National Convergence Policy in a Globalised World:

Preparing South Africa for Next Generation Networks, Services and Regulation

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"A gale of creative destruction is currently blowing through the industry… The telecommunications sector must reinvent itself for a new age of plentiful and ubiquitous supply."

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0. Executive summary

Governments across the world are grappling with appropriate policies to optimise the benefits associated with converging technologies and markets and to ameliorate potentially negative outcomes. Convergence has emerged as a global phenomenon as a result of digitisation which has allowed traditionally distinct services to be offered across interchangeable platforms. These technological trends have been accelerated by the liberalisation of markets allowing for the development of global digital communication networks offering multiple services across national borders. While converging technologies have changed the face of global communications and will continue to do so in future, the take up of converged technologies and services has been much slower than suggested by the hype even five years ago. The reasons for this are multifarious. At the global level the burst of the dot.com bubble, compounded by the global recession has slowed down investments both in the research and development and investment in infrastructures and services but the way convergence will play out at the national level will differ according to the market, governance and cultural arrangements of individual countries.

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What is evident at this stage however, is that it is these technological developments, together with the liberalisation of markets, that have been harnessed by those countries that are building national information infrastructures, are critical to the development of effective modern economies These are characterised by integrated broadband networks offering high speed access to a multitude of customised services and content to meet a variety of needs across the economy and society from finance to education. These national 'infostructures' serve as nodes in a global high speed communication network allowing the economies of those countries to engage in the global economy. While public and private business is transacted within these nodes and across the globe, two thirds of the world's population are marginalised from these information and decision-making networks, undermining their rights to equality as citizens and consumers. This increasing gap between those with access to these global information networks and those without access has been labelled the digital divide and represents one of the major challenges for policy makers across the world.

For nearly a decade South Africa has articulated a vision for itself of an information society inclusive of all its citizens, participating in the network economy with the associated developmental dividends. This remains the challenge South Africa faces as it forges a forwarding-looking and enabling convergence framework. Existing Information and Communication Technology (ICT) policies have tended to move from an industrial economy base addressing as they do their various sectors as distinct silos of activity. For the potential of convergence to be realised and the backbone of an effective digital economy to be developed an entirely new approach will need to be adopted - one that is more reflective of the information era and which will enable the development of the information infrastructure needed to underpin a modern, network economy.

This will require a change in the current market structure with its emphasis on vertically integrated network operations, distinctly regulated along technological lines, toward a more horizontal market design. This will allow for the most efficient delivery of digital services seamlessly across a variety of networks to fulfil an increasingly diverse range of communications needs. A new licensing regime that reflects this new horizontal market structure will need to be devised through the introduction of separate network, applications and services and content licences, some of which may require nothing more than a registration. In the longer term this will move the regulatory regime from the traditional economic regulation of the sector to a potentially less regulatory-resource intensive competition regime.

While the regulatory burden associated with a vertically integrated market of the kind that has tied up ICASA, the Competition Commission and the Courts for the last five years, will be reduced, several new regulatory challenges will emerge requiring a highly skilled regulator. Convergence trends, unaided by the enabling licensing regimes or ownership rules, are likely to result in concentration of ownership and market dominance. Effective regulation will continue to be the lynchpin in the creation of a fair competitive environment, in which the excesses of the market do not impact negatively on public interest considerations of cultural diversity, equitable access and political plurality.

This regulated competitive environment should make services more affordable and allow more citizens to be mainstreamed into the sector. There is no doubt however that there will be significant numbers of people that will need state assistance to access communications services for a long time to come and strategies to achieve this in a multimedia environment will need continually to be reviewed, explored and implemented. However, pursuing strategies of price reduction in the market - not an easy task at the time that one is simultaneously demanding high cost network expansion - would allow more people to meet their specific needs and access subsidies funding could be target at the people who most need it.

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All of this is dependent on a highly integrated national plan that will include strategies to attract, develop and retain the necessary human, financial and intellectual capital needed to operate the information infrastructure. The need for the high level of policy co-ordination results from the role of the communications sector in the network economy both as a services sector in itself and as the underpinning of the other major service sectors in the economy. So, while the focus of this paper is on the convergence taking place in the communications sector, it should be noted that convergence in this sector allows for convergence of all knowledge and transaction based service industries, including finance, education and health. It is this cross-cutting impact of convergence that demands high levels of policy integration or at the very least co-ordination between different government ministries including finance, trade and industry, state enterprises, science and technology, education, arts and culture, health and so on.

The opportunity costs of not developing an appropriate policy and regulatory framework are high and are globally evidenced in what has been coined the digital divide. Countries that are unable to take up the challenges posed by global technological and economic trends are increasingly marginalised, not only from the global network economy, but in their ability to deliver on their own developmental objectives.

Ensuring that South Africa's participation in the global economy is not simply the inclusion of another metropole surrounded by an unconnected periphery, will be a major policy challenge.

The proposed telecom and broadcasting policy review process arises from the inability of existing policies to deliver on anticipated outcomes. Already the drag on the national economy of outmoded policies and legislation formulated not even 10 years ago are evident in the retarded growth in certain ICT market segments and diffusion of ICTs and even negative growth of certain market segments. Ensuring that South Africa's participation in the global economy is not simply the inclusion of another metropole surrounded by an unconnected periphery, will be a major policy challenge but clearly current strategies are not delivering affordable universal access.

As the policy shifts required for South Africa to achieve desired national outcomes are likely to be dramatic, they are likely to require longer timeframes to implement. In this regard prioritising and sequencing policy and regulatory issues is essential. Equally important will be the development of strategies to bridge the transition and to ensure that current policy and regulatory constraints inhibiting ICT penetration and sector and national growth are not perpetuated during the transitional period. This would include the artificial distinctions between voice and data in a digital environment and limitations on self provision, resale and direct connect. While existing licensees rights cannot simply be waived, the implementation of such provisions were anticipated from 2000 in the liberalisation time-table of the South African Telecommunications Policy White Paper. Several of these obstacles could be dealt with by the Minister of Communications simply setting dates for such activities as contained in the Telecommunications Act as amended. Despite the Second Network Operator (SNO) licence not having been finalised, such activities should not be made the subject of any further restrictive practices on other market players or special rights. Short-term financial gains for the state should not be achieved at the expense of longer terms losses arising from the stifled development of this critical sector of the economy. In fact, opening up market activities are likely to create clients for all network operators. Allowing all of them, those traditionally broadcasting and those traditionally telecommunications, to compete equally is also more likely to induce allocative efficiency in the market with the associated benefits for users and consumers.

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The aim of such a policy intervention should be to create a more appropriate and efficient market structure, requiring less negative regulation, better and simpler licensing procedures and ultimately a technology-neutral policy environment that lowers costs to service providers and consumers. Indeed, in a converging environment there are no economic or policy reasons to differentiate among services on the fixed network and less and less reason to

distinguish between fixed and mobile, where there is already a high level of substitutability and which is likely to increase as mobile moves increasingly into data services. These quite modest changes to the law or setting of dates to allow for resale and self-provision will increase competition, providing more choice to users and consumers, lower prices and relieve ICASA from regulating what have been some of the most unproductively contested areas within the sector.

It is against this backdrop that this policy research paper reviews how the benefits associated with convergence can be optimised by a developing country such as South Africa in order to meet national development objectives while at the same time participate effectively at the global level. The paper is not definitive or conclusive but seeks rather to create a framework for understanding convergence, highlighting critical issues and proposing a number of policy success factors.

1. Introduction

Convergence is driven by the technological and economic drivers of digitisation and liberalisation. Digitisation is what makes possible the convergence of the historically separate platforms of broadcasting and telecommunications. The liberalisation of markets is what has driven the development of global digital communication networks offering multiple services across national borders. This has undermined traditional modes of communication and their associated economies of scale and scope offering a communications environment that is more international on the one hand and more fragmented, niched and competitive on the other.

Convergence in the communications sector, allows for convergence of all knowledge and transaction-based service industries, including finance, education and health.

While convergence most commonly refers to the integration of the previously distinct industries of broadcasting, telecommunications and IT, it is also evident within industries themselves such as the convergence between mobile and fixed telecommunication services which historically have been treated as discrete market segments. In fact, although this paper will focus on convergence in the communication sector, convergence in this sector allows for convergence of all knowledge and transaction based service industries, including finance, education and health. This is an important consideration in ensuring the policy integration needed to order to optimise the benefits associated with converged services and infrastructures.

Traditionally, communications markets have been characterised by mass production for domestic markets, usually by vertically and horizontally integrated operations. Arising from these market structures has been a highly regulated environment both for content and carriage. The rationale for regulating content has been largely been socio-cultural. On the one hand, because of the freely available nature of radio and television, control has been exerted over content in the name of consumer protection on the grounds of decency, obscenity or appropriateness particularly to child audiences. The other thrust of content regulation has been to ensure the development and airing of local content through quotas or incentives.

The major rationale for the regulation of signal distribution (broadcasting) and telecommunications infrastructures on the other hand has been the utilisation of scarce resources, particularly spectrum. With the introduction of network competition other resources not originally thought valuable such as rights of way and numbers have gained competitive value. So while the monopoly on broadcasting was for decades justified on political grounds in most jurisdictions, the rationale for a monopoly in telecommunications has been underpinned by economic justifications. Public utilities such as telecommunications and electricity were 'natural monopolies' in that services could not be economically duplicated due to the scale and scope of infrastructures networks.

The new digitised and global environment has eroded such rationales. Low cost wireless technologies have made possible the far more rapid deployment of cheaper networks to compete with or complement existing fixed networks. The emergence of the Internet with its global and digitised nature has eroded traditional mechanisms of controlling content, making enforcement near impossible.

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The resulting global communications infrastructure, underpinning the global economy, is highly uneven. Concentrations of infrastructure, and financial and intellectual capital in major centres, particularly various parts of the United States and Europe, allow these centres to dominate the global landscape. While national goals associated with domestic markets remain policy priorities, the positioning of developing economies such as South Africa in the inevitably and increasing global economy is of critical policy importance. Policies that divert global financial and intellectual capital to national or regional markets and retain that which has been locally formed are needed in order to improve the global competitiveness of the country. Doing this while trying to redress national imbalances presents a particular policy challenge for developing countries and managing the tensions created by this will be part of any successful strategy.

Arising from the development of global markets has been the emergence of multilateral institutions that have taken on the functions of global governance. Institutions such as the World Trade Organisation (WTO), the reforming International Telecommunications Union (ITU) and the International Commission on Names and Numbers (ICANN) are determining, with different degrees of formality, the rules for global participation.[1] While the biases and agendas of various organisations have been identified and the factors contributing to the lack of effectual participation by developing countries acknowledged, the fact remains that, with the globalisation of communications, such global entities will increasingly determine the frameworks for effective participation. It will become increasing important to divert resources towards influencing these agendas and their outcomes in ways that represent the interests of the developing countries and emerging economies.

[1] *For an examination of the tensions between South Africa's domestic policy reforms and international trade aspirations see Cohen, T (2001) Domestic Policy and South Africa's Commitments under the WTO's Basic Telecommunications Agreement: Explaining Apparent Inertia,* ***Journal of International Economic Law,*** *Oxford University Press, Oxford.*

As a result, national policy frameworks should correspond in so far as is feasible with global trends and developments, while meeting domestic objectives. These are increasingly characterised by converging markets, offering a multitude of services across numerous platforms, reflecting by internationalisation on the one hand and customisation on the other.

While such developments are inevitable it should be noted that convergence has not progressed at the speed at which was previously thought, largely due to a number of technological, market, regulatory and consumer barriers. In this regard many developing countries trying to develop appropriate policy and regulatory regimes for this environment are not very far behind more mature economies which continue to wrestle with these issues. While the problems associated with developing an enabling environment for converged services are similar for developed and developing countries, developing countries do of course face particular developmental challenges. It is here that the potential not only of technological 'leap-frogging' but abandonment of linear development approaches to market structures and their associated regulatory regimes, need to be courageously considered. The needs in Africa are so great and the backlogs so immense that only a fundamental paradigm shift in approaches to communication will provide the necessary solutions.

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2. Background

2.1 Broadcasting

South Africa's market and governance arrangements for telecommunications and broadcasting have been subject to vast changes in the last decade. These changes reflect enormous political and social transformation at the national level, and are also in line with rapid changes in the global communications market. The Independent Broadcasting Act of 1993 together with the Broadcasting Act of 1999 have ushered in changes that have seen the public broadcaster transformed from a state broadcaster into a public broadcaster and the public broadcaster further corporatised and its commercial and public components distinguished. While the South African Broadcasting Corporation continues to dominate the television and radio market, the introduction of a free-to-air private broadcasting station, E-tv, in 1998 has provided another voice in the market and is the fastest growing TV station. More by default than design, from a policy point of view, the country also has one of the most sophisticated digital satellite subscription services in the world, DSTV, which emerged from the long standing analogue terrestrial service MNet, owned by the countries major newspaper countries. The face of radio has also changed dramatically since 1994 with the licensing of hundreds of community radio stations, the privatising of all SABC regional radio services, and the granting of greenfield licences in the major metropolitan centres.

The developments reflect some successful policy outcomes to the major objectives of the broadcasting policy and legislation:

- promote diversity and range of services, content and ownership, particularly HDI through geographic, cultural and levels of services;
- provide develop and protect a national and regional identity, culture and character particularly through local content development and independent production; and
- restrict cross-media ownership and control and foreign ownership in pursuance of some of the objectives listed above.

The production and airing of local content has been promoted through the setting of quotas for different categories of television programming together with independent production quotas. Music radio stations are also required to conform with quotas for South African music that are believed to have impacted positively on local music production. Although not unflawed, the Independent Broadcasting Authority forged this new environment, without the benefit of a guiding policy process or framework until the White Paper on Broadcasting was produced in resulting in the Broadcasting Act of 1998. The Act, which sought to provide policy direction to the Authority and deal with the omissions of the IBA Act and the rapidly changing technological environment, was however poorly conceptualised and crafted, resulting in legislation that was at least in parts, difficult to implement effectively or without being taken on review. Some efforts were made during the merger of the IBA and SATRA through the Independent Communications Authority Act of 2000 to resolve some of these failings but the inability of the legislation within a few years of its promulgation to deal with the rapidly changing environment are evident and acknowledged by the need for another policy review. Some of the fundamental aspects of content regulation such as restrictions or quotas on content are almost impossible to deal with in a converged environment and ownership limitations may have the effect of restricting investment in content and network development or prevent network efficiencies that may benefit consumers. These factors will all require review in the new policy process.

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A similar pattern developed in the telecommunications sector with the Amendment Act (2001) which sought to deal with the omissions and limitations of the 1996 Telecommunications Act. Although the Telecommunications Act arose from a widely consultative process, much of the consensus brokered to deliver the policy White Paper was not translated into the Act, and even the highly respected White Paper, failed to anticipate the speed with which the telecommunications environment was changing. In seeking to deal with the omissions of the earlier acts, both the Broadcasting Act and the Telecommunications Amendment Act overreacted by placing far too much detail in the legislation, including several specificities which would have best been contained in regulation and which would have left the Acts more flexible and focused on principles and

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mechanisms. The reason for this most likely lies either in a distrust of the regulator to effect the political mandate of Government or in a lack of confidence of its capacity to do so.[2] Either way, the effect has been to restrict the independence of the regulator which has impacted on its legitimacy within the sector. This is particularly so in the telecommunications sector where the co-jurisdiction of licensing and regulation by the Minister of Communications and the regulator have not served South Africa well and resulted in regulatory bottlenecks and a litany of legal challenges.

Broadcasting has had its fair share of licensing controversies and regulatory disputes with industry. These appear to have been managed more effectively however, within the existing regulatory arrangements and without recourse to the courts. While there are several factors that distinguish the broadcasting and telecommunications industries in South Africa, an obvious difference is the fundamental difference in their governance arrangements. The independence of the broadcasting authority continues to have the protection of the constitution, while telecommunications regulation does not. This may well account for the perception that broadcasting has been able to deliver more effectively on its mandate and that the broadcasting industry have not been able to play off different decision-makers on licensing and other regulatory issues.

2.2 Telecommunications

As the first phase of post-apartheid telecommunications policy – which focused on the partial privatisation of Telkom and an extension of its monopoly on basic telecommunication services – has ended, a new phase – characterised by a policy of 'managed liberalisation' – has commenced. Although a number of important economic and social goals crystallised from the policy into the objects of the Telecommunications Act (No. 103 of 1996), the primary objective of this initial period was to increase affordable access to communications through gradual liberalisation of the market – specifically:

- the expansion of the fixed line network through the partial privatisation of the incumbent fixed line operator, accompanied by the granting of a five year exclusivity period to the operator, in exchange for an obligation to double the network; and
- by introducing competition in limited service sectors by licensing a third cellular operator and facilitating service based competition in the value-added network services (VANS) market; and
- by creating and establishing a sector regulator to implement policy; create a transparent and certain regulatory environment for investors and consumers and contribute to building a stable and well-functioning market.

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2 *See McCubbins, Noll and Wingast, Administrative procedures as Instruments of political Control,* ***Journal of Law, Economics and Organization****. Vol.3 , no 2, Fall 1987 for discussion of principal-agent theory*

Other policy goals also include the promotion of an innovative and responsive sector through the development of broad and diverse service offerings; a competitive manufacturing and supply sector; the promotion of competition; investment and stability in the sector, as well as encouraging a diverse shareholder base through the promotion of SMME's and historically disadvantaged groups and individuals; and developing a strong consumer focus also taking into account the needs of local communities and disabled users, as well as ensuring technical compliance and efficiency and facilitating the development of human resources within the sector.

In an attempt to deal with the legislative lacunas that emerge as soon as previous ones appear to have been addressed in this rapidly evolving sector, the government has also introduced disparate pieces of legislation. The Electronic Communications and Transactions Act was passed to facilitate e-commerce and create the legal environment to enable online transacting, and the Regulation of Interception of Communications and Provision of Communication-Related Information Act (2002) was recently promulgated in an attempt to reduce the use of ICT in criminal activities with the use of intelligent systems within the communications networks.

There is little doubt that the sector has been dramatically transformed from what it was even six years before. This has been brought about by the partial privatisation of the incumbent operator Telkom in 1997, then the initial public offering earlier this year, and the introduction of a third cellular licence and the opening up of the VANS market for competition. Arising from the Amendment Act we have further seen the granting of carrier of carrier and multimedia licence to the broadcasting signal distributor, Sentech and the intention to licence a Second PSTN Operator and an initial 10 under-serviced area operators.

The outcomes of these policy reforms has however been mixed. There are some indications that policy restrictions have retarded areas of organic growth in the market such as in the areas of VANS and Internet. In fact, the segment of the market protected in order to deliver on universal service, fixed line, has over the last two years had a declining number of subscribers on its network. On the other hand mobile cellular services, which were introduced as essentially for corporate and high-end residential users, have become the major source of connectivity for South Africans, with mobile subscribers having outstripped the number of fixed line subscribers over two years ago. However, despite the achievements of mobile, it is also clear that fixed lines will continue to be an important developmental measure. This is especially true in terms of access to the Internet. It is possible that as mobile helps to combat the voice access portion of the digital divide, a new gap in terms of access to the Internet, both in terms of cost and quality of Internet connections, will grow unless further fixed line rollout and upgrades occur.

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2.2.1 *Affordable access*

The central strategy for achieving universal service, in line with multilateral agencies' models at the time, was that of the partial privatisation of the fixed line incumbent in order to capitalise the extension and modernisation of the network. The Ministry of Communications oversaw this privatisation process. The arising responsibilities of the Regulator were to monitor the terms of the licence, with regard to rollout and quality of services targets, and the Ministerial imposed price cap on tariffs. It was also required to prescribe regulations to facilitate interconnection and access to Telkom facilities. Acknowledging that this on its own would not meet the needs of the poor, the policy and legislation allowed for the establishment of a Universal Service Fund from a levy on operators' turnover that could be used to subsidise the extension of networks in uneconomic areas and usage by 'needy people'. This Fund was to be administered by the Universal Service Agency (USA). While the purpose of this approach was to establish a dedicated agency that would focus on achieving universality in telecommunications, the effect of this was to remove the universal access mandate from the core function of the regulator, although it continued to have some enforcement functions in that regard.

From the perspective of promoting universality, the results of Telkom's exclusivity period together with the leadership and capacity problems that have wracked the Universal Service Agency, have been disappointing. While fixed line communications has slowed down all over the world, South Africa is one of the few countries in the world with a declining number of subscribers on the network. While it has successfully grown the lucrative corporate market during the period of the exclusivity, it may well be that there are fewer residential subscribers on the fixed network today than in 1996, with over 600,000 disconnections in the last 30 months.

Table 1 - South Africa Telephone Subscribers per 100 inhabitants

	For Year Ending March							
Indicator	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**CAGR 1997-2002**	**CAGR 2000-2002**
Main telephone lines per 100 inhabitants	10.1	10.8	11.8	12.8	11.5	11.4	2.5%	-5.6%
Cellular mobile telephone subscribers per 100 inhabitants	2.3	4.0	7.1	12.1	19.3	24.9	61.0%	43.5%
Total telephone subscribers per 100 inhabitants	12.4	14.8	18.9	24.9	30.8	36.3	24.0%	20.7%

Source: 2002 Telkom Annual Report.
From: Gillwald, A and Kane, S: (2003) LINK SECTOR PERFORMANCE REVIEW.

In South Africa and other developing countries, universality will only be achieved by a combination of increased access to telephone services and equally importantly by ensuring that those services are affordable to the general population. Following its Rate Review, the regulations prescribed by ICASA were delayed by the Ministry, allowing Telkom to go ahead with increases out of line both with inflation and its own claimed productivity gains, with the net effect of prices on basic services have increased by over 250% in Rand terms over the last six years.

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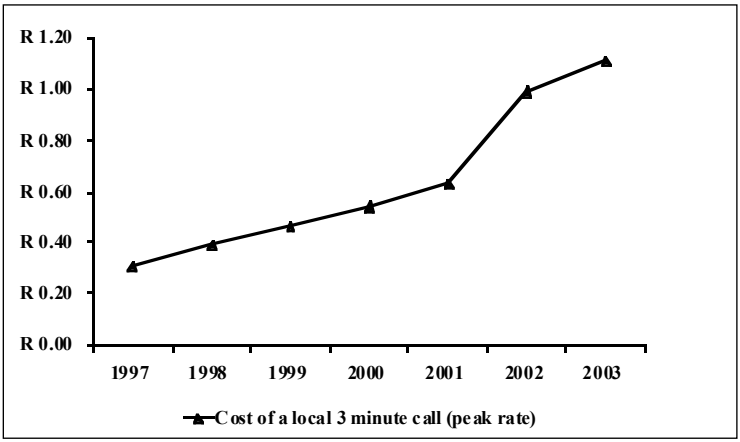
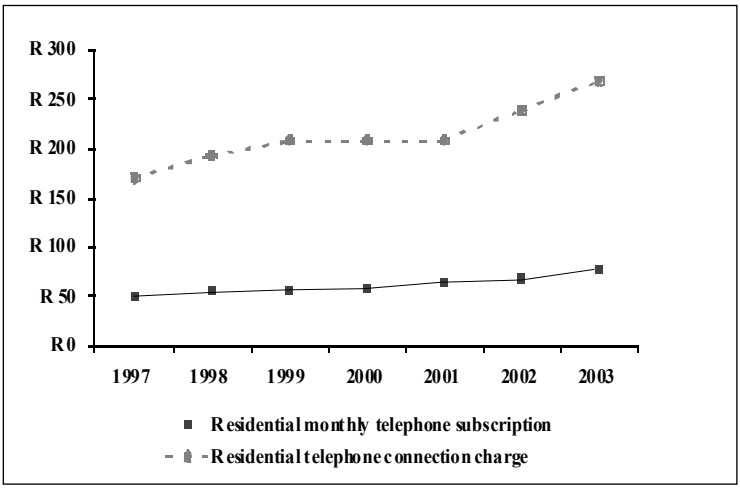
Figure 1 - Telkom Tariffs, 1997 – 2003 (Nominal)



Cost of a Local 3 Minute Call (Peak Rate)



Cost of Monthly Subscrip./Connection Charge

Source: 1997 – 2000 from ITU World Telecommunications Indicators Database (2002), 1998 – 2003 from Telkom Press Releases. Gillwald, A and Kane, S (2003) LINK CENTRE SECTOR PERFORMANCE REVIEW

The saving grace with regards to contributing to the achievement of universal service, has been the exponential growth of mobile which in the policy process of the mid 1990s had been viewed as an elite service for the business market and certainly not the intended vehicle of universal service. Around the world the performance of mobile over the past six years has been nothing short of extraordinary with many countries achieving subscriber increases in excess of 100%. While South Africa's growth rate is lower than this it is nonetheless impressive given the relatively large initial base of 2.35 million subscribers off which it was achieved.

In Africa the figures tell a similar story, with the majority of cases of universal service growth achieved during the latter half of the 1990s coming as a result of the growth in mobile penetration. Morocco provides a particularly interesting parallel, where clearly the exponential growth of mobile of 150% from 1996 to 2001 is resulting in mobile substitution of fixed services, as must be happening to at least some degree in South Africa. It is likely that the rapid increase in Telkom's prices is, in combination with the growth in mobile, the cause of the high number of people coming off the fixed line network in South Africa in the past three to four years. This reinforces the point that it is both increased access (seen in the more than two million new lines installed by Telkom) and increased affordability (not yet seen in South Africa) that is necessary to achieve universal access.

2.2.2 *Competition and innovation in services sector*

This outcome is arguably the least successful aspect of the first phase of managed liberalisation. While mobile services have become increasingly competitive with anticipated innovation in services offerings both technically and from a marketing and billing point of view, there has not been the kind of growth and innovation anticipated in the value added network services and Internet service providers market. The VANS and ISPs attribute this primarily to the anti-competitive behaviour of Telkom. The blame for this inhibiting effect on this critical information economy sector has often been placed at the door of the regulator, the Independent Communications Authority of South Africa, ICASA, as the party responsible for reigning in the incumbents alleged anti-competitive behaviour. While it is true that the regulator has suffered a capacity deficit and has not always acted as swiftly and procedurally as desired, the inherent tendency towards anti-competitiveness lies in the market structure which requires a resource intensive regulatory regime. The market is structured around a vertically integrated national operator from whom rival firms (with whom the integrated company competes downstream) are required to acquire their non-competitive facilities in order to operate and with whom other networks have to interconnect in order for their customers to access the historically larger number of subscribers on the incumbent's network. This structure creates anti-competitive incentives for the incumbent to deny access to its network to rival firms, whether through delays or pricing strategies.

While it is true that the regulator has suffered a capacity deficit and has not always acted as swiftly and procedurally as desired, the inherent tendency towards anti-competitiveness lies in the market structure which requires a resource intensive regulatory regime.

Traditionally, the regulatory response to this market structure, which tends to arise wherever a former public utility enters into a competitive market, is access regulation. Together with the delays around establishing a clear and timely interconnection regime, which has come close to bringing smaller empowerment entrants to their knees, the absence of this cornerstone regulation essential to enabling fair competition, has reduced investor confidence. These effects have been especially prominent in the VANS and ISP segments of the market where Telkom's rights and behaviour have had a chilling effect on the market's growth. This has been one of the major sources of tension in the sector and the source of numerous disputes between the independent VANS, who claim that Telkom is leveraging its market power with anti-competitive effect in the VANS market, and Telkom, which complains that the VANS are infringing on its exclusivity rights. While the failure to regulate the privatised monopoly effectively has been placed at the door of the ICASA and before it SATRA, it is important to understand the structural conditions established by the policy and laws under which regulation takes place.

2.2.3 *Independent Regulation*

The notion of independence relates to autonomy both from government (which may include the incumbent if it is not privatised) and the industry[3].

In broadcasting, independence has particular overtones relating to political independence due to the content aspects of regulation and the needs to ensure public as opposed to state broadcasting on the one hand and to ensure a space for public interest broadcasting in an increasingly commercial global environment. For this reason the independence of the regulation of broadcasting is enshrined in the Constitution of South Africa.

The importance of this policy outcome in telecommunications relates to the centrality of independent regulation to the structural reform of the telecommunications sector from a public utility to a diversified range of competitive networks and services. The legitimacy of the regulator will directly affect the quality and speed of that reform. The potential for market foreclosure, particularly by dominant incumbents, underlies the requirement for an effective independent regulator to be established if liberalisation policies are to be effective. In addition to ensuring affordable tariffs and adequate service levels for consumers receiving services from the non-competitive components where consumers have no choice but to obtain service from that one provider, regulators are responsible for ensuring access to the network and facilities of monopoly or dominant operators if the benefits of competition in liberalised sectors are to be realised. Due to the hybrid, partially monopolistic, partially liberalised nature of the telecommunications market in South Africa the regulatory approach included both access and accounting separation regulation. However, access regulation, including tariff

The importance of this policy outcome in telecommunications relates to the centrality of independent regulation to the structural reform of the telecommunications sector from a public utility to a diversified range of competitive networks and services.

[3] *The concept has been explored in regulatory capture theory, which examines the potential of regulators, even those that appear statutorily independent, to be systematically influenced by one party or the other. For a consideration of the theory in relation to South Africa see Cohen, T (2003) Rethinking (Reluctant) Capture: The Development of South African Telecommunications 1992-2002 and the Impact of Regulation',* ***Journal of African Law****, Volume 47:1*

regulation, whether price cap or rate of return regulation, interconnection and facilities regulation all depend on complex costing models and assume a high level understanding of the market if they are not to result in regulatory failure. This kind of regulation is also inherently plagued by information asymmetries that tend to be more severe in countries with new under-resourced and inexperienced regulators and telcos with highly experienced strategic equity partners. Even countries that are able to draw on a plethora of economic, legal and engineering skills, struggle to conduct informed, flexible and sensitive access regulation to ensure fair competition without creating market distortions. The questions arises whether even emerging economies with some skills such as South Africa, should be allocating scarce resources to the intensive form of regulation which is required to consistently adjust the behaviour of the operator which is responding to anti-competitive incentives in the system rather than designing a market with competitive incentives instead. A structurally separated market that would induce competition would also be more conducive to convergence.

Even countries that are able to draw on a plethora of economic, legal and engineering skills, struggle to conduct informed, flexible and sensitive access regulation to ensure fair competition without creating market distortions.

The mixed outcome of the policy objective of independent regulation in relation to telecommunications results from the contradictions within the policy and legislative arrangements. While overcoming the human and financial deficit within ICASA have been identified both by the regulator and the industry as the major challenges facing the regulator, the structural contradictions within the policy and legislative arrangements are a major cause of the intermittent regulatory failure witnessed since the establishment of the telecommunications regulator in particular. These relate to the dual jurisdiction on regulatory and licensing matters between the Minister and ICASA which requires that the Minister approve all telecommunications regulations determined by ICASA. This requirement has created a regulatory bottleneck in the implementation of policy from time to time and uncertainty in the industry. The shared licensing responsibilities have also been a source of tension in the industry and allowed interested parties to play one set of decision-makers off against another with all major licencing processes to date being highly controversial. These have been a major source of contention between the Ministry and the regulator and have frustrated ICASA's attempts to deal with critical issues in the industry. These statutory arrangements have also created a structural conflict of interest for the Minister who has been responsible for approving regulations in the best interests of the industry while being responsible at the same time for realising the value of incumbent as a major state asset — whose interests are often not aligned with those of the broader industry. Clearly the rights of the Minister to intervene in the core regulatory and licensing functions of the regulator were legal arrangements during a period of transition to allow the Minister the room to negotiate initially with the strategic equity partner for Telkom, create conditions conducive to Telkom's IPO or to maximise the value of the SNO licence. Whatever the reasons, the lessons from the first reform period is that these arrangements have led to uncertainty in the industry and among investors, have allowed interests to play the regulator off against the Ministry and finally,

The mixed outcome of the policy objective of independent regulation in relation to telecommunications results from the contradictions within the policy and legislative arrangements.

have opened the process to legal review, all of which have impacted negatively on South Africa as a preferred investment destination for telecommunications. In fact broadcasting regulation which has not faced the same intensity of co-jurisdiction and is able to prescribe regulations and grant licences independently of the Ministry, has been less susceptible to the same controversy.

An assessment of the successful implementation of the policy objective of establishing an independent regulator has to take into account the merger of the South African Telecommunications Regulatory Authority (SATRA) with the Independent Broadcasting Authority (IBA) in 2000. The ICASA Act largely deals with the merger of the two decision-making bodies, the Councils. The actual regulation of broadcasting and telecommunications is still determined by the *Broadcasting* and *IBA Acts* and the *Telecommunications Act*. In this sense the ICASA Act does not provide the framework for regulation within a convergence environment but rather the logistical merger of two separate bodies into one functional organisation.

3. Conceptualising convergence

Convergence has been described by the ITU as the, "technological, market or legal/regulatory capability to integrate across previously separated technologies, markets or politically defined industry structures. Convergence also involves an important international component, as many services and information sources that were traditionally controlled on a domestic level are being provided on a global basis"[4]. The concept driving this digitisation of information, and the transmission thereof across combinations of audio, visual and data platforms is that of efficiency.

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The processes of compression and decompression of digital bits explain the technological efficiency inherent in convergence. This allows for use of less band-width and the freeing up of greater parts of the medium for the transmission of increased bits. In addition because with digital compression smaller bits are being transmitted, money is saved.

So, while convergence may include integration, it often goes beyond integration which was evident in old analogue models. The Australian Convergence Review (2000) contends that the "necessary condition for structural convergence in a service industry is the emergence of a digital alternative to traditional service delivery". This "convergence test" however, is not a sufficient condition, as even if a digital alternative is available, market adoption could be inhibited by other factors such as lack of consumer confidence or restrictive technical standards.[5]

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[4] *ITU (1999) Trends in Telecommunication Reform: Convergence and Regulation, Geneva, p.2*

[5] *Australian Convergence Review (2000) p3 at www.noie.gov.au visited on 28/05/2003*

The Review defines convergence as:

> services sector restructuring enable by digitalisation. It is the transition between two structural models for service delivery. The traditional model is dominated by analog or physical technologies favouring mass production, domestic market focus, and vertically and horizontally integrated corporate structures. Conversely, the new service delivery model uses digital programmable networks that favour mass customization, an international market focus and vertical separation between the services the users see and the underlying delivery platform. [6]

So while traditionally the market structure has been vertically integrated, convergence drives and is stimulated by a structural separation between three layers of activity: infrastructure, connectivity and applications and content. While the infrastructure underpins the connectivity and applications market, in a fully converged environment it is not the most profitable, with the value lying in the added layers that run above it, particularly at the very top of the value chain, where content production lies. This is assisted by easier market entry higher up the value chain which faces few licensing barriers.

Convergence drives and is stimulated by a structural separation between three layers of activity: infrastructure, connectivity and applications and content.

3.1 Technological convergence

While convergence occurs in multiple ways, the most commonly referred to aspect of convergence is the technology. This refers primarily to the integration of networks, services and content through digitisation making possible the transmission of content from historically distinct platforms.

Henten et al. have developed a useful framework to understand convergence and associated processes of integration and disintegration that occur horizontally and vertically across sectors.[7] Horizontal integration of the IT, telecom, broadcasting and other media sectors has largely been evidenced in the equipment, infrastructure and applications. That is to say a single piece of customer equipment can be used increasingly for data, telecommunication and video services or networks for the transmission of telephony or broadcasting, such as cable for telephony or digital TV for Internet access or ADSL for video on demand. There is increasing convergence in the ability to deliver content across different platforms but generally the content requires adaptation and there are questions around consumer practices and preferences. So that while convergence may be technically possible, the application of content to different formats may not be automatic and demand may not be there, nullifying a business case.

So that while convergence may be technically possible, the application of content to different formats may not be automatic and demand may not be there, nullifying a business case.

[6] *Ibid at p5.*

[7] *Henten, A Falch, M and Tadayoni, R (2002) Some implications for regulation of ICT and Media Convergence, LIRNE.NET, Center for Tele-Information (CTI), Technical University of Denmark, World Dialogue on Regulation, Discussion Paper #0202, www.regulateonline.net (visited on 25 May 2003).*

Figure 2: Convergence / integration and divergence / disintegration

	IT	Telecom	Broadcasting	Other media
Content/ services	Software based content	Telecom based services and content	Broadcast programs	Film, music, newspapers, etc.
Transport/ software	Generic software	Network services	Transmission	Cinemas, video rentals, etc.
Equipment/ hardware	Hardware	Telecom equipment	Broadcast equipment	Reproduction of films, printing, etc.

Source: Henten, Falch and Tadoyini (2000) at 4

Vertical integration has long been a characteristic of public networks within the broadcasting and telecommunications sectors. In telecommunications this occurred traditionally between customers equipment, infrastructure and services. Integration of distribution of content has long been a practice in the broadcasting industry. With proprietary technologies associated with broadcasting subscriptions services and new data services, this has been extended to customer equipment. Such vertical integration really only has convergence implications when it cuts across traditionally separate sectors, such as Internet access from digital television or telephony or broadcasting over the Internet.

Henten et al. point out that other technical factors impacting on the convergence process include network architecture, capacity requirements of the services, quality of service requirements and usage requirements of the services.[9] The main differences in network architecture relate to the differences in broadcasting and telecommunication networks. Broadcasting networks are traditionally designed for one-to-many transmission. The high capacity associated with broadcasting for example enables downloading of data at rates several magnitudes of scale quicker and more cheaply than traditional telephony network design for point-to-point communication. The low capacity per user associated with broadcasting technologies, has been hampered however by having no return path for interactive services. Interactive services using broadcasting technologies have had to rely on other networks for the return path. The latest standards for digital broadcasting will allow, however, for an integrated radio return path.

The point-to-point network architecture of telecommunications means that service providers have been able to customise their services to meet the needs of individual users but generally at relatively high cost because the customer line in the local loop is not shared and usually of relatively high maintenance, making the expansion of integrated services slow. While customised video services - video-conferencing, video-on-demand and the like – may be reasonably cost effectively offered over switched services, broadcasting in the more conventional

[9] *Ibid at 7*

sense is unlikely to be efficiently offered over expensive and intelligent switched networks. Even when there is sufficient capacity to provide broadcasting services over Internet, the use of a routed network is unlikely to be as efficient and cost effective as transmitting over a broadcasting network.

Broadcasting networks with their one-to-many design are therefore likely to be the most efficient means of delivering non-customised services to the end users for sometime. Perhaps more importantly, even when capacity exists, usage conventions and complexity of access may determine consumers' preferences.

Henten et al. also point out that one of the major barriers to convergence lies at the infrastructural level.[10] It is here that digitisation is really only one of several parameters influencing convergence. None of the currently available infrastructures can integrate all services; this is also currently less likely in the last mile than in the backbone. Where potential does exist for upgraded access currently it would not be cost effective to implement. Components of converged services can be transmitted seamlessly across complementary networks optimising the available capacity and character of different networks. Enabling such progressive utilisation of network capacity is what policy and regulatory frameworks need be geared towards.

While a positive policy outcome of convergence may also enable competition, for developing countries a more fundamental outcome could be on the potential of converged services to complement currently limited services on distinct networks for greater network extension and service penetration.

The main motivation for convergence is that various services can be transmitted more efficiently across a variety of networks. As a result, the policy focus in developed countries has been on the contribution of convergence to enhancing competition. While a positive policy outcome of convergence may also enable competition, for developing countries a more fundamental outcome could be on the potential of converged services to complement currently limited services on distinct networks for greater network extension and service penetration.

Policy and regulatory consideration of this issue should not be limited to current communication infrastructures, though considerable potential exists to use broadcasting networks more extensively to deliver telephone services and for mobile networks to offer Internet services, if the prices can be brought down sufficiently. While a policy and regulatory framework that allows for better integration of existing broadcasting and telecommunications networks to create a national information infrastructure is necessary, technological developments in historically distinct service areas such as the use of the power grid for communication applications needs to be accommodated in policy and regulatory frameworks and resulting institutional arrangements.

For the benefits of convergence to be realised, market structures needs to be sufficiently flexible to allow for the organic integration of market segments and the regulation of markets needs to be appropriately enabling.

It is important to remember that while the technological developments associated with digitisation are certainly necessary conditions for convergence, they do not provide the sufficient conditions for optimising the benefits of convergence. Technological convergence has long been possible. Restrictive policy and regulatory environments and associated market designs have inhibited its evolution. For the

[10] *Ibid at 7*

benefits of convergence to be realised, market structures needs to be sufficiently flexible to allow for the organic integration of market segments and the regulation of markets needs to be appropriately enabling.

3.2 Market convergence

So despite technological convergence having long been possible, a range of other financial and consumer factors have determined implementation in the market.

The technological vertical integration in the telecommunications and broadcasting industries historically reflected the vertical market integration. The liberalisation of the telecommunications market globally in the 1980s saw changes to this traditional structure with the separation of equipment initially and later the unbundling of services from infrastructure in response to market demands. In broadcasting, while content production and distribution have been highly integrated, equipment production in traditional terrestrial broadcasting has been separated. In the increasingly digital subscription television market, equipment has tended to be integrated though there has been greater structural separation of content in such services. Very often, rather than content being vertically integrated in such operations however, cross ownership and other forms of control and influence are likely to have prevailed. Even in the IT industry hardware and software have been separated for some time.

Henten et al. point out that market convergence can be evidenced at all three levels and these reflect the technical dimensions of convergence:

- convergence of content production is related to service convergence
- convergence of distribution is related to network convergence
- a convergence in equipment production is related to terminal convergence.[11]

Convergence is most evident at the level of content, for example provision of news content across newspapers and, or television and on a website and services such as Internet offered over telecom networks or over DVB networks. The leveraging of content development across different platforms however is not straight-forward and in order to be competitive requires extensive adaptation to the medium. The effect of the convergence of services and content means that there is likely to be greater competition, providing consumers with greater choice on price and quality between services offered across different platforms. For some time to come however, platforms will specialise in areas of telecom or broadcasting and offer complementary services to their core service, which is likely to influence, and be determined by, consumer patterns.

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Convergence of distribution and transmission between broadcasting and telecommunications is perhaps best evidenced in the cable networks, particularly with the increasingly enabling regulatory environment provided for them in North America and Europe to better offer telephony services. However, in some countries the ownership of cable networks by telecom companies has

[11] *Ibid at 16*

inhibited their offering of Internet and telephone access as it competes directly with their telecom networks. Many of the convergence trends cited in relation to IT (as opposed to IT services over telecom networks) and broadcasting indicate rather greater levels of integration between content production and distribution and are reflected in the major mergers and acquisitions in the telecom and broadcasting sectors over the last decade, such as the much vaunted and troubled Time Warner and AOL merger.

Although many equipment producers have historically provided services across the different sectors both in production and consumer equipment, there is increasing evidence of convergence of equipment, especially end user terminals, the most advanced of which provide for multipurpose usage from Internet access to video storage.

3.3 Policy and regulatory convergence

While there has been some policy and regulatory integration, especially the mergers of regulatory agencies underway in many jurisdictions across the globe, there are only a few examples of genuinely convergent approaches to regulation of the communications sector. Some of the characteristics of such convergence would be the equal treatment of all infrastructures, services and content irrespective of their traditional sectors. The communications policy in Malaysia has probably gone furthest in developing a truly convergent policy and regulatory framework. It continues to be held up as the finest example of successfully shifting to a new regulatory and licensing paradigm necessary to effectively regulating converged services.

It has organised the sector into four markets and the arising licences issued under this framework are both service and technology neutral. The four categories are Networks, Connectivity, Applications and Content.[12]

Existing licensees who are regulated according to more traditional vertical and separate categories of broadcasting, telecommunications, VANS and ISP licences are being migrated to the more flexible regime. In the interim some restrictions may apply to take into account commitments already made to existing licensees and to ensure an orderly transition.

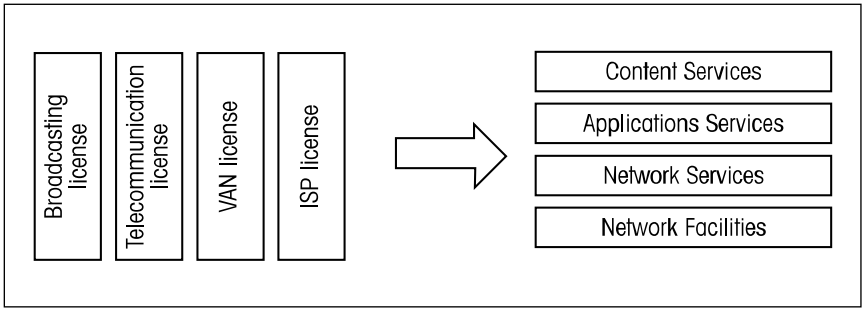
The new licensing framework will not compel a change in the industry structure, though it will facilitate those businesses that are vertically focused to go into horizontal arrangements should they wish to. This would allow a network owner for example to divest certain downstream activities to concentrate on operating the network and providing facilities to former competitors.

To encourage entry into the four markets, only activities with significant economic or social impact are individually licensed.

To encourage entry into the four markets, only activities with significant economic or social impact are individually licensed. Some communications activities are required to apply for class licences which on compliance they automatically received and remaining activities are exempt from licensing.

[12] *Malaysian Communications and Multimedia Commission, 2001, Regulating for Convergence – the future of the regulatory framework, ITU Workshop on Regulatory implications of Broadband, Geneva, May 2001.*

The regulatory environment includes generic provisions arising from the legislation which apply to all activities which fall under the Act. Certain standard licence conditions apply to both individual and class licences. Certain further conditions will apply to all individual licensees, and certain licensees will have special conditions and undertakings relating to their licences.



Source: Malaysian Communications and Multimedia Commission 2001

Malaysia has found that many service providers invest in similar infrastructure to provide commodity type services which result in cost inefficiencies which are passed on to customers and make the entire industry less competitive. A more flexible regulatory regime will lower operating costs, allowing for more competitive tariffs. Less investment in duplicate infrastructure frees capital for customer support, applications and content development and delivers greater dividends for further investment.

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3.4 Convergence or divergence?

The process of convergence, within and across sectors, is accompanied by divergence. What may initially appear as divergent markets though, such as mobile and Internet that have emerged as distinctive market segments may in time converge. New cost effective, easily deployable wireless technology, with potential for mobility, are increasingly being used in traditionally fixed line networks nullifying early regulatory distinctions between fixed and wireless mobile networks. With greater substitutability between mobile and fixed telephony services and the increasing potential of mobile networks to offer data and visual images, and the potential of Internet to offer webcasting services, these services should be viewed as part of the broader convergent market of services offered seamlessly across complementary network components.

In addition for historical and circumstantial reasons, convergence is uneven, globally, nationally and within national ICT sectors. Currently there appears to be far more convergence between the traditionally distinct areas of telecommunications, IT, broadcasting and other media at the top end of the value chain where content production occurs. Convergence at the distribution level is most evident between broadcasting and telecommunications. On the equipment side

there is currently increasing convergence in IT and telecommunications and in IT and broadcasting areas, but separately.

While the focus of policy has been on the convergence of broadcasting, telecommunications and IT, the convergence within these infrastructures and services in this sector allows for convergence of all knowledge and transaction based service industries, including finance, education and health. Understanding the implications of this is critical to developing an integrated policy framework.

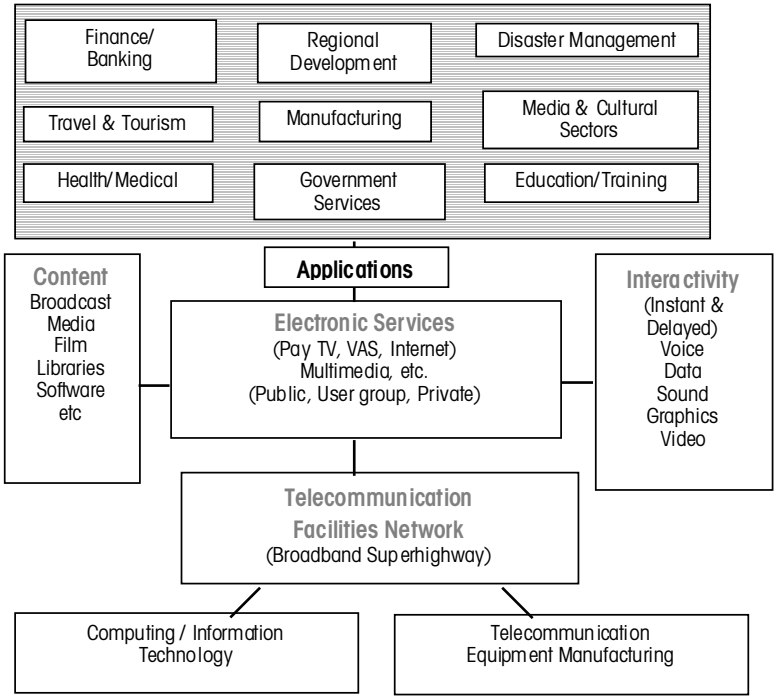
4. Information infrastructure

Development of a national integrated information infrastructure that is globally interconnected provides the backbone of a modern economy. The opportunity cost of not moving as rapidly as possible to developing a dynamic infrastructure and flexible regulatory framework to enable it, is high and likely to perpetuate the digital divide.

The productivity potential of effectively integrated networks and services into all spheres of the economy will allow countries to make the quantum leap required to be leaders in the network economy.

The importance of telecommunications as the communications backbone of other critical services sectors such as banking or emergency services was recognised with telecommunications being one of the first public utilities to be privatised and liberalised with the introduction of competitors. The purpose of this was to secure the necessary capital in order to extend the network to meet the economic and developmental needs of countries and further improve the quality and cost of services through the introduction of competition. This is an ongoing process underway across the globe. Driven by the technological realities of convergence, particularly the Internet, and increasing demand for new competitive services, the narrowband network traditionally underlying voice services, needed to be expanded to provide broadband capacity. The productivity potential of effectively integrated networks and services into all spheres of the economy will allow countries to make the quantum leap required to be leaders in the network economy.

Figure 3 - ICT INFRASTRUCTURE for the E-economy[13]



Source: Melody, W (2002)

Melody points out that there are no clear correlations between the competitiveness of markets and market growth and identifies a number of other factors necessary to transform national and international telecom networks into information infrastructures capable of providing the types of enhanced services needed in the network economy.

These include:

- An expansion of the bandwidth capacity in national and international networks to reduce unit networking costs and provide for high capacity services;
- Expansion of bandwidth for local connections to business and residence users to facilitate the increasing demands for high-speed services.
- Internet services development which helps stimulate demand for new next generation Internet services
- Development of innovative applications of new internet services throughout the economy and society to business, government, education entertainment etc.[14]

[13] *Melody,W (2002)* ***World Telecommunications Markets: International Handbook of Telecommunications Economics****, Vol.111*
[14] *Ibid. p7*

Aggregation of needs for broadband usage at collective usage points will also stimulate take-up of enhanced services, as already evidenced in Africa with inhibiting high cost narrowband access.

While national network investments are being focused in many developing countries on network expansion, preparing for next generation mobile and Internet services offered by convergence present a particular challenge for developing countries. While achieving voice access for its citizenry, many developing countries may become increasingly marginalised in their inability to access the enhanced tools of citizenry and consumer participation needed to participate effectively in the network economy that has developed alongside them.

5. Arising policy considerations for South Africa

The sector specific policy and regulatory framework adopted in South Africa developed in line with the distinct silo nature of industrial economies. The liberalization of the broadcasting and telecommunication sectors over the last 10 years changed the nature of regulation from monopoly self-regulation to competitive regulation required to deal with liberalising markets. This linear developmental approach to policy and regulation reflects the regulatory paradigm of a previous era. The increasingly crosscutting nature of the digital economy requires more integrated and enabling, indeed innovative, approaches to ICT policy and regulation if the promises of convergence are to be applied to the achievement of national developmental goals.

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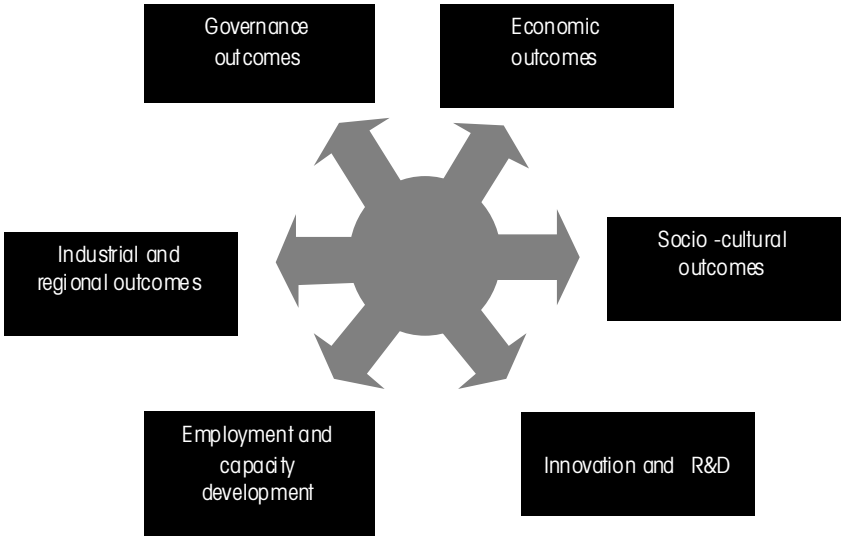
The need for a policy review, and the emergence of policy priorities in the policy formulation process arise both from global pressures and from current failures in the system, or inabilities to deliver on national objectives any longer. The Australian Convergence review identifies three factors that influence policy outcomes in the convergence environment. [15] These include internationalisation, mass customisation and the emergence of new intermediate markets. The most challenging policy response for countries arises when vertically integrated markets combine with increased internationalization. This is the case in South Africa, causing policy priorities in all major outcome areas, many of which are likely to face tensions. The balancing of these tensions without nullifying the gains to be achieved through any single one is the policy challenge South Africa faces.

Broadly, national objectives have not changed but the policies and strategies to achieve them under conditions of structural convergence may be quite different and costs of not creating an environment in which to achieve them in this rapidly evolving environment, may be much higher than the country can afford. The national objectives of various pieces of legislation that affect the communications sectors together with national economic and trade policies can be clustered around the following inter-related outcomes

15 *Australian Review opcit p4*



The approach below seeks to prioritise desired national outcomes and proposes possible points of intervention to achieve them. The points of intervention determine policy options for government, which are in turn determined by socio-economic conditions on the ground more generally and the structure and nature of the industry specifically. However, while Government has a critical role to play in creating an enabling environment with a high level of co-ordination and integration between sectors, its ability to control development under conditions of convergence are greatly reducedThere are essentially three types of intervention strategies: interventions in market activities. These are direct participation; intervention in the market and industry structure such as control on market entry; and intervention in market conduct such as competition rules and other rules of the game appropriate in a converged environment such as rules around privacy, security, intellectual property.[16] Increasingly government intervention to cope with a converged environment will need to move from the first type of intervention mentioned towards the third.

While Government has a critical role to play in creating an enabling environment with a high level of co-ordination and integration between sectors, its ability to control development under conditions of convergence are greatly reduced.

[16] *Ibid p6*

5.1 Economic outcomes

The benefits associated with innovation and technological diffusion in the communications sector are significant from a policy point of view because they flow through the whole economy, impacting on global competitiveness. Perhaps the greatest constraint on convergence gains in South Africa is the current telecom market structure and its associated regulatory framework which remains enmeshed in the analogue logic of telecommunication provisioningStructured around a vertically integrated incumbent, initially with no competition in a monopoly environment but with gradual liberalization, offering services downstream in emerging competitive markets, such a market structure creates artificial regulatory distinctions in a digital environment between potentially convergent networks, services and content. As the economic and technological impacts of convergence increase so vertically integrated market structures create greater contradictions within the digital economy due to the bottleneck power in infrastructure and connectivity industries, prompting the need for more effective economic outcomes. Structural separation of the various market components and the removal of formal and informal barriers to market entry would be more conducive to realizing the benefits of convergence and associated economic efficiencies. A regulatory framework which categorises licences horizontally rather vertically into network, services and applications is likely to be more enabling of convergence trends

Perhaps the greatest constraint on convergence gains in South Africa is the current telecom market structure and its associated regulatory framework which remains enmeshed in the analogue logic of telecommunication provisioning.

A regulatory framework which categorises licences horizontally rather vertically into network, services and applications is likely to be more enabling of convergence trends.

As the service sector becomes more integrated, regulation should focus far more on the impact of competitive behaviour, mergers and acquisitions. This will place particular challenges on regulators who will face often conflicting objectives. For example, while enabling the integration of networks and services to optimise the use of national resources toward becoming more globally competitive they will also be responsible for avoiding concentration of ownership and abuse of market dominance. While vertical disintegration may be increasingly evidenced in the market, existing dominance within the market is likely to prevail for some time. This will continue to require efficient access and interconnection arrangements if the benefits of convergence are to be experienced by users and consumers.

A more fundamental question that arises is to what degree traditional economic regulation should be utilised to deal with intangible assets such as copyrights, technical standards and information databases. [17]

[17] *Ibid p7*

5.2 Socio-cultural outcomes

Traditional definitions of access are constantly being challenged by technological and economic developments. With mobile subscribers in South Africa and on the continent way exceeding fixed line subscribers, traditional definitions of teledensity focusing on fixed access and the notions of basic telecommunications that informed universal access have been challenged. Universal access like other policy and regulatory aspects of a convergence policy will need to be understood as a dynamic concept that will constant require review.

Currently however, caution needs to be sounded against the belief that mobile can take care of communication needs in a digital economy. While limited data and Internet access is available on high-end mobile terminals, the costs associated with online services remain very high and limited. While developments in this regard will require constant assessment, the dangers of closing the gap on basic voice services and extending them with regarding to enhanced services need to be guarded against. While opening up the market to broadband networks and services will contribute greatly to the efficiency and growth of the economy, strategies for providing access to affordable enhanced services to less lucrative market segments will require innovation and flexibility.

While opening up the market to broadband networks and services will contribute greatly to the efficiency and growth of the economy, strategies for providing access to affordable enhanced services to less lucrative market segments will require innovation and flexibility.

This will remain the central public interest issue in the converged environment. Reduction of costs and improvement of quality of services are critical for the information infrastructure essential to effective participation in the network economy. "Policies that are fashioned to address this issue may determine whether the information infrastructure and next generation Internet will provide a catalyst to overcoming the digital divide and thereby a foundation for network based economic, educational, social and other opportunities for developing countries, or whether they will magnify the telecom divide dramatically into an insuperable barrier for those who are not connected."[18]

On the content side, ways of protecting public service and cultural diversity principles that have defined the development of public interest regulation will require special attention in the digital environment. Traditionally regulation has sought both to restrict indecent, obscene or inappropriate content, especially for children, and increase exposure to local content and encourage indigenous and independent production through quotas or incentives. Greater internationalization of service markets can render such regulation ineffective or difficult to enforce, causing higher priorities for social and cultural outcomes. Traditional regulatory mechanisms to enforce national objectives promoting cultural aspirations or setting cultural standards such as prohibiting certain content or setting quotas for local content will become unenforceable as content can be accessed on a range of different platforms.

On the content side, ways of protecting public service and cultural diversity principles that have defined the development of public interest regulation will require special attention in the digital environment.

[18] *Melody, W (2002) Preparing the Information Infrastructure for the Network Economy,* ***World Telecommunication Markets: International Handbook of Telecommunications Economic*** *Vol III, p 11.*

More effective interventions in this environment will take the form of incentives to producers of content through production subsidies and tax breaks. Direct support of local industries is more likely to be successful than traditional quotas that may allow new, similar digital services to compete unfairly with traditional services.

Another policy priority that arises from internationalisation is that of consumer protection. Creating an environment of certainty for consumers appears to be one of the greatest challenges facing internationalized services, without which services will remain domestic or with large, well known brands rather than support potential more innovative or cost effective new services.

5.3 Employment and human capacity outcomes

Increased internationalisation of communication also causes industry development and employment to emerge as a policy priority due to the mobility of financial and human capital. Around the world the success of countries, which are transforming their telecommunications industries into information infrastructures, is attributed to the formation of human, intellectual and social capital.[19]

Around the world the success of countries, which are transforming their telecommunications industries into information infrastructures, is attributed to the formation of human, intellectual and social capital.

Developing policy frameworks that will enable South Africa to be an effective competitor for investment and skills will be critical to successfully responding to global pressures to meet national objectives. Strategies to develop human capital are however unlikely to be appropriate to the digital economy, if devised in a constraining market environment. While various layers of skills and knowledge are required to meet the developmental needs of the country and to become globally competitive, conditions for innovation and entrepreneurialism need to be created.

5.4 Research and innovation outcomes

Such innovation and experimentation requires an alchemy of public and private funding and endeavour, and are unlikely to be successfully incubated in a restrictive policy and regulatory environment.

The ability of South Africa to compete and even survive in the global economy will be determined by the degree to which it is able to optimise technology innovation. Mature economies with large markets have an inherent advantage in the global economy, while smaller countries like South Africa will need to specialize their efforts through the development of R&D and skills development programmes that demonstrate the benefits of digital technologies and their developmental advantage.

[19] *Ibid p8*

5.5 Governance and Institutional outcomes

5.5.1 Changing role of government

While government has a critical role to play in creating an enabling environment in order to reap the benefits associated with convergence, it is not longer able to control developments in the same way it has historically done in the communications sector. Developments are far more likely to be driven by technological and commercial factors. With government increasingly removed from the dynamics of communications provisioning, policy formulation processes require input from all expert resources in society, including operators, non-governmental organisations, entrepreneurs, innovators and academics. For the development of a globally competitive information infrastructure for any country, all available intellectual resources within and outside of government need to be drawn on.

The significance of an independent and legitimate regulator in this increasingly internationalised environment will increase. For this to be achieved in future policy, a clear separation of powers between the Ministry of Communications and ICASA and the removal of the joint-jurisdiction by the Minister and ICASA on the prescribing of regulations and the granting of licences for telecommunications would be required. This would relieve the Ministry of the some of the structural conflicts of interest faced by it as the entity responsible for maximising state assets in the sector while at the same time being responsible for the often contradictory interests of the broader industry and, more recently, being directly responsible for the selection of the PSTN competitor to the incumbent, in which the state is still the largest single shareholder. Other actions that would reduce the structural conflict of interest could be removed by either placing the responsibility for all state assets in the sector including Telkom clearly under the Department of State Enterprises, or as the sector becomes increasingly competitive, making the Department of Trade and Industry responsible for broader sector policy. However, these broader structural changes necessary to assuage this major point of tension within the sector could be removed with the delineation of Ministry and ICASA functions. The requirement that regulations be approved by the Minister has created a serious regulatory bottleneck in the implementation of policy with regulations critical to sector development. The shared licensing responsibilities have also been a source of tension in the industry and allowed interested parties to play one set of decision-makers off against another with all major licences processes to date being highly controversial. In terms of instilling confidence in the regulator within the industry and perceptions of independence in the international investment community, the licensing functions should be located within a skilled, transparent and accountable regulator. The Ministry could still determine the liberalisation agenda through the nature and timing of licences to be granted through the law and the existing mechanism of policy directives.

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The likely outcome of the removal of this critical point of tension in the regulatory framework is that the Ministry, currently burdened by regulatory responsibilities, would be freed up to focus on the policy challenges facing this rapidly

converging sector which underpins the modern economy, while the regulator would be given the powers to deliver on its mandate and earn the legitimacy that would underpin its effectiveness.

5.5.2 Changing role of regulation and regulatory principles

Traditionally Government has determined market structure through either direct participation such as in public broadcasting or telecom provisioning or restricting market entry with the issuance of licences. With liberalisation it has sought to determine market conduct through competition rules or access regulation. A market structure which eliminates or reduces vertical integration, especially in the context of increased internationalisation, often reduces the need for as extensive and resource intensive, intervention in the market. During any transition period from a traditional to a convergence regime, economic regulatory intervention will continue to be required to establish efficient access and interconnection markets to curtail abuse of economic power.

- Equivalent treatment of services and technological neutrality

Within the sector there is overwhelming support for the idea that in principle there should be equivalent treatment of equivalent services, regardless of the delivery medium. As far as possible a technologically neutral position should be adopted by the regulator, especially when services such as voice, data and video were indistinguishable at the level of bits. 20

Regulating similar services differently on the basis of their mode of delivery undermines one of the central practices of best practice regulation, namely technological neutrality.

Regulating similar services differently on the basis of their mode of delivery undermines one of the central practices of best practice regulation, namely technological neutralityTechnology specific regulation has the potential to discriminate against different operators and result in unfair competition. Those in favour of different regulation for similar services on different platforms argue that it is the very medium of delivery that makes them distinctive. It is for this reason that they reach different audiences and, from a fair competition point of view, what differentiates their cost structure and therefore presumably their obligations. This was a minority view.

While agreeing with the idea that equivalent services should be regulated similarly, the broadcasting fraternity also argued that an entirely new approach to broadcasting would be necessary in the digital era, as services did not remain static. A multiplex for example, can shift from 10 services to four in drive-time. In such a complex environment, they proposed that regulation that removes the burden of monitoring compliance from the regulator should be favoured. The specific example cited was the requirement on multiplex licences in the UK, where companies are required to do their frequency planning, which is then approved by the regulator.

The signal distributors and the telecom operators qualified their acceptance of the concept of symmetrical regulation with the proviso that transitional regulation would be needed to deal with any bottlenecks that may occur during the transition.

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20 *Stakeholder interviews conducted for Gillwald, A (2001) ITU Broadband Study: South African Case Study, LINK Centre.*

- Flexible spectrum management

With analogue, it was the very mode of delivery and, specifically, the use of the scarce public resource of spectrum associated with it that justified regulation of certain modes of delivery. It was precisely what was thought to be the finite nature of analogue spectrum that prompted regulation of radio services in the early part of the last century. The prospect of more or less unlimited spectrum offered by digitisation has profoundly undermined one of the major rationales of radio regulations. The need for spectrum regulators to be responsive to new technologies and services, such as WiFi most recently, was regarded as critical to innovation and sector development. Those concerned with the negative impact of the restrictive use of spectrum on innovation and development have argued for a 'spectrum commons' a slice of dedicated spectrum where people can use unlicensed spectrum freely.

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In this spirit, some respondents argued that services should not be regulated at all or should be given "class licences". It was infrastructure that required regulation, some argued, especially to avoid unnecessary duplication. Most importantly, the respondents felt that regulations must be enforceable, and should not negatively impact on business without there being some public interest imperative.

- Flexible ownership and control

Existing legislation, regulations and licences should at the very least be brought into line with WTO commitments, but even compliance with these may inhibit the large scale investment South Africa will need to capitalise network expansion. Despite market access remaining very unreciprocal despite and the likelihood of gaining ownership of American networks in particular remote by foreigners, developing countries have to think far more strategically about securing investment, technology and management skills without losing control of their industry to foreign nationals.

5.5.3 Institutional design

Convergence has been a major driver of the merger of traditionally distinct regulatory institutions into single regulatory agencies. In some cases this has involved simply the physical merger of staff into a single 'one-stop shop for industry'. In other case it is taking longer and involves the complete overhaul of policy and legislative arrangements for a converged environment. This has been prompted by the development of new technologies, which increase the trend towards substitution in the telecommunications industry. Examples of this are the use of packet switching in circuit switching as well as voice over Internet protocol replacing conventional voice telephony. In this way, the data communications industry and the telecommunications industry can be said to be converging. From a regulatory perspective, the higher the possibility of substitution of activity, the greater the likelihood that the term industry will be used over sector.[21]

[21] *Samarajiva R, Mahan A and Barendse, A (2002) Multisector Utility Regulation* ***WDR Discussion paper*** *#0203, p4*

This rationale for merging traditionally distinct communication sectors has been further extended to other traditional public utility areas with the concept of multi-sector regulation. This would result in a single agency that regulates multiple sectors of the economy such as telecommunications, energy, water and transportation. A number of justifications have been made in favour of the establishment of multi-sector regulators. The first is the existence of commonalities in the object of regulation[22]. The strongest argument made here is "rights of way"—the permission granted by government or property owner to install some permanent form of infrastructure such as a road, telephone pole, underground pipe or the like over a stretch of land[23]. Sectors such as telecommunications, energy and transport all require rights of way. The second justification for multi-sector agencies relates to a common use of regulatory skills as well as economies of regulation. With the liberalisation of various sectors - including telecommunications - and with this a concomitant global increase in regulatory activity, regulatory skills are a scarce commodity. Most educational systems are not geared towards the production of such skills, while the prices for persons with such skills, bid up by scarcity, sees them migrating to private sector organisations. A multi-sector agency would have economies of scale in administrative and support services, as well as technical expertise.

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Other justifications for the establishment of multi-sector regulators are that they reduce the risk of "industry capture", because with the establishment of a multi-sector, it will become difficult for lobby groups within any specific sector to influence the regulator. Aligned to this would be the reduction of any risk of "political capture". This it is argued is because a regulator with responsibility for numerous sectors will be less likely to fall under the influence of a single line ministry. The regulator, will also be in a position to create greater regulatory certainty as rulings across a host of sectors, such as price cap regulation and cost accounting rules, are likely to set valuable precedents for potential investors to gauge targeted markets.

There are disadvantages however involved in multi-sector agencies. As South Africa's experience with its telecommunications regulatory agencies, SATRA and the IBA, has shown, there can be problems with merging existing agencies. There is also the challenge of creating a legal framework of greater complexity and for a more complex regulatory agency.

In interviews with industry, government and the regulator, there was widespread agreement that convergence raised new challenges that required new regulatory frameworks.[24] On the other hand, given the enormous organisational restructuring that has taken place under the ICASA Council, it may not be wise to renovate the current institutional design through convergence legislation. That is, while it may be preferable to rationalise disparate pieces of legislation, it may be less prudent to subject the organisation to further restructuring at this time.

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22 *Ibid*
23 *Ibid p8*
24 *Stakeholder interviews conducted for the Review of the Economic Regulation for the Presidency (2003).*

Most respondents agreed that the convergence of regulatory structures in order to deal effectively with a converging communications environment was inevitable. Many argued that while this had started in South Africa with the physical integration of the broadcasting and telecommunications regulators, the regulation of these traditionally distinct sectors would need to be more evolutionary and develop in response to new issues as they came before the regulator. This was not likely to happen by virtue of being in a single institution but would rather depend on changes in technology and consumer responses to these. There was still a strong sense among respondents that content regulation requires a different set of skills from carriage regulation and that these would need to continue to be regulated separately. Most respondents agreed that the establishment of a single institution made sense from an efficiency stand-point. However, it was vital to ensure that within the merged entity there exists a sufficient body of operational expertise for all relevant service types.

Perhaps more important and more challenging than the physical integration of these historically distinct agencies, however, is the philosophical development of a new regulatory approach that is much more all-encompassing than those of its predecessors. Effective regulation in the era of convergence will require greater flexibility and imagination than ever before, if the benefits of the new technologies are to ensure equity in service provision, yet not stifle innovation and investment.

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5.5.4 Global e-governance

Co-operating at the global level may also allow countries to co-ordinate international efforts to protect consumers and create the levels of trust that will be required for international services to compete effectively and be used optimally.

Internationalisation of services has resulted in core aspects of decision-making being transferred from the sovereign national level to the global level, with regulatory frameworks emerging from multilateral organisations with which national frameworks need to conform. In order to operate international services effectively and evidence genuine reciprocity in terms of market access and treatment in foreign domestic markets, co-operation with multilateral agencies and actively influencing their agendas is far more likely to meet national objectives than reacting defensively to multilateral developments and restricting national participation in such international fora.

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5.5.5 Regional harmonisation

Effective participation in global fora and determination of agendas and international outcomes is far more likely through regional blocs such as the Southern African Development Community. This will require moving beyond the current rhetoric or even high-level protocols officially binding countries to sustained collaboration on international participation including resource and information sharing for international meetings and subsequent implementation or enforcement.

Regional harmonisation is also essential to economic participation and competitiveness for any smaller country such as South Africa in the global economy. The benefits of convergence are realized in scope and scale and ability of services to be offered seamlessly across diverse infrastructure. The cost-effectiveness of digital communication will be enhanced greatly by the harmonisation of policies and practices within the region that create larger and more attractive markets for investors, with the associated benefits for users and consumers

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5.6 Transitional arrangements

As the significant policy shift, together with the dramatic restructuring of the market, required to better enable South Africa to optimise the benefits of convergence will need some time to effect, strategies to deal with the transition will need to be devised. In addition even as structural changes occur legacies of market dominance will remain. Economic regulation expertise will be required whether within sector specific regulators or a multi-sector regulator or a competition authority for some time to come. For this reason the current capacity of regulatory agencies and the legislative constraints on their effective regulation of the emerging converged market should continue to be a national priority.

There are a number of interventions that government can make immediately in the current policy and regulatory framework that would remove the inhibiting effects on the development of the ICT sector. A major area of inefficiency in the market and tension resulting in costly legal disputes arises from the restrictions current policies place on the market in relation to the artificial distinction between voice and data and Voice over Internet Protocol (VoIP). In a digital environment there is no difference between voice and data traffic on a network and this distinction undermines the benefits and efficiencies associated with digitisation and is counterproductive, given the billions of Rands spent by the country's operators to digitalise there networks. The reason behind this policy constraint is to secure the revenues of network operators thereby providing funds for the extension of their networks and contribution to the achievement of universal service. As has been demonstrated by the lack of delivery by Telkom in relation to universal service, and as recently alluded to by the Director General of Communications in the media, these restrictive market structures are simply placing a drag on market growth, network expansion and alternative ways of connecting citizens. [25]

The statutory constraint on the provision of voice services by service providers such as VANS and ISPs who have to compete against operators in the VANS market such as Telkom, who are able to offer non-competitive voice services through their PSTN licence in a relatively integrated package, undermines the benefits of introducing competition in the sector by preventing some players from competing fairly and as a result has been the further basis of much of the disputes and complaints before the regulator and the courts. Besides the negative

[25] *Bidoli, M, Financial Mail, May 2002*

economic impact that voice and data separation is having on the market and the unproductive burden they are placing on the regulator, due to the artificial nature of their separation in a digitised environment, infringements are actually impossible to detect and enforce.

Besides the negative economic impact that voice and data separation is having on the market and the unproductive burden they are placing on the regulator, due to the artificial nature of their separation in a digitised environment, infringements are actually impossible to detect and enforce.

International experience further suggests that the removal of voice restrictions and the introduction of resale and self-provision of facilities by service providers and other network operators requiring fixed links is also unlikely to dramatically threaten the revenues of the incumbent or the SNO. While some self-provisioning may occur, by and large it is not cost effective for other operators and service providers to self-provide and service providers are typically more concerned with accessing Telkom's facilities at cost based prices. Rather than diminishing their business, with the correct market incentives and regulatory framework, including a choice of facilities providers such as the SNO and Sentech, the network operators can be induced to encourage access to their networks and facilities and increase the wholesale aspects of their business, avoiding the unnecesary duplication of infrastructure and creating strong revenue streams.

To optimise the existing capacity the various networks in the country and to drive down the prices to more competitive global levels, all restrictions on facilities provisioning should be lifted. This would free up Sentech, Eskom and Transtel , whose currently under-utilised networks have been capitalised with public funds, immediately to provide facilities to any service provider. This would also relieve the pressure to licence an arguably inadequate SNO bidder. Ideally these carrier networks should not be permitted to compete with these service providers to ensure the same problems of anticompetitive behaviour associated with vertically integrated entities, does not arise here again. However, even under the existing rules which perpetuate vertical integration in the market with the SNO, at least the choice of three or four facilities providers would allow for some competition in the market and incentives to provide facilities to providers in the competitive arena other than themselves.

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Implementation of such proposals would allow ICASA to divert its resources from the negative regulation they have been compelled to engage in as a result of the of the complaints and requests for rulings that have resulted from these contested areas and focus on more positive regulation that will enable sector growth. They would improve the structural independence of the regulator and improve its delivery, allowing it to achieve credibility both within government and the industry and considerably reduce the regulatory risk to investors. This resource intensive regulatory approach arising from such market structures places an enormous regulatory burden on any country seeking to implement it and requires expensive and skilled regulatory machinery to operate effectively. Countries with far more experience in regulation and with far greater skills and finances than South Africa have struggled, and continue to struggle, to implement access regulation successfully.

These changes are also unlikely to impact as dramatically on the revenues as anticipated by the incumbent, as by and large, service providers and other operators are more keen to focus on their core business and acquire cost based facilities from Telkom. With the correct policy and regulatory environment Telkom could generate a strong revenue stream from the wholesale provision of facilities.

In terms of the law all that is required to remove this area of conflict, is that the Minister declare a date for all restrictions on self-provisioning and resale to be removed. Another legal amendment that would alleviate the pressures on the regulator, are the restrictions on the offering of voice and VOIP by service providers. Lifting this distinction between voice and data would remove the current constraints on the organic development of the market toward integrated voice and data services which currently have to be artificially separated, creating inefficiencies in the market and due its lack of technical enforceability, unproductive regulation. Government's recent acknowledgement of the need to remove inhibiting restrictions on the market should be welcomed in this regard.

The benefits to realising the value of state assets or attracting once off investment in the sector has to be weighed against the negative impacts the accompanying restraints on the market have on the broader sector and its long-term ability to fulfil its critical role in the global economy.

The reasons for imposing these restrictions, namely to optimise state assets and attract investment, have been overtaken by the technological developments and the effects of the global telecom recession on investment. The benefits to realising the value of state assets or attracting once off investment in the sector has to be weighed against the negative impacts the accompanying restraints on the market have on the broader sector and its long-term ability to fulfill its critical role in the global economy

6. Conclusions

Policy reviews arise out of the inability of existing policies and practices to deliver anticipated national outcomes any longer. Stated visions of an information society and knowledge economy for South Africa will not be realised by policy that fetters the organic development of technologies and markets and stifles innovation with artificial restrictions on services. Nor will it result while resources of the regulator are depleted on the unproductive disputes arising from these legal constraints or where governance and institutional arrangements lack credibility. To build the national information infrastructure needed to operate a network economy that can be globally competitive, will require a restructuring of the market from its currently vertically integrated silo structure to a more horizontal structure to optimise the benefits of a convergent environment.

The licensing framework arising from this structure will need to separate out the different layers of the value chain to reflect the horizontal market structure and regulate them according to their economic impact. The main categories of licences could be divided into network or facilities licences, services and applications and content. A more flexible licensing regime based on the socio-economic impact or the licence should be introduced. This would mean that some

activities would require no more than notifications or registrations with the regulator having complied with class rules while others that have wider impact would have greater rights and offerings. A flat licensing regime with three or four layers will place far less regulatory burden on the sector and should create less anti-competitive incentives. A reduction in the regulatory burden will allow regulatory resources to be allocated to inducing investment for network rollout, encouraging service innovation to improve consumers choice and quality, developing market efficiencies, and effectively targeting subsidies, which will continue to be needed in developing countries for some time, at those who most need them. New policy must avoid unnecessary duplication of infrastructure and encourage the integration of existing networks to optimise existing capacity and encourage fair competition that will drive down costs so that services become more widely affordable and increase demand so that operators have economic incentives to expand the coverage of their networks and services.

Governance of the converged sectors will need to draw on all available national expertise, public and private, to develop the best national policies and to be effective in global governance agencies where rules of engagement in the global information infrastructure are being determined. To be credible in these multilateral fora, to induce foreign and local investment and most importantly to effectively regulate this increasingly vital sector of the economy, institutional arrangements will need to enable the unfettered regulation of the sector according to national objectives. The actual design of the regulatory institution will arise from the emergent regulatory demands, the legacy needs and the capacity available to make it effective.

While the market structure and arising regulatory and institutional arrangements are critical to the central of a national information infrastructure accessible and affordable to all, the most critical ingredients to the development of a knowledge society are human, intellectual and indeed social capital. A national information infrastructure will not arise without the public sector capacity to develop appropriate policies, to implement them effectively, or to regulate the market efficiently. Nor will it arise without citizens and consumers with the skills to utilise their access to it nor without innovators and entrepreneurs to devise ways of getting it affordably to the remotest parts of the country or to compete in global markets. This diverse range of success factors together with the crosscutting impact of convergence policy on the economy and society require that any such initiative needs to be part of a broader integrated ICT policy ensuring co-ordination between arts and culture, science and technology, education, trade, finance policies and strategies at the highest level. This has been the common success factor in successful jurisdictions.

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