring the proper management of the business. As the individuals who are running these projects also tend to move on to other opportunities, there is no sustained management of the systems.

The issue of basic ICT skills and business skills also applies to other projects, such as the USALs. It was found that those who are running these operations in many cases that have little or no ICT experience. While they are often run by people with a good degree of business experience, the structure requires local ownership and involvement. As the areas, by definition, are under-serviced, the experience of ICT skills will possibly be low. Therefore the ability of these operations to succeed when there is little or no relevant experience is questionable. This lack of skills has further implications on feasibility from a financial perspective, as the sourcing of funding will be affected. The respondents from the financing sector indicated that the experience of the management and operator is a contributor to the risk profile assigned to the operator. If the requisite experience and knowledge is lacking, the risk factor will be increased and financing will be refused or very expensive. It was also highlighted, that these initiatives are usually financed through business banking and not project infrastructure type financing. This makes the financing more expensive and a personal risk to the individual.

The skills development topic has been identified before in this research. There are programmes established to provide training and this is within the mandate of USAASA. The questions still remain as to how much training has taken place and whether it was the correct training. While the research would indicate that some training has been conducted by USAASA, this has been focused very much on general ICT capacity building and supporting the tele-centres. Due to overspending on other projects, however, the objectives for this initiative have not been met.

The extent of the training into the communities such as for the schools where infrastructure has been deployed is not expansive. Private organisations like the

Internet Service Providers of South Africa (ISPSA) have conducted extensive teacher training on their own initiative, but there is no evidence of official programmes for this type of requirement. The shortage of skills on the ground was identified by the respondents as an issue which requires urgent attention to enhance the sustainability of the projects from a financial and user point of view. This indicates that while programmes do exist, their effectiveness is questionable.

As a follow-on to the basic business and technical skills, the topic of operations and maintenance is directly related. It was identified earlier in the research analysis that the refurbishment of the tele-centres and community centres features strongly within the USAASA projects which are financed by the USAF.

Apart from these projects undertaken by USAASA, no specific technical operations and maintenance initiatives aimed at the universal service systems could be identified. While the operators in general will be required to maintain the primary ICT infrastructure in terms of their network maintenance, the entire associated infrastructure, such as computers, power and related peripherals, are not included in this. The need for ongoing maintenance of the infrastructure similarly requires skills to perform such maintenance. Additionally, basic skills are required to enable accurate diagnosis of any problems to enable the primary maintenance party to assign the correct resources to conduct the maintenance. The support resources intended to be supplied through the capacity building projects would assist in this, but this project is still to be completed and will require ongoing funding as the learners will move on to better positions as their experience and skills develop.

The issue of ownership and governance related to the projects can be linked directly to the business management and technical skills required to operate the initiatives. As the actual people running the operations tend to move on to other projects or ventures as their own skills develop, there needs to be a handover process and maintained ownership within the communities.

This ownership also relates to the ownership of the assets themselves and the responsibilities of communities in terms of maintaining and ensuring the sustainability of the infrastructure. No guidelines are available for how this would be managed and for what should apply to the projects being rolled out. As there is no formal requirement for managing these systems, the community ownership remains lacking and not driven. This would also affect the supporting infrastructure required to operate the services.

The respondents also raised the issue that the infrastructure that is provided would not last long without this ownership, be it from lack of maintenance or, even worse, vandalism and theft.

5.3.5 *Conclusion*

The effectiveness of the current structures and programmes introduces a very subjective area of interpretation. The perception of success or failure will be determined by you relationship with the industry.

While there are a number of successes on individual project levels, when evaluated as a whole the current structures and programmes are not very efficient with regard to delivery on the Universal Service policy conceptual goals. The reasons for this efficiency or effectiveness failure cannot simply be ascribed to incompetence, however, which is often the emotional reaction when discussing the topic.

There is a clear misalignment of roles, functions, goals assigned to the organisations and the resources assigned to achieving them. This results in the problems experienced in delivery, which ultimately reflects on itself as an inefficient structure.

From a conceptual viewpoint, all the required elements are in place for the delivery of universal services to the population of South Africa. As with the direction, however, the practical elements do not exist in sufficient substance to support the concept.

5.4 Action steps to improve the provision of services

The suggestions for improving the provision of universal services in South Africa are largely related to the issues seen as hindrances to the current implementations. Therefore, while some elements are possibly short term in nature, there are some which may provide a long-term guideline for international reference. Each possible area for improvement is discussed separately below.

5.4.1 *Cohesive Strategy*

The lack of a cohesive strategy was identified by the majority of the respondents as a problem in the current policy and process for the delivery of services. By formulating a complete strategy for the implementation of universal services, a comprehensive policy can be formulated which will account for all the requirements and role players. The need for a vision for universal service is obvious, as there is currently no driving direction and purpose which can be clearly argued. This vision would provide not only the regulatory and support organisations with a clear long-term objective, but also align the operators with the regulator in terms of the direction they can expect decisions to take in the context of Universal Service.

A time frame over which this strategy should focus varyied from five years to twenty years according to the respondents. In light of the admittedly rapidly moving technological environment, it cannot be focused too far in the future, though. The strategy should look at what the department and government would aim to achieve in the mid-term in relation to the overall government strategy. The detailed actions of

what would be required to implement the strategy are beyond the scope of the strategy itself, as that becomes an operational aspect.

The strategy would also have to take into account other aspects of the regulatory policy which would affect the operations and delivery of services such as the envisaged licensing regime; new entrants planned, such as a third national fixed network operator; and the policy on the promotion of previously disadvantaged groups into the ICT industry. One of these groups could include the the USAL group. For this reason, the next improvement focus must be in alignment and support of strategy development.

5.4.2 *Co-operative model*

In order for the provision of universal service to be accepted and supported by the industry, the regulator body will need to adopt a co-operative model in which the plans and policies are reviewed and cognisance taken of expert opinion.

The provision of services in South Africa has largely been made the task of the network operators, both fixed and mobile. This process of utilising universal service obligations was found in the research to be something which the operators do as somewhat of a grudge. While some respondents did argue that the obligations are beneficial to the operators when run as commercial operations, the general process and requirement for implementation is a bind. Furthermore, those who are subject to the obligations, be they national telecommunications network operators or Internet Service Providers, are all at the mercy of the regulator in terms of obtaining approval for executing the projects. This, as seen in the research, is a bottleneck which has and will cause conflict and delays in the provision of services to those who need them.

By establishing a co-operative working relationship between the industry and regulatory role players, the buy-in into the decisions could be achieved, which could result in the creation of better, more beneficial programmes in which all role players will have faith. This would also assist the regulator in understanding the directions the technology and operators are planning on taking, which could support their strategy formulation and revision of the universal service policies. Additionally, the current shortcomings and challenges identified by those implementing universal services could be recognised and compensated for, thereby improving delivery in an ongoing manner.

Some respondents identified such a co-operative relationship as requiring a Public-Private Partnership type of structure. The concern was raised, however, that this may result in the responsibilities of the regulator and USAASA being pushed onto the private enterprises. The exact form of structure is therefore still to be agreed; however the requirement for an industry workshop through which to formulate this co-operative model definitely is a required next step.

5.4.3 *Driving Universal Service using commercial principles*

The implementation of any project and, even before implementation, the business cases, should always adhere to basic commercial principles when determining viability. This would encompass the market size, income of the target group; demand for the services and the cost of supplying the infrastructure and services.

It was noted in the research that the original USOs, as well as other projects aimed at universal service provisioning, did not always follow basic guidelines. According to the respondents, the business cases for the USOs were not done at the time and the lack of business and technical skills, as well as market knowledge, that were identified would furthermore suggest that the actual planning and costing may also not have been sufficient or accurate in other cases.

It was also noted that private enterprises would always focus on implementing projects on commercially viable criteria, and would not drive those projects which did not meet their criteria. The regulator would therefore have to drive these projects and would need to obtain support through the co-operative model, at least for the obligations, from the private sector.

In line with this concept, though, it is important that the full range of tools available to the regulator should be utilised. This would include assigning obligations based on market share, presence in an area, using subsidies for infrastructure and consumer use, as well as possible means of utilising creative regulators' means to reduce the costs of operating and call termination for the applicable operators so that they would be able to pass on the savings. Such an example would involve the utilisation of something such as an asymmetric Interconnect rate as shown in the diagram below.

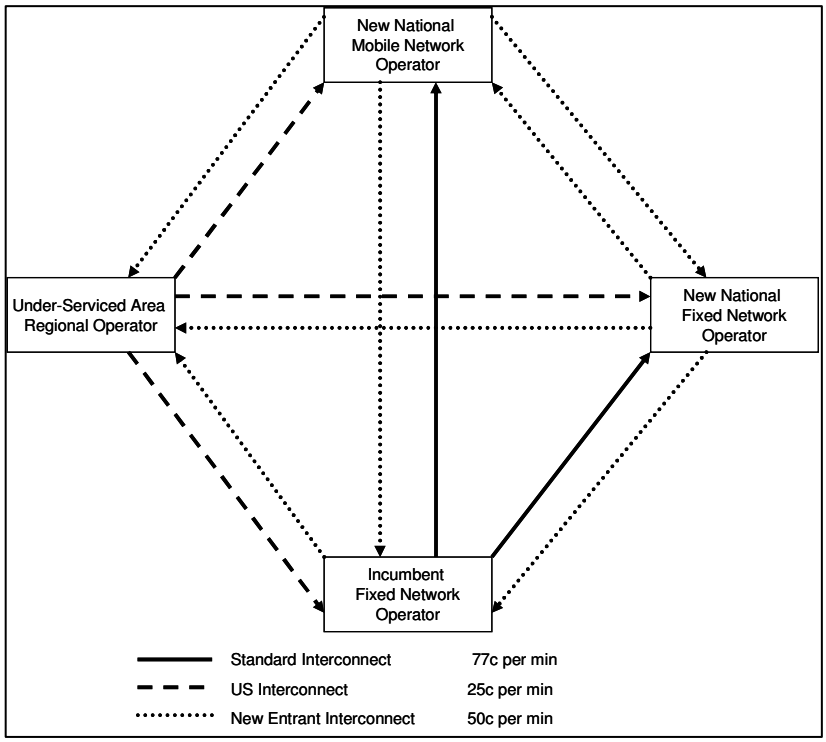


Figure 2: Example of asymmetric inter-connect concept

This concept would require differentiation of the interconnect rates, which are the charges between operators for the termination of calls in each other's networks. An asymmetric rate essentially means that the rate is different, depending on the starting and termination points. In this model, different operators would be charged a different rate depending on their relative size in the market, coverage and possibly on the area in which services are being provided. As the interconnect rate currently is one of the largest components of a call rate, this could provide a means of reducing the costs and supporting consumers and USAL type operators. The impact on the total cost of telecommunications in the country could also be positive, should this thinking be applied to the broader market.

As mentioned earlier in the analysis, the utilisation of other identified programmes such as auctions to encourage the provision of services, should also be driven by the regulator. An auction essentially requires the operators to bid to build and/or operate the infrastructure in under-serviced areas. The operator requesting the lowest subsidy in order to provide services wins the right to the area and, by definition, the consumers therein. This model provides the operator with an incentive to provide the services as cheaply as possible while still being economically profitable.

5.5 Conclusion

The above analysis has highlighted the different factors and findings which would have influenced the provision of universal service in the South African Telecommunications market. The interdependency between the different elements, from the definition through to the implementation and measuring of achievement, is evident from the overlapping of findings and their impact across themes.

In concluding the interpretation, it is important to note that the findings cannot be read in isolation and the themes, similarly, cannot be considered exhaustive when read on their own. The relation of the findings and interpretation to the research

questions requires consolidation of the themes in order to evaluate the situation in which the market finds itself.

6 CONCLUSIONS

6.1 Introduction

At the outset, this research intended to find answers to relatively basic questions which in themselves had their roots in the popular press where the topic is under constant scrutiny. During the course of the research, issues which may have seemed relatively straightforward to the “man in the street” were found to have different underlying driving forces.

While the underlying theme remains one of regulatory economics and the impact of regulation of service delivery, the outcome, in the researchers’ opinion, brought together a much broader set of management concepts, principles and issues.

6.2 Summary of the main findings

The research found that, while not formally documented, the main topic of universal service is well understood in both the regulatory and private sectors of the industry as a whole. It was also found that the common view amongst the different role players is that the needs and targets for the Universal Service policies have to look towards the converged environment of Voice and Data services.

While the topic and definitions are understood, it was found that there is a lack of impetus to drive the topic forward. This lack of impetus seemed due to a combination of a lack of direction as well as a certain amount of conflict between the different role players. It was additionally frustrated by the shortage of the appropriate skills and resources in the organisations mandated to perform this guiding and driving function.

The organisations and programmes which exist have attained different levels of effectiveness in delivering services. While the physical implementation of some projects occur quite effectively, the guidance for which projects to execute, when to implement them and who should be responsible for the execution has not been sufficient. This, in turn, resulted in the organisations, such as USAASA, taking on tasks outside of their mandate and for which they do not have the correct resources. This has a follow on effect of utilising resources, both in terms of staff and funds, which could be better utilised elsewhere.

The result of such incorrect utilisation of resources is that the organisations do not perform their legislatively mandated functions. Accordingly, while allowed for in the legislation, the international standards and accepted means of driving universal service are not applied as efficiently as they could be. This results in the further dilution of effectiveness as standard international programmes do not receive the correct focus, as in the case of the Universal Service and Access Fund.

The operators in general do not face any major challenges in the physical execution of their obligations and are sufficiently resourced to execute them. While they may in some cases consider them a bind, the roll-out targets are not particularly onerous on their operations or profitability, and these obligations are considered even more profitable than some normal business activities in certain cases. The service delivery of the operators is, however, affected by the resource and skill shortages in the regulatory environment, which delays the provision of services to the users whom the Universal Service Policy is supposed to assist.

In relation to the last research question concerning whether the correct measures have been put in place, achievement is difficult to assess. While the obligations can be measured through obtaining the information from the operators, the measurement of the success of the policy is relatively nonsensical without formal definitions and targets,. As the goals and definitions could not be determined and appear never to

have been finalised from an overall policy perspective, any measures which could be made are based on specific projects. These project by project measures, like the obligations, have been determined in relation to the targets but not to an overall policy objective.

Finally, it was found that the provision of universal service cannot operate purely on political and social intent. The basic principles of management and economics need to be applied to ensure that the direction taken and delivery towards that direction are both correct and feasible. In the case of the South African telecommunications market, the intent is very good, but the management from both strategic and operational viewpoints is very weak and unguided. The overall policy and programmes need to have clear guidance and strong effective management and support in order to deliver against their socio-economically driven aspirations.

6.3 Limitations of the research

This research was limited in the sense that it did not look at the actual cost of providing services. The research was intended to evaluate the situation in the market from an overall qualitative perspective and not directly from a quantitative perspective, therefore some of the delivery figures may be slightly outdated.

A further limitation imposed on the research concerned the availability of secondary information, particularly with regard to roll-out projects. Such information is not freely available in the public domain and, while it was requested from different respondents, was not always formally available. Furthermore, delays concerning the publishing of government reports resulted in some of the secondary documentation that was obtained possibly being slightly outdated.

These limitations do not, however, impact on the conclusions drawn from the research findings, as the degree of variation, according to discussions with the relevant respondents, indicated that the roll-out quantities and other information contained in the relevant documentation were not so significantly different that it constituted major discrepancies.

6.4 Recommendations

The recommendations for the improvement of delivery, which was the intention of the second sub-problem, were highlighted in the interpretation of the findings, but are summarised here for reference.

The first recommendation is that an overall strategy for the provision of universal service in telecommunications should be established. Such a strategy will need to provide the definitions, strategic targets and the high-level plans to achieve these goals. A vision is needed towards which to strive.

Secondly, there should be a co-operative approach within the industry between the regulatory and private sectors, not only while developing the strategy, but on an ongoing basis. Autocratic dictation of obligations and programmes will only create animosity between the parties and result in resistance and infighting, which will delay the provision of services to those who need them most.

The third recommendation was that the overall strategy and the delivery programmes that are set up must always bear the basic economic or commercial criteria in mind. While there will probably be a certain number of totally uneconomical projects, the objective should be to apply the most effective technology, programmes and mechanisms to make the projects as feasible and sustainable as possible. This

should be considered from both the regulatory and operator perspectives when evaluating projects and building business cases.

Lastly, an overriding recommendation that can be made from this research is that public policy and interest programmes should not ignore the basics of business management. While policy objectives and programmes may have socio-economic and political will behind them, the implementation must be planned and resourced correctly. Good intent alone cannot drive the provision of services. The practical aspects have to be set up in such a way as to facilitate the process. This is one of the contributions from this research that is expected to have added to the theory on the regulation and implementation of universal service policy.

6.5 Suggestions for further research

The dynamic nature of the telecommunications industry by definition would result in some of the findings of this research possibly being out of date shortly after the time of writing. For this reason, there would always be room for further research on the topic of universal service. Areas for further research would comprise qualitative as well as quantitative subject matter.

Some suggestions that the researcher can make would relate to:

- The impact of the new licences issued in terms of the Electronic Communications Act
- Feasibility study of the Under-Serviced Area Licence and Provincial Under-Serviced Area Network Operator licences
- The implications of anti-terrorism legislation on universal service provisioning

- The differing requirements of universal service between developed and developing economies

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APPENDIX A

Interview Sample

Name	Organisation	Division/Designation
Operators		
Nobuhle Chonco	Vodacom (Pty) Ltd	Community Services
Harri Rauhala	Cell C (Pty) Ltd	Chief Strategy Officer
Graeme de Vries	MTN (Pty) Ltd	GM: Regulatory Affairs
Dr Angus Hay	Neotel (Pty) Ltd	Executive Head - Strategy
Siyabonga Madyibi	Internet Solutions (Pty) Ltd	Regulatory Director
Regulatory		
Zolisa Masiza	Independent Communications Authority of South Africa	Councillor
James Theledi	Universal Service and Access Agency of South Africa	Chief Executive Officer
Trevor Nivi	Universal Service and Access Agency of South Africa	Manager Research
Independent		
Iain Macauley	Nedbank Project and Infrastructure Finance	Specialised Finance
Kudzayi Hove	ECP Private Equity	Vice President
Edwin Thompson	Communication Users Association of South Africa	Chairman
Brian Adams	Icon Corporation (Pty) Ltd	Director

APPENDIX B

Sample Questionnaire for MBA Research Interview

Name of Interviewee: _____

Organisation: _____

Role/Designation: _____

Permission to record Interview for consistency: ☐ Yes ☐ No

Request for Copy of Research or Abstract: ☐ Yes ☐ No

Business Card obtained for Thank you Note: ☐ Yes ☐ No

Question 1

Generically, what do you understand universal service and access to be?

_____

_____

_____

Question 2

What do you see as the Universal Service needs in South Africa? Market, Services, Access etc. (Who, where and what)?

_____

_____

_____

Is there a need to have a dual focus for the 1st & 2nd Economies? Voice & Data vs Voice to start and build services from there?

_____

_____

_____

Question 3

How effectively are these needs being addressed within the current framework?

a. Universal Service & Access Agency Programs eg., Telecentres, E-School cyber labs, Community centres etc

_____

_____

_____

b. Universal Service Fund

_____

_____

_____

c. Universal Service Obligations for Operators

_____

_____

_____

d. USAL concept

_____

_____

_____

e. Are there any other initiatives which you know of?

_____

_____

_____

Question 4

What are the challenges currently facing the provision of universal service from a regulatory and an operator perspective?

_____

_____

_____

Question 5

How do you think these challenges could be overcome?

_____

_____

_____

Question 6

What alternative approaches/models would you recommend to motivate/drive the provision of access to communications infrastructure and services in the country?

a. Organisational / regulatory structures

_____

_____

_____

b. Funding mechanisms

_____

_____

_____

c. Management, Control and measurement

_____

_____

_____

d. Pricing & costing structures

_____

_____

_____

Question 7

What would be an effective means of measuring and managing the provision of access/services?

☐ Teledensity

☐ Connectivity Quality

☐ Bandwidth

☐ Cost of Services

☐ Cost to Operators

☐ Managing non-delivery/non-conformance

_____

_____

_____

☐ Other Suggestions

_____

_____

_____

Question 8

Are there any other specific issues or suggestions you would like to mention which should be considered when evaluating universal service delivery and implementation.

_____

_____

_____

APPENDIX C

Consistency Matrix

The purpose of this research is to determine the extent to which goals of the Universal Service policies have been attained and to establish what types of additional or alternative models and initiatives should be investigated to encourage the expansion of communications services for the attainment of the Universal Service delivery targets.					
Sub-problem	**Hypotheses/Propositions/Research questions**	**Source of theory**	**Source of data**	**Type of data**	**Analysis**
The first sub-problem is to determine the extent to which the goals of the Universal Service policy have been achieved and the possible reasons for any deviations from them.	Research Question 1: What are the goals which are to be achieved under the banner of universal service in South Africa in terms of the target markets and services which will be supplied?	(Blackman 1995; Mueller 1997; Xavier 1997; Milne 1998; Peha 1999; Chone et al. 2000; Intven et al. 2000; Sawhney 2000; Cremer et al. 2001; Bhuiyan 2004; Shanmugavelan and Warnock 2004; Hammond 2005; Senge 2006)	Secondary Data research on the policy, structure and goals for the provision of universal service in South Africa One on one interview with network operators, strategists, consultants and policy makers.	Primary and Secondary	Interpretive analysis and in-depth Interviews

The purpose of this research is to determine the extent to which goals of the Universal Service policies have been attained and to establish what types of additional or alternative models and initiatives should be investigated to encourage the expansion of communications services for the attainment of the Universal Service delivery targets.					
Sub-problem	**Hypotheses/Propositions/Research questions**	**Source of theory**	**Source of data**	**Type of data**	**Analysis**
	Research Question 2: Are the existing structures and processes put in place for the provision of Universal services in South Africa, suitable for the effective delivery of the services?	(Blackman 1995; Milne 1998; Barros and Seabra 1999; Weller 1999; Chone et al. 2000; Frieden 2000; Gasmi et al. 2000; Gonenc et al. 2000; Intven et al. 2000; Panzar 2000; Cremer et al. 2001; Gonenc et al. 2001; McElhinney 2001; Chone et al. 2002; Hoernig and Valletti 2002; Valletti and Hoernig 2002; Chhibber 2004; Hodge 2004; Ramos 2006; Senge 2006).	Secondary Data research on the policy, structure and goals for the provision of universal service in South Africa. One on one interview with network operators, strategists, consultants and policy makers.	Primary and Secondary www.usaasa.org.za www.icasa.org.za www.doc.gov.za	Interpretive analysis and in-depth Interviews
	Research Question 4: In relation to the implementation of universal service in South Africa, have the correct targets and executions against those targets been measured when evaluating the success of Universal Service and the USAASA in South Africa?				

The purpose of this research is to determine the extent to which goals of the Universal Service policies have been attained and to establish what types of additional or alternative models and initiatives should be investigated to encourage the expansion of communications services for the attainment of the Universal Service delivery targets.					
Sub-problem	**Hypotheses/Propositions/Research questions**	**Source of theory**	**Source of data**	**Type of data**	**Analysis**
The second sub-problem is to establish what additional or alternative models and initiatives should be investigated to encourage the expansion of communications services for the attainment of Universal Service delivery targets.	Research Question 2: Are the existing structures and processes put in place for the provision of Universal services in South Africa, suitable for the effective delivery of the services?	(Blackman 1995; Gasmi et al. 2000; Gonenc et al. 2000; Intven et al. 2000; Panzar 2000; Gonenc et al. 2001; Hoernig and Valletti 2002; Valletti and Hoernig 2002; Oestmann 2003; Ramos 2006)	Secondary Data research on the policy, structure and goals for the provision of universal service in South Africa. In depth interviews will also contribute to this section of the research to confirm the validity and feasibility of the findings.	Secondary documentary data including the press and below websites as examples. www.usaasa.org.za www.icasa.org.za www.doc.gov.za In-depth interview transcripts and recordings.	Analytical & Interpretive

The purpose of this research is to determine the extent to which goals of the Universal Service policies have been attained and to establish what types of additional or alternative models and initiatives should be investigated to encourage the expansion of communications services for the attainment of the Universal Service delivery targets.					
Sub-problem	**Hypotheses/Propositions/Research questions**	**Source of theory**	**Source of data**	**Type of data**	**Analysis**
	Research Question 3: How are the different operators addressing the challenges of providing services aligned to the universal service policies and targets?	(Blackman 1995; Peha 1999; Chone et al. 2000; Gasmi et al. 2000; Cremer et al. 2001; Chone et al. 2002; Valletti and Hoernig 2002; Oestmann 2003; Hodge 2004; Hammond 2005; Ramos 2006)	Secondary data sources such as internet and the press. One on one interview with network operators, strategists, consultants and policy makers.	Secondary data based on market reports, news articles etc. Primary source will be the outcome of the in-depth interviews with relevant organisations.	Text data analysis and In Depth Interview analysis
	Research Question 4: In relation to the implementation of universal service in South Africa, have the correct targets and executions against those targets been measured when evaluating the success of Universal Service and the USAASA in South Africa?	(Mueller 1997; Chone et al. 2000; Gasmi et al. 2000; Rosston and Wimmer 2000; Cremer et al. 2001; Chone et al. 2002; Valletti and Hoernig 2002; Oestmann 2003; Hodge 2004; Shanmugavelan and Warnock 2004; Hammond 2005; Mochiko 2006a; Ramos 2006)	One on one interview with network operators, strategists, consultants and policy makers.	Primary Interview transcripts and notes.	Common theme analysis and interpretation