

THE DEVELOPMENT OF A NEW TELECOMMUNICATIONS POLICY FRAMEWORK FOR AN EMERGING KNOWLEDGE SOCIETY

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1. Background

Innovation is the introduction of new and/or improved products, services and processes; and is the main driving force behind a nation's economic development and improvement of competitiveness of its firms. The South African Innovation Survey 2001 (SAIS 2000 [1]) is the first comprehensive innovation survey conducted in South Africa by the University of Pretoria, in close collaboration with the Eindhoven University of Technology in the Netherlands. The survey was modelled on the European Community Innovation Surveys (CIS) conducted in EU since 1994.

The purpose of the survey was (a) to get a representative nationwide overview of the innovative behaviour and the performance of South African firms in manufacturing and services for the period 1998-2000; (b) to benchmark the innovative behaviour of South African firms with the innovative behaviour of firms located in Europe Community; and (c) to formulate policy recommendations for the key role players in South African System of Innovation.

The survey found that about 58% of all firms were manufacturing firms whereas 23% were service providers and 19% of the firms were involved in wholesale activities. The majority of the firms were small and medium-sized organisations.

About 44% of South African firms had technological innovations in the period 1998-2000. This figure is surprisingly high as it is comparable to that of many developed countries in Europe. The majority of innovations of South African firms were incremental and larger firms had higher innovation rates than smaller firms.

This paper therefore aims to concentrate on part (c) of the purpose of SAIS 2000 i.e. to formulate policy framework for an emerging knowledge Society. The SAIS 2000 had a policy recommendation that “The proven ability of local firms to improve products and processes using foreign technology should be encouraged, supported and strengthened. Furthermore, the transfer, assimilation and diffusion of technology should receive high priority.” Thus the need for the development of a new telecommunications policy framework to match the innovations in telecommunications sector.

2. Literature Review: Theoretical Background

2.1 Introduction

Fanie Cloete *et al* [2] defines policy framework as a written or unwritten constitution that spells out broad principles and/or values that will enable policy-makers to set up guidelines and procedures for the management of public affairs.

Bauer [3] defines Telecommunications policy as:

“decisions made by the governments in consultation with various stakeholders including business, labour and civil society, about how telecommunications systems will be operated and regulated in a country. In addition to the rules, telecommunications policy consists of a ‘complex set of discretionary public policy actions’ which affect the evolution of the telecommunications sector”

2.2 Globalisation

The main characteristics of globalisation since the 1980s can be summarised in terms of impacts relating to the emergence of a global system, global competition, the location, organisation and rationalisation of economic activity. The main driver of the emerging knowledge economy is the rapid globalisation of economic activities. While there have been other periods of relative openness in the world economy, the pace and extent of the current phase of globalisation is without precedent. The global communications revolution has been accompanied by a widespread movement to economic deregulation

2.3 Information Society and Information Economy

As a consequence of technology and information, Braman [4] suggests that the information society is constructed from a set of *things* or products, *processes* and *effects*. For example, the information society is equated with specific *products* or *commodities* that can be purchased, such as a cellular telephone or computer, and the purchase of such a product implies that one buys the information society. Another conception of the information society as a thing is seen in considering the information society as a set of government policies on the introduction and use of information technologies. As a process there is an “informatisation” of society whereby information activities are becoming dominant.

The fast development of Information and Communication Technology (ICT) has brought about deep **changes in our way of working and living**, as the widespread diffusion of ICT is accompanied by organisational, commercial, social and legal innovations. Our society is now defined as either the "**Information Society**", a society in which low-cost information and ICT are in general use, or as the "**Knowledge(-based) Society**", to stress the fact that the most valuable asset is investment in intangible, human and social capital and that the key factors are knowledge and creativity.

By analysing the different information society initiatives around the world Webster [5], Ducatel and Herrmann [6] distinguish two waves in the Information Society debate:

- The first wave that commenced in early 1980s and lasted to the beginning of 1990s was associated with an anticipated "ICT revolution," which was expected to lead to convergence of television and telecommunications. This led to a focus on deregulation and the network infrastructure to technology development initiatives, such as the Japanese Fifth Generation Project and the European RACE, ACTA, and ESPRIT Programs.
- The second wave was launched during the 1991-2 US presidential elections when Al Gore promoted the National Information Infrastructure as the key to the future. The second wave focused on competitiveness, economic growth, access, regulation, privacy, security and intellectual property rights. The key difference to the first wave was the emerging concern about the information haves and have-nots. Ducatel, as quoted by Webster [4], stated that the second wave spread

rapidly around the world, and quickly found itself surfing on an even bigger wave, the Internet.

Ducatel and his colleagues [6], represent an emerging third wave:

- The relationship between technological change and social transformation is now acknowledged to be a complex one, and the simple notion of technological changes having social effects, which in turn can be simply controlled by appropriate policies, has now been shown to be false. This brings an added complexity to policy making. It is not enough to develop and implement appropriate technology policies in isolation. Technology policies and social policies have to be developed in a complimentary way to strive for complimentary objectives. It is therefore necessary and sufficient to develop a more sophisticated appreciation of these social issues. (Webster [5]).

2.4 Knowledge Economy and Knowledge Society

Rapidly growing economies depend more on the creation, acquisition, distribution, and use of knowledge. The effective use of knowledge is becoming the most important factor for international competitiveness; and for creating wealth and improving social welfare. The four pillars of a knowledge-based economy are:

- An economic and institutional regime that provides incentives for the efficient use of existing knowledge, the creation of new knowledge, and entrepreneurship.
- An educated and skilled populace that can create and use knowledge.
- A dynamic information infrastructure that can facilitate the effective communication, dissemination, and processing of information.
- An effective innovation system comprising a network of firms, research centers, universities, think tanks, consultants, and other organizations that can tap into the growing stock of global knowledge, assimilate and adapt it to local needs, and create new knowledge or technologies.

2.5 Neo-Classical Production Theory

In his paper, 'Interactions in knowledge systems: foundations, policy implications and empirical methods', Keith Smith (1995) [7] discussed the differences between the characteristics of technological knowledge in neo-classical production theory and modern innovation theory. Neo-classical production theory rests on an implied and implicit form of technological knowledge with very specific characteristics. Smith (1995: 75) argues that in a neo-classical world, technological knowledge must have the following features in order for the production theory to hold:

- It is generic: An item of knowledge can be applied widely among firms and even among industries;
- It is codified: Transmitability implies that knowledge is written or otherwise recorded in fairly usable form;
- It is costlessly accessible: transmission costs are negligible, or firms are not faced with differential costs barriers to obtain knowledge and bringing it into production;
- It is context independent: firms have equal competences in transforming knowledge into production capabilities.

2.6 Modern Innovation Theory

Modern innovation theory emphasises different aspects of technological knowledge, and hence provides a different view on the issue of technological knowledge and innovation. Clearly all firms operate with some kind of technological knowledge base. This is not a unitary base, and it often consists of three areas of production-relevant knowledge, with different levels of specificity. Firstly, there is the general scientific knowledge base. This base is highly differentiated internally and of widely varying relevance for industrial production. Some fields, such as molecular biology, solid-state physics or inorganic chemistry, have close relationships with important industrial sectors. In other words, this knowledge base often has close connections with science.

Secondly, there are knowledge bases at the level of the industry or product field. Industries often share particular scientific and technological parameters,

understandings of technical functions, performance characteristics, use of materials and so on, of products.

Thirdly, within these technological parameters, the knowledge bases of specific firms are highly localised. Most firms understand one or a few technologies well and they form the basis of their competitive position. The highly specific features of these knowledge bases are not only technical. It also concerns the way in which technical processes can be integrated with skills, production routines, use of equipment and so on. These knowledge bases may be informal and tacit, taking the form of skills embodied in individuals or in groups of cooperating individuals or organisations. The tacit and localised characteristics of firm-level knowledge imply that although individual firms may be highly competent in specific areas, this competence is limited.

This means, firstly, that firm's innovation processes can be problematic when technological innovations ask for competences, which lie outside the area of competences of the firm. Secondly, that the ability to carry out search processes relevant to problems can also be limited. As a result, firms must be able to access and use knowledge from outside the area of the firm when creating technologies and technological innovations. (SAIS 2000, [1])

2.7 The Democratic Theory

According to the democratic theory, policy making should be a public process in which the widest possible range of views may be expressed in the form of legislation. Boeringer [8]), argues that the integrative democracy has been highlighted as the concept of policy making, and that telecommunications success correlates with political stability. The existence of open and widespread public and parliamentary, debate guarantees the political legitimacy of the policy directives that are formally expressed in legislation. Thus public involvement gives electorates opportunities to express their views on telecommunications issues affecting their lives

2.8 The Pluralist Theory

Pluralist theorists embrace the democratic ideal, where a spectrum of participants are involved in policy formulation processes. Participants include political parties or pressure groups, the state, trade unions, private industries, non-governmental organisations and other civic organisations. Pluralist support and value diversity because, they believe that diverse participation ensures that no group can have systematic power over decision-making processes.

Boeringer [8] argues that policy making in the More Developed Countries - MDCs is not a grassroots process but is rather dominated by political and economic elites who have the interest and possess the resources to set and control the policy agenda and thus policy might reflect the aspirations of a few elites interested in maintaining the status quo.

2.9 The Corporatist Theory

Braman [3] maintains that "corporatism" emerged in the early 20th century as a collaborative decision-making arrangement includes government, business and labour. Corporatist theorists embrace the idea that power and authority in the policy-formulation process are vested in particular groups, namely labour, business and the state.

Mosco [7] similarly describes corporatism as increasing the control powers of the state. According to Mosco *et al*, the corporatist mode gives authority to individuals who represent specific components of economic division of labour, particularly different sectors of business. Furthermore, depending on the power of labour and consumer interests, these groups may play a role, typically secondary, in the corporate system. It is believed that corporatism vests authority directly in a body that reflects what the state defines as legitimate and forces all interested claimants or participants to communicate their demands through this official body. In the case of the South African telecommunication policy formulation process, the issue of ownership, investment and financing was defined by the National Framework Agreement between government and labour in 1997 (SA Government [8]).

Braman [3] argues that in the current environment the distinction between public and private sector activity is not obvious. Privatisation of many former public domains of power and the growing power of trans-national and multinational corporations, vis-à-vis the nation state, have led to a situation in which private sector decisions often have as much or more structural effect than those of the public sector do. Formal policy-making structures are beginning to evolve that bring public and private sector representatives together in new collaboration ventures.

2.10 The Political Economy Theory

Political economic theorists claim that fundamental political and economic issues exist which influence policy-making and that there is always an interaction between politics and economics when decisions are made. Political economic theorists believe that there are people who, with their particular interests and ideologies, set an agenda and what they include and exclude is fundamental to policy making. Capitalist power originates in ownership. This power expands through diversification and mergers. By expanding their power base, capitalists are able to exert their influence on government.

2.11 Realism/Realpolitik

Meaning some (countries) dominate others, and use power (economic and / or political) over others - to pursue self-interests. States are the principal, unitary and rational actors in international actors and national security is each states' top priority Viotti [10]. Neo-realism proponents Zacher and Sutton [11] provide the central these of the neo-realism concerning international co-operation. They state that "there are significant obstacles to the development of international regimes and that when the regimes are created, they rest on interests and the power of a hegemonic power or group of powerful states".

2.12 Integration Theory (Pluralism and interdependence)

According to Masco *et al.* Pluralist believe that non-stat actors are important entities in the International Relations that can not be ignored. Looks at flexibility within these

bodies - has liberal views, works towards integration but not very practical. The theory emphasises the global policy development of the world, but saying that globalisation is not a one way street from developed to the under-developed countries, but it must be vice versa. Even promoting that non-state organisations like churches should be part of discussions - as these form part of the values holding the government together. The government should not be the only body when developing policy - the approach is pluralistic

2.13 World System Theory

The World System Theory (WST), advanced by Wallerstein [12] argues that the modern world (including the international telecommunications network) can be understood by an analysis of the world economy. The WST belongs to a perspective known as Globalism who base theory on four assumptions:

- They emphasise that the global context within which states and other entities interact should be the starting point analysis.
- The study of countries could be replaced by the study of the world economy in which the states are its interrelated parts.
- Globalists are concerned with the development and maintenance of dependency relations among the industrialised countries and the poor LDCs.
- Globalists argues for the critical importance of economic factors when explaining International Relations dynamics, and subordinate political issues to the economic ones.

2.14 Competition Theory: ME Porter

Competition is a process expressed as rivalrous market behaviour between different businesses and takes many forms. Economic theorists stipulate that effective competition requires that prices should not be fixed, but should rather shift with forces of demand and supply. According to Porter [13], in any industry, whether domestic or international or whether it produces a product or a service, the rules of competition are embodied in the five competitive forces: a) the entry of new competitors, b) the threat of substitutes, c) the bargaining power of buyers, c) the bargaining power of suppliers and d) the rivalry among existing competition." These competitive forces determine industry profitability because they influence the price, cost, and required

investment of firms in an industry. Therefore competitive strategy does not only respond to the environment but also attempts to shape that environment.

3. Literature Review: Models and Methods

3.1 Håkansson's Economic Model

The economic network approach, especially as developed by Håkansson (1987, 1989, 1992, 1993, [14]) and Håkansson & Snehota (1995) [15], provides us with a model to analyse technological innovation. The approach can be considered as a clear example of a modern innovation theory in which Smith's ideas can be recognised. Håkansson's economic network model contains three main elements: actors, activities, and resources. *Actors* perform activities and possess or control resources. They have a certain, but limited, knowledge of the resources they use and the activities they perform. Their main goal is to increase their control of the network. Actors in networks can be studied at different levels, from individuals to groups of firms. Two main types of *activities* are distinguished in the network model: transformation and transaction activities. Both are related to resources because they change (transform) or exchange (transact) resources through the use of other resources. Transformation activities are performed by one actor and are characterized by the fact that a resource is improved by combining it with other resources (like in production or innovation). Transaction activities link the transformation activities of the different actors. These exchanges result in the development of economic (network) relations between actors.

3.2 Rational Comprehensive Model

This is one of the most popular approaches to determine the most appropriate policy options. According to Hanekom (1987):82 [16]) it has its roots in the rational-comprehensive decision-making model and implies that the policy-maker has a full range of policy options to choose from. In this context the policy analyst should know all the value preferences of a particular society or community and their relevant importance; identify and analyse all possible policy alternatives including specific frameworks relevant to a particular discipline; explorer the possible consequences of

each alternative; and select a range of options that will bring about the desired outcome. Dye (1987: 31) [17] regards rationalism as an effort to achieve maximum social gain.

3.3 Incremental Model

This model was first developed by Charles Lindblom Kramer (1973: 123-141, [18]); and postulates that a limited number of policy alternatives are available in an incremental fashion. This view is supported by Dye (1987: 36-38 [17]); and Henry (1975: 235 – 236, [19]). The incremental model regards policy as the continuation of existing government activities with the potential for small, incremental adoption only. The assumption is that rational and comprehensive change is difficult to realise because of, among other things, vested interests and impossibility of obtaining full and adequate data on all aspects of policy. Proponents of this model argue that incremental change is more expeditious than comprehensive change; that the potential for conflict is considerably lower than with radical change and that incremental adaptation contributes to a redefinition of policy on a continuous basis

3.4 Mixed Scanning Model

This model was developed as an alternative to the above two by Amitai Etzioni and supported by Anderson (1979: 12-13, [20]) and Kramer (1973: 142-155), Kramer (1981: 245-246) [21]. Users of the mixed scanning model integrate the good characteristics of the rational comprehensive model with those of the incremental model, first by reviewing the overall policy and second by concentrating on a specific need, policy result or policy impact.

3.5 Elite/Mass Model

This model is based on the assumption that a small, elite group (usually government) is solely responsible for policy decisions and that this group governs an ill-informed public (the masses). Policy decisions made by the elite flow downward to the population at large and are executed by the bureaucracy. Henry (1992: 288, [19]) suggests that the emphasis represented by the elite/mass model may be among the most germane to the public administrators; and in addition, public administrators are increasingly perceived less as “servants of the people” more as “the establishment”. In

outline, the model contends that policy-making and policy-executing elite is able to act in an environment characterised by apathy and information distortion, and thereby to govern a largely passive mass of people. Therefore, this model sees society as divided into those who have the power and those who do not. Elites share common values that differentiates them from the mass, and prevailing public policies reflect elite values, which are dedicated to preserving the status quo.

This model is based on the assumption that the elite is firmly in power, that they know best and that the consensus on policy exists within the elite group. Clearly, this implies that the values and interests of the elite are of primary importance. This assumption can also be applied at the organisational level in the private and non-governmental sectors. The above description of the role of elite in the policy process is often oversimplified: recent literature and experience show that “the masses” are not necessarily passive and ill-informed, and that the elite may play a pivotal role in policy making and act as a dynamic catalyst for policy change. F.Cloete *et al.* (2001: 35, [2]).

3.6 The Group Model

One of the main agents for policy change is the initiative by interest groups to pressure and interact with the policy-makers on preferences and self-interests. Several different interest groups are usually involved, and an equal measure of prestige and influence for each would result. This model has a particular implications for political decisions and those at organisational levels.

Hypothetically, the outcome of public policy is representative of an equilibrium reached in the struggle between groups. The model further assumes that policy-makers are sensitive to the demands of interest groups. Its particular value lies therein that it allows policy analyst to analyse policy-making processes in terms of the demands of the participating groups. Policy analysts can therefore concentrate on the role of interest groups in the policy-making process when initiating and adapting policy.

Henry (1992: 289-290) points out that in these days of questionable campaign contributions and powerful vested interests, the notion of pressure groups and lobbying is highly relevant. He further describes the group model as “hydraulic thesis”, in which the policy is seen as a system of forces and pressures acting upon and reacting to one another in the formulation of public policy. The model is usually associated with legislature rather than the bureaucracy, but it has also long been influenced by pressure groups. Lastly, he points out that bureaucracies, particularly in regulatory agencies, seldom encounter the counter-vailing pressures.

3.7 The Institutional Model

The classical interpretation premise of this model is that public policy is the product of public institutions. Proponents of this model argue that as public is legitimised by the government, and only government policies apply to all members of society, the structure of governmental institutions can have an important bearing on policy results: Anderson, (1979: 21-23; Dye, 1978: 20-23); Hanekom, (1987: 81, [16]). According to this view, changing merely the structure of the governmental institutions will not bring about dramatic changes in policy. The relationship between the structure and the policy should always be taken into account.

According to Anderson et. al, the institutional model could be usefully employed in policy analysis by analysing the behaviour patterns of different public institutions, for example the legislature vs. the executive, and their effect on policy-making. Henry et. al. speaks of the traditional institutionalist model which focuses on the organisation chart of the government and described the arrangements and official duties of bureaus and departments, but customarily ignored the linkages between such units.

3.8 The Social Interaction Model

A range of decision-making models that are particularly useful in problem-solving process has emerged (Dbnick & Bardes, 1983: 197, [22]). Models for general participation, negotiation, mediation and conflict resolution have proved to be very relevant to policy processes (Fisher, 1991, [23]). The theory and practice of negotiations provide a framework for decision-making on policy. This has been particularly true of constitutional negotiations in South Africa. Hanekom (1986: 46,

[15]) refers to other applications of the model when he speaks of the descriptive models (which explain the causes and results of a specific policy), normative models (which imply that in addition to explanations or predictions, rules should be provided to attain a specific goal) and verbal models (which refer to everyday language, for instance, an announcement by a state president).

3.9 The System Model

The systems model or approach is regarded as one of the most valuable tools for the purposes of policy analysis. Wissink [24] notes that the idea of policy as a process is closely linked to the idea of a political system (Fox, 1991: 31, [25]). This model is especially helpful in portraying policy processes on a general and simplistic level and often identifies major subsystems and processes. Wissink, most accurately describes the policy-making process as a political sub-process within wider policy process. The former is regarded as that which typically takes place within the bounds of the political arena, and the latter as a broader sphere which includes implementation, results and evaluations.

The systems model provides a particularly valuable framework for policy-making. Easton's work on systems analysis, the high point of his contribution, shows that analysis of political systems sheds much light on political dynamics and their impact on policy-making (Easton, 1965, [26]). Wissink notes that the value of the systems model also lies in the framework that it provides, which describes the relationship between the demands, the political system and the results or outputs in terms of stabilising the environment or triggering new demands. He further notes that the systems approach stresses the cyclical nature of policy-making, as opposed to other models which see it as a start-stop sequential process

3.10 Policy Network and Community Model

Policy decisions are not always taken by a single decision-maker, but are frequently the outcomes of negotiations between network of policy stakeholders in different policy communities which may operate either inside or outside the public sector (Howlett & Ramesh, 1995: 122, [27]; Bogason & Toonen, 1998, [28]; Borzel, 1998,

[29]). These networks may be formalised institutions, but they may also be formal and ad hoc.

This approach to policy decision-making amounts to an expansion of basic systems model to a higher level, combining it with some elements of the group competition and social interaction models. It is more holistic than some of the earlier, more narrowly focused models like the elite, institutional and group models, and presents a more accurate perspective of contemporary policy processes.

3.11 Chaos, Complexity and Quantum Models

Recent advances in natural sciences, especially in the field of physics, have resulted in new theories of complex systems (Overman, 1996, [30]) These approaches are all based on the assumption that in real life, systems are mostly in disequilibrium, and not in equilibrium as traditional systems theory has it. Applied to policy systems, the assumption is that policy stability is in most cases an important objective that is not always achieved, and not the status quo that policy-makers try to maintain. This departure point has many far-reaching implications for the understanding of public policy, policy process and policy frameworks.

3.12 Functional Policy stages/phases Model

Hogwood & Gunn (1984: 4, [31]) have found it useful to analyse the policy process in terms of a number of stages through which a policy issue may pass: deciding to decide (issue search or agenda-setting, deciding how to decide or issue filtration); issue definition; forecasting; setting objectives and priorities; options analysis; policy implementation, monitoring and control; evaluation and review; and policy maintenance, succession or termination. They emphasise that this framework provides an aid to understanding how different kinds of analysis can be brought to bear at different stages of policy process, and stress that what is being advocated is not a simple-minded carry-out analysis where one step follows the next. The interactive nature of policy process is an important principle. Mutahaba (1993: 49, [32]) have put forward a most useful model. These African authors follow a macro-approach and place a significant emphasis on institutional factors. Although they acknowledge the

complexities of policy processes, they successfully reduce the process to three stages: policy formulation; policy implementation and monitoring and evaluation.

Mutahaba et. al. regard policy formulation as encompassing problem identification, data and information generation and analysis, and decision-making. Policy implementation includes coordinating, communicating, organising, planning, staffing and executing. Monitoring and evaluation consists of the determination of information needs, the generation of information, the transmission of information, assimilation analysis and assessment, and feedback to policy formulation. The importance of the institutional focus on policy-making process is clear when Mutahaba note that the effectiveness of the policy process is dependent on upon the interrelationship between functions, organisations and capacities.

4. Research Methodology and Philosophy

4.1 Research Questions

1. What level of usage of the information and communications technologies determine whether one is in information or knowledge society?
2. What innovative activities in telecommunications influence the adoption of information and communication technologies?
3. How can we formulate appropriate policies within the socio-political and economic dimensions to satisfy all the parties involved in the telecommunications industry?
4. What Telecommunication policy issues offer the best services to an emerging Knowledge Society?

4.2 Research Objectives

1. To establish what level of ICT usage determines Information Society or Knowledge Society
2. To establish the technological, social, economic and political factors affecting innovation in telecommunications policy processes.

3. To do a Policy Analysis of the existing telecommunications policy processes and propose ways of technological innovations
4. To develop a new framework using concepts, models, theories for the formulation of a telecommunications policy for an emerging knowledge society.

4.3 Research Hypotheses and Propositions

Proposition 1: Information Society and Knowledge Society are based on the extend and use of ICT's respectively which in turn is a consequence of innovation.

Hypothesis 1: The availability and usage of ICTs determine whether or not a society can be classified as an Information Society or Knowledge Society

Proposition 2: Telecommunications Policy Formulation is affected by technological, economic, social and political factors.

Hypothesis 2: Political, Economic, Social and Technological factors have a direct effect on Telecommunications Policy formulation

Proposition 3: The two drivers of the technological innovations in Telecommunications are Universal Service and Quality of Service.

Hypothesis 3: Universal Service Obligation and Quality of Service drive the development of Telecommunications Technology.

Proposition 4: Existing Telecommunications Policies need improvement to catch up with innovations in Telecommunications Technology.

Hypothesis 4: In an emerging knowledge society, telecommunications policy and regulatory institutions require a more robust framework in order to match innovations in Telecommunications Technology.

4.4 Research Philosophy

“Policy research is defined as the process of conducting research on, or analysis of a fundamental social problem in order to provide the policymakers with pragmatic, action-oriented recommendations for alleviating the problem” (Majchrzak, 1987: 12, [33])

These characteristics are that policy research:

- a) is multidimensional in focus:
- b) uses an empirico-inductive research orientation
- c) incorporates the future as well as the past
- d) responds to study users or stake-holders
- e) explicitly incorporates values

4.5 Research Procedure: The Delphi Technique

The Delphi research technique was developed in the 1950s by two research scientists working at The Rand Corporation (Olaf Helmer and Norman Dalkey, [34]). They developed the procedure as a tool for forecasting future events using a series of intensive questionnaires interspersed with controlled-opinion feedback (Dalkey [34]).

The Delphi Technique begins with an open-ended questionnaire that is given to a panel of selected experts to solicit specific information about a subject or content area. In subsequent rounds of the procedure, participants rate the relative importance of individual items and also make changes to the phrasing or substance of the items. Through a series of rounds (typically three), the process is designed to yield consensus.

4.5.1 Selection of the Delphi Method

Linstone and Turoff suggest that the Delphi procedure should be considered for research problems when one or more of the following conditions apply:

- The problem does not lend itself to precise analytical techniques but can benefit from subjective judgments on a collective basis

- The individuals needed to contribute to the examination of a broad or complex problem have no history of adequate communication and may represent diverse backgrounds with respect to experience or expertise.
- More individuals are needed than can effectively interact in a face-to-face exchange.
- Time and cost make frequent group meetings infeasible.
- The efficiency of face-to-face meetings can be increased by a supplemental group communication process
- Disagreements among individuals are so severe or politically unpalatable that the communication process must be refereed and/or anonymity assured
- The heterogeneity of the participants must be preserved to assure validity of the results, i.e., avoidance of domination by quantity or by strength of personality (bandwagon effect") (1975, 4 [35])

4.5.2 Selection of Participants

The success of a Delphi study is largely dependent on the quality of the participants. According to Delbecq, Van de Ven, and Gustafson, potential respondents should meet four criteria. It is unrealistic to expect effective participation unless respondents:

- (1) feel personally involved in the problem of concern to the decision makers;
- (2) have pertinent information to share;
- (3) are motivated to include the Delphi task in their schedule of competing tasks; and
- (4) feel that the aggregation of judgments of a respondent panel will include information which they too value and to which they would not otherwise have access (1975, 87-88 [35]).

4.5.3 Sample Size

A cross section of 30 experts from telecommunications industry practice, policy makers from academia and institutions dealing with regulation of telecommunications

sector will be asked to verify and rate the relative importance of the set of identified items from comprehensive literature study. The panel members will be asked to rank the items according to the best of their knowledge, experience and skills, and further suggest in their opinion any other items of importance that they might feel is missing on the list.

In order to ensure validity, firstly, experts will be selected from different arena of telecommunication industry from across Africa, Europe, US with about half of them coming from South Africa and Uganda. Secondly, the experts will be from a cross-section of telecommunications industry. Thirdly, the experts will have different knowledge, experience and skills of telecommunications technology and policy-making. Fourthly, apart from the feed-back after round one, there will be no private communication between and/or among the experts; therefore ensuring confidentiality. Lastly, using the two different types of panelists to react to the common list is that, although both groups come from different parts of the industry, they represent unique perspectives of expert opinion on practice and theory of telecommunications technology and policy-making.

4.5.4 Data Gathering and Analysis Procedures

Rounds 1, 2 and 3 Questionnaires will be distributed to the participants. The cover letter will explain (1) the process; (2) the anticipated time required to complete the entire Delphi process; (3) the deadline for completing the Round x questionnaire; (4) the anonymity of the participants; and (5) the feedback mechanism once the process has been completed.

Upon return of the questionnaires, the researcher collates the initial results, grouping similar responses and may make minor editorial revisions to the responses (*i.e.*, shorten), but must retain the intent of all answers. A second questionnaire is then generated with each of the results presented along with an ordinal scale, such as a Likert scale, for the participants to rate the importance of each response.

The revised questionnaire is sent to the participants as expeditiously as possible to maintain their commitment. The cover letter, as well as the questionnaire, instructs participants to rate each of the responses and to elaborate upon any responses that they choose. Make sure that you define the rating scale. Indicate to the participants that the order of the statements is for convenience and not necessarily by importance. Once again, a deadline for response is given.

Collect and collate all of the Round 2 questionnaires. Calculate the mean (average) and mode (most frequent response) for each of the responses. Organize all of the written comments

The participants review and comment on the Round 2 results. In this Round the same statements are ordered along with the mean and mode scores for each statement and any written comments. The participants are asked to rethink and rescore each of the statements. The intent of the rescoring is to determine if there are cogent comments that either will bring convergence of opinion or determine if there is divergent opinion concerning this item. As before, a deadline is established for the return of the questionnaire.

During the first two rounds, each of the sub-panels will receive a form of the instrument containing all the items along with a cover letter that includes an explanation of the study and the six or four point Linkert's rating scale. In addition to rating each of the items, raters will be asked to make additional suggestions related to (a) the phrasing of items or (b) ideas about any new items that they believed should be added. The only difference between the first and second round procedure will be that interquartile ranges of the first round ratings will be placed on each of the second round items.

If any of the panelists second round ratings falls outside of the interquartile range, they will be asked to provide a brief explanation of their rating in the comments section. If panel members agree with the majority rating, no additional commentary will be required. Panelists will also be requested to make written comments or reword those items, which lacked clarity as part of the feedback on the second round instruments (if applicable).

In round three, interquartile ranges will be placed in brackets directly on the instrument along with any comments obtained during round two.

5. Initial Findings

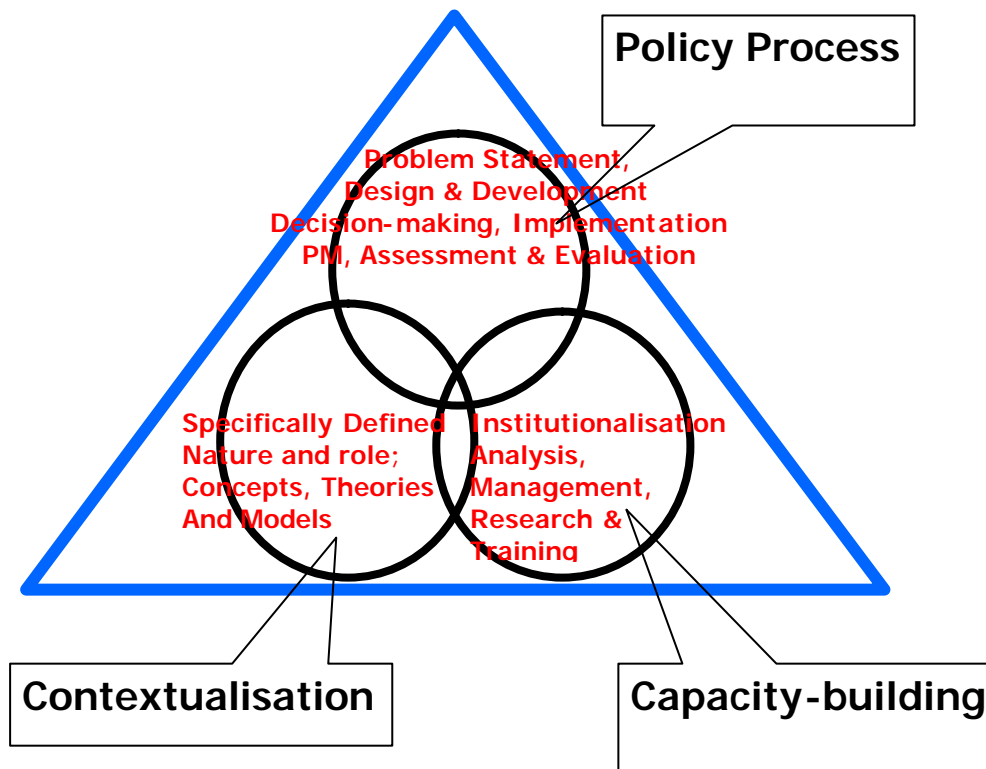
5.1 The Development of Telecommunications Policy Framework

The conceptual model of the key attributes of the new telecommunications policy framework can be graphically summarised as in the figure below.

The key attributes of the desired telecommunications policy framework shall consist of three major components: 1) focused conceptualisation or context; 2) well-defined policy process; 3) built-in capacity for improvement

1. Contextualisation:
 - Specifically defined nature and role
 - Concepts, theories and models
 - Historical development and current status
2. Policy Process
 - Problem statement or agenda-setting
 - Design & Development
 - Decision-making or choice of alternatives
 - Implementation or operational deployment
 - Project Management
 - Assessment or Evaluation
3. Capacity building for policy improvement
 - Institutionalisation
 - Policy analysis and management
 - Further research and Training

Policy Improvement Framework



POLICY FRAMEWORK = *CONTEXTUALISATION* **n** *POLICY PROCESSES* **n** *CAPACITY-BUILDING*

5.2 Conclusion: Progress Report

As a work-in-progress, the above initial findings are mainly from comprehensive literature study and construction of the Delphi technique questionnaires for round one. The SAIS 2000 provides some conclusive inputs but will still undergo a secondary data analysis before the final conclusions can be drawn for the development of the new telecommunications policy framework for an emerging knowledge society.

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